ERTH POWER

February 14, 2025

BY RESS and EMAIL
registrar@oeb.ca

Ms. Nancy Marconi
Registrar
Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4

Dear Ms. Marconi:

Re: ERTH Power Corporation ("ERTH): ICM Request New Administrative & Operational Facility (EB-2024-0021)
Technical Conference – Undertaking Responses

Please find enclosed ERTH Power's responses to Undertakings JT1.1-JT1.14 pursuant to Procedural Order No. 4 issued on January 22, 2025.

ERTH is filing with the Ontario Energy Board ("**OEB**") certain information in these undertaking responses that is confidential. ERTH is hereby requesting confidential treatment of the information in the table below pursuant to sections 10.01 and 10.02 of the OEB's Rules of Practice and Procedure (revised March 6, 2024) and sections 5.1.1 and 5.1.2 of the OEB's Practice Direction on Confidential Filings (revised December 17, 2021, "**Practice Direction**").

Reference	Reason for Confidentiality
JT1.12 Page 1-2	Section 5 – Presumptively Confidential The information included in Undertaking JT1.12 is presumptively confidential as it includes unit pricing and billing rates of an independent third-party design consultant. Specifically, it shows what assumptions are used by this consultant in generating its cost estimates to provide consulting services to potential and current customers. These market unit prices and billing rates are proprietary and should not be disclosed publicly. The confidential information also relates to commercially sensitive billing rates for overdue invoices.

	Section 5 – Confidential Information In the event the OEB finds the redactions are not presumptively confidential, ERTH submits the redactions are confidential in any event. Disclosure of the rates used by the consultant will harm the consultant and be prejudicial to its competitive position in the market as competitors will be able to access assumptions, unit pricing and billing rates used by the consultant. This may be used by competitors to inform their bids in future tendering and ultimately negatively affect ratepayers by reducing competition in consulting services. Disclosure of this information could also be expected to produce a significant loss for the consultant as competitors would have full knowledge of bidding and pricing strategies of the consultant.

Please contact the undersigned for any questions or concerns.

Sincerely,

Graig Pettit
Vice President & General Manager
Graig.Pettit@erthpower.com

cc: EB-2024-0021 Parties

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RESPONSES TO UNDERTAKING FROM SCHOOL ENERGY COALITION

Undertaking JT1.1:

TO PROVIDE AN UPDATED ICM MODEL AND UPDATED BILL IMPACTS BASED ON UPDATED COST.

Transcript Reference:

	Page #	Line #
From	28	19
To	30	13

Response:

Please find updated ICM models attached as:

- JT1.1_ICM_Model_ERTH_Main_Updated_20250214; and
- JT1.1_ICM_Model_ERTH_Goderich_Updated_20250214.

The following tables below present updated bill impacts specific to ERTH Power's ICM request. Note that, as explained in Staff-12, ERTH Power has provided an estimated payback period of 14 years for the solar investment, based on an estimated $110,400 in electricity savings annually. This annual operational savings for the benefit of ratepayers will not be possible for a "conventional building".

Additionally, as explained by Mr. Pettit during the technical conference, the use of a geothermal system instead of an air sourced heat pump allows the equipment to heat the building to be sized smaller, resulting in both capital savings, but also ongoing operations and maintenance savings (Transcript, page 9, lines 11-28). This is because the geothermal system exchanges thermal energy from a consistent ground temperature year-round, rather than dealing with the significant temperature variations (and decreases in efficiency) of an air source heat pump. Similarly, the OM&A savings arise because, as explained by Mr. Pettit, the heat pump system is four times more efficient than a conventional gas system (Transcript at page 10, lines 1-3). All of these OM&A savings will accrue to the benefit of ratepayers as a result of proposed OM&A Cost Variance Account.

Main Rate Zone ICM Bill Impacts

ICM Rate Rider Bill Impacts	Distribution Bill	Total Bill	ICM Rider Revenue	Distribution Impact	Total Impact
RESIDENTIAL	37.56	137.87	6.40	17.04%	4.64%
GENERAL SERVICE LESS THAN 50 kW	60.60	325.35	10.37	17.11%	3.19%
GENERAL SERVICE 50 TO 999 kW	509.49	10,382.20	86.86	17.05%	0.84%
GENERAL SERVICE 1,000 TO 4,999 kW	5,389.11	130,124.15	918.82	17.05%	0.71%
LARGE USE	40,324.06	593,820.05	6875.08	17.05%	1.16%
UNMETERED SCATTERED LOAD	16.18	42.68	2.77	17.09%	6.48%
SENTINEL LIGHTING	25.31	41.74	2.73	10.79%	6.54%
STREET LIGHTING	30.62	133.18	5.23	17.06%	3.92%
EMBEDDED DISTRIBUTOR	4,350.76	17,780.15	741.79	17.05%	4.17%

Goderich Rate Zone ICM Bill Impacts

ICM Rate Rider Bill Impacts	Distribution Bill	Total Bill	ICM Rider Revenue	Distribution Impact	Total Impact
RESIDENTIAL	39.71	135.73	6.30	15.87%	4.64%
GENERAL SERVICE LESS THAN 50 kW	65.16	316.35	10.32	15.84%	3.26%
GENERAL SERVICE 50 TO 999 kW	545.95	10,734.63	86.64	15.87%	0.81%
GENERAL SERVICE 500 TO 4,999 kW	4,247.25	134,846.78	674.06	15.87%	0.50%
LARGE USE	43,632.05	710,601.26	6924.96	15.87%	0.97%
SENTINEL LIGHTING	44.21	4,136.90	7.02	15.88%	0.17%
STREET LIGHTING	19,450.16	25,466.24	3086.99	15.87%	12.12%
UNMETERED SCATTERED LOAD	98.21	126.44	15.59	15.87%	12.33%

RESPONSES TO UNDERTAKING FROM SCHOOL ENERGY COALITION

Undertaking JT1.2:

TO FILE THE POWERPOINT PRESENTATION WITH A REVIEW OF PROPERTIES AND BILL IMPACTS.

Transcript Reference:

	Page #	Line #
From	30	14
To	33	16

Response:

A PowerPoint presentation with a review of properties and bill impacts is provided as *Attachment 1: PowerPoint Presentation with a Review of Properties and Bill Impacts*.

In recent years, ERTH Power staff identified several deficiencies at its 143 Bell Street facility and inefficiencies associate with its multiple operational locations in the southern portion of its discontinuous service area. Addressing these issues was deemed critical to ensuring ERTH Power's long-term sustainability and efficiency. During management strategic planning discussions in June 2022, discussions highlighted the need to resolve these concerns, noting that the 143 Bell Street facility had reached the end of its useful life.

To explore potential solutions, ERTH Power presented a PowerPoint at a Board of Directors strategy meeting held on September 12–13, 2022. The presentation outlined the concept of constructing a new facility at 277–287 Ingersoll Street in Ingersoll, ON. This high-level review assessed potential billing and financial impacts, based on an estimated construction cost of $15 million (excluding financing costs and furnishings) and a land acquisition cost of approximately $3 million for a five-acre site. Following this meeting, the Board supported initiating land negotiations with the property owner.

However, at the October 2022 Board meeting, the CEO reported that management did not recommend proceeding with the purchase of 277–287 Ingersoll Street. The seller was seeking $6,388,000 - an artificially high transaction price based on Burlington property comparators. As reflected in the following excerpt from the minutes of the October Board meeting, the Board agreed to discontinue negotiations and directed management to

continue exploring alternative options. Included below is an excerpt from the Board Meeting minutes:

> (b) Ingersoll Street Property Purchase
>
> CW provided the Board with an update on the Ingersoll Street property purchase. CW met with Tetra-Chem and learned that the asking price is more than expected at $6.4 million. This price does not align with local real estate pricing. CW recommends that ERTH sit on it and continue to look at other options. McLaughlin brothers may have some options available. There may be other options near the 401 that are yet to be developed. There is another 12 acres for sale behind CAMI on Robinson Road for approximately $4.5 Million that may be an option. There are a few irons in the fire that we can explore. CW's recommendation is to proceed with the business plan and start working on some conceptualized drawings (not engineer drawings).

On February 16, 2023, a new proposal was presented at a Board meeting regarding the property at 385 Thomas Street in Ingersoll, after it was discovered that the owner was open to selling a portion of its 14-acre property. The Board supported pursuing this purchase, citing the location and price as superior to the previous option. Management subsequently negotiated terms with the seller, contingent upon severance, zoning approvals, environmental assessments, and approvals from the shareholder and the conservation authority.

RESPONSES TO UNDERTAKING FROM SCHOOL ENERGY COALITION

Undertaking JT1.3:

TO FILE THE SPECIFICATIONS INFORMATION PROVIDED TO POW ENGINEERING.

Transcript Reference:

	Page #	Line #
From	37	8
To	38	22

Response:

The specifications information provided to POW Engineering are provided as *Attachment 2: Requirements Document – 385 Thomas St New Build.*

As part of the initial consultation for the new build at 385 Thomas St, ERTH Power provided an exhaustive requirements document to POW Engineering and JPM Architects. These specifications were derived from site visits to similar operational and administration buildings as plans were developed to provide input into the design of an effective and efficient utility hub. These specifications were also detailed in Mr. White's reply during the Technical Conference from Page 37 line 14 to page 38 line 14.

In going through the engineering and design phase for the new build, and prior to providing the requirements document, ERTH Power sought opportunities to keep the costs of the new build down. Many of these option removals were noted in Mr. White's reply during the Technical Conference from page 40 line 6 to page 45 line 7. A summary is included below:

- Contemplation of a 2-story office admin facility reduced the land requirement from 7-acres to a 6-acres and resulted in a $900k savings/acre;
- 2-story design for the office admin portion is considered generally cheaper to build and ERTH estimates a greater than $500k savings;
- Removal of the 3-story ready requirement;

- Removal of the precast concrete wall system requirement, opting for a block wall system, which is cheaper and more energy efficient;
- Removal of the requirement for a block wall around the back-exterior portion of the building from floor to ceiling, opting to stop the blocking at window height;
- Choosing not to over engineer to a higher standard (extreme wind and tornado events) as the building will not be used as a community gathering centre;
- Reduction of fleet warehouse space from 120' wide to 100' wide, saving approximately $700k;
- Choosing a 2-door option in the fleet storage area (1 in door and 1 out door system), lowering capital costs and ongoing maintenance cost;
- Removal of a raised floor in the server room requirement, resulting in $20k in savings;
- Choosing a smaller and slower elevator resulting in $20k in savings;
- Removal of the requirement for an industrial hood fan for the stove;
- Reducing generator sizing requirement to support 75% of facility load rather than 100%;
- Change to a horizontal geo field rather than a vertical geo field, resulting in $100k in savings; and
- Selecting materials that provided an optimal balance between cost effectiveness, durability, low maintenance, and locally sourced construction trade friendly.

ERTH Power estimates an approximate savings greater than $2M from the above changes to and deletions from the requirements for the new facility, thus demonstrating prudency in the decision making.

RESPONSES TO UNDERTAKING FROM SCHOOL ENERGY COALITION

Undertaking JT1.4:

TO CONFIRM FIGURES FOR TOTAL PRICE AND BILL IMPACTS PRESENTED TO ERTH SHAREHOLDERS FOR THEIR 2024 APPROVAL.

Transcript Reference:

	Page #	Line #
From	48	11
To	50	28

Response:

The figures for total price and bill impacts presented to ERTH Shareholder for their 2024 approval on February 15th 2024 are as follows:

New Class C Estimate, excluding HST		Interest	Total
Building	20,128,943	803,290	20,932,233
Includes $1.5M contingency			
Solar	1,200,000	47,889	1,247,889
Ground Source Heat Pump	3,000,000	119,722	3,119,722
Engineering fees	1,506,000	60,100	1,566,100
	25,834,943	1,031,000	26,865,943
Furniture	872,000	-	872,000
Land	5,525,000	720,000	6,245,000
	32,231,943	**1,751,000**	**33,982,943**

Total bill impacts presented to ERTH Shareholders were 5.3% based upon an average residential customer using 750 kWh's per month or an increase of $5.50.

The shareholder approved proceeding with the plan as presented, and delegated the final go/no go decision to the Board of Directors (within a tolerance band) utilizing the

results of the final RFP process. The results of the RFP was approximately $100,000 less than the estimate above that was presented to the Board and Shareholder.

RESPONSES TO UNDERTAKING FROM SCHOOL ENERGY COALITION

Undertaking JT1.5:

TO FILE, IF AVAILABLE, ANY INTERNAL RENDERINGS FOR THE NEW FACILITY.

Transcript Reference:

	Page #	Line #
From	51	17
To	52	4

Response:

Internal renderings for the new facility are provided in *Attachment 4: Internal Renderings*.

RESPONSES TO UNDERTAKING FROM SCHOOL ENERGY COALITION

Undertaking JT1.6:

TO FILE THE POWER ADVISORY STUDY.

Transcript Reference:

	Page #	Line #
From	69	20
To	70	17

Response:

THE Power Advisory Study is provided in *Attachment 4: DER/CDM/NWA Review.*

RESPONSES TO UNDERTAKING FROM SCHOOL ENERGY COALITION

Undertaking JT1.7:

WITH REFERENCE TO THE PROPERTIES SHOWN IN SEC 12, TO SHOW THE BENCHMARKING CALCULATION AND HOW IT WAS ESCALATED; AND TO COMPARE IT IN 2025 DOLLARS.

Transcript Reference:

	Page #	Line #
From	71	20
To	72	28

Response:

As shown on pages 71 and 72 of the February 6, 2025 Technical Conference transcript, School Energy Coalition requested ERTH Power demonstrate how the Combined Inflation: Buildings and Land Index ("Index") was applied to the facility peer group, by providing an example calculation based on one of the facilities.

The Index was provided in response to interrogatory SEC-12 a), as reproduced below:

Combined Inflation: Buildings & Land	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Custom Index	1.00	1.07	1.11	1.14	1.18	1.20	1.26	1.31	1.38	1.42	1.51	1.80	2.04	2.12	2.18
Growth	0.0%	6.8%	4.4%	2.5%	3.2%	2.1%	4.7%	3.8%	5.2%	3.2%	6.4%	19%	12.9%	4.1%	3.0%
Cumulative Growth	0.0%	6.8%	11.5%	14.3%	18.0%	20.4%	26.1%	30.9%	37.7%	42.1%	51.2%	80.3%	103.5%	111.9%	118.3%

As shown above, the Index spans the period of 2011 through to 2025, capturing the earliest facility in the peer group (Waterloo North Hydro in 2011) and ERTH Power's proposed facility, with an in-service date in 2025. Actual growth in building and land costs for each year (as shown in the row titled "Growth") are used to derive a Custom Index value which is established as 1.00 in 2011, and escalated by inflation up to 2025. The difference in Custom Index values between the in-service year of a peer facility and the

year 2025 is used to escalate OEB-approved capital expenditures for the purpose of comparison. The calculation can be expressed as follows:

- Inflation Adjusted CAPEX = OEB Approved CAPEX * (2025 Custom Index / In-service Year Custom Index)

To provide an example, the InnPower facility examined in EB-2014-0086 was approved at $10.3M in capital expenditure with an in-service year of 2015. When escalated to a 2025 equivalent capital expenditure, this value is $19.1M, as shown below:

- $19.1M = $10.3 * (2.18 / 1.18)

RESPONSES TO UNDERTAKING FROM SCHOOL ENERGY COALITION

Undertaking JT1.8:

TO PROVIDE AN UPDATED COST PER SQUARE FOOT WITH A CONVENTIONAL HEATING SYSTEM, ALL IN ONE TABLE; TO PROVIDE A COMMENT ON THE DECISION IN EB-2014-0086 WITH RESPECT TO NON-UTILITY SQUARE FOOTAGE AND NON-UTILITY COSTS, AND WHETHER THAT WILL RESULT IN ADJUSTMENTS TO THE INNPOWER ENTRY IN THE TABLE.

Transcript Reference:

	Page #	Line #
From	73	1
To	74	16

Response:

Below is a table with calculations for cost to construct per square foot including ERTH with a solar installation and geothermal and he calculations without the incremental costs of the solar panel system and the incremental costs of the Geothermal system of $1,500,000 and $300,000 respectively.

	Algoma	Milton	Waterloo	InnPower	ERTH Solar & GEO	ERTH Conventional
Adjusted Cost ($000)	$ 15,361	$ 24,594	$ 57,839	$ 19,129	$ 33,439	$ 31,639
Square Footage	41,703	91,828	104,000	36,712	57,170	57,170
$/Square Foot	$ 368.34	$ 267.83	$ 556.14	$ 521.06	$ 584.90	$ 553.42

On review of the OEB approved settlement proposal in EB-2014-0086, the capital expenditure reduction applied to InnPower's facility appears to have specifically contemplated excess square footage beyond the needs of the regulated utility, further noting portions of the building planned for lease. As such, it would be inappropriate in ERTH Power's view to adjust the InnPower figure only to reflect the full square footage of the building, given the capital adjustments related to those non-utility spaces. This said,

ERTH Power cannot be certain of all factors weighed in determining the capital adjustment made, or how those factors proportionately impacted the capital adjustment. For completeness, ERTH Power provides the following figures, which compare the total InnPower building square footage against the unreduced capital cost of the facility:

- Adjusted Cost ($000): $24,512
- Square Footage: 41,802
- $ / Square Foot: $586.39

RESPONSES TO UNDERTAKING FROM SCHOOL ENERGY COALITION

Undertaking JT1.9:

WITH REFERENCE TO SEC-12D, TO PROVIDE A BREAKDOWN OF SHARED-SPACE SQUARE FOOTAGE ALLOCATION, FOR REGULATED VERSUS UNREGULATED BUSINESSES.

Transcript Reference:

	Page #	Line #
From	79	10
To	80	2

Response:

Please see below the breakdown of regulated and unregulated square footage which underpinned the Business Plan provided as Attachment 12 to SEC-1, as well as the facility benchmarking presented in ERTH Power's application and evidence. The table below presents the allocation of shared space on the basis of proportionate space directly allocated to the regulated and unregulated businesses.

ft2		%
36,753	ERTH Power: Directly Allocated ft2	89%
4,752	ERTH Corp/Holdings: Directly Allocated ft2	11%
13,871	ERTH Power: Share of Common Space	89%
1,794	ERTH Corp/Holdings: Share of Common Space	11%
50,624	ERTH Power Total	89%
6,546	ERTH Corp/Holdings Total	11%
57,170	**Total ft2**	**100%**

For clarity, the values presented were prepared prior to the finalization of any rental agreement between ERTH Power and its affiliates, and do not necessarily reflect the final square footage which will be rented at the facility.

RESPONSES TO UNDERTAKING FROM SCHOOL ENERGY COALITION

Undertaking JT1.10:

TO PROVIDE A BREAKDOWN FOR THE BASELINE O&M VARIANCE ACCOUNT SHOWING BUILDING, CLEANING, COURIER, INSURANCE AND PROPERTY TAX COSTS.

Transcript Reference:

	Page #	Line #
From	80	12
To	84	19

Response:

ERTH has provided a 3-year average 2022-2024 and added 2025 IRM increase as the baseline O&M Variance Account.

The following chart provides the detailed O&M costs, excluding rent, for the 2025 base year in the amount of $315,164

Bell and Aylmer Combined O&M Costs	2022 - 2024 average	2025 3.3%
Building R&M	29,187	**30,150**
Cleaning	60,307	**62,297**
Courier	1,550	**1,601**
Ground maintenance (grass/snow)	22,357	**23,095**
Insurance	13,171	**13,606**
Property taxes	41,114	**42,471**
Rent *		
Telephone/Internet	26,785	**27,669**
Utilities	-	-
Gas	15,646	**16,162**
Gas accrual error	-	-
Electric	27,087	**27,981**
	-	-
Waste management	19,255	**19,890**
Amortization - Leaseholds, Furn and Fixtures	-	-
Leaseholds	48,637	**50,242**
Furniture		
	305,096	**315,164**

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RESPONSES TO UNDERTAKING FROM VULNERABLE ENERGY CONSUMUMBERS COALITION

Undertaking JT1.11:

TO FILE BRONNENCO'S MOST RECENT CONSTRUCTION SCHEDULE/GANTT CHART.

Transcript Reference:

	Page #	Line #
From	89	17
To	90	19

Response:

Bronnenco's most recent construction schedule/GANTT Chart is filed as *Attachment 6: Bronnenco Construction Schedule.*

As detailed in the updated project plan ERTH Power will be taking occupancy of the new facility in December of 2025 which is consistent with the plan as submitted and updated in the interrogatory process.

RESPONSES TO UNDERTAKING FROM VULNERABLE ENERGY CONSUMUMBERS COALITION

Undertaking JT1.12:

TO PROVIDE DETAIL ON REDUCED PRICING (FILED CONFIDENTIALLY, AS REQUIRED).

Transcript Reference:

	Page #	Line #
From	99	9
To	100	5

Response:

To provide clarity on the reduced pricing for design and engineering services, ERTH Power has included the Royal Architectural Institute of Canada's guide for determining appropriate fees for architectural services as *Attachment 6: RAIC Guide*, along with the calculations conducted by Pow Engineering as Attachment 7: *Fee Calculation Sheet*. These calculations established that 10.68% is considered the standard percentage for a contract of this nature. However, ERTH Power engaged Pow Engineering at a reduced fee of [redacted] for architectural services, representing a cost savings of [redacted] compared to the standard rate.

Consistent with Appendix B of the Practice Direction on Confidential Filings, ERTH has redacted the billing rate used by POW Engineering (as well as calculations that can be used to reverse calculate the billing rate), which is presumptively confidential within the meaning of the practice direction. Disclosure of this information could result in potential harm including prejudice to Pow Engineering's competitive position, including the potential to produce a significant loss to Pow Engineering or a gain to its competitors.

The following is an excerpt from the contract that further supports the information being requested within this undertaking:

Fee and Professional Services Deliverables

RAIC Guide to determining fees recommendation for a project of this size and complexity is 10.7%, including Architectural, Civil, Structural, Mechanical and Electrical Engineering.

Building on the existing design concept work we have completed; our design team is ready to commence the next phase of the project immediately upon approval.

Our design team's proximity to the site including Allan Avis Architects and Chorley + Bisset is an important component for servicing the project and the ability to react promptly to issues that may arise. This is reflected in our ability to keep our fees lower. Our experience with the level of finishes and complexity of the project allows our design team to control our costs. Our office operating as the lead is also valuable from the perspective of experience and knowledge of the Town of Ingersoll and the County of Oxford specifically. This building will potentially be a one in a hundred-year build and should reflect the heritage and history of the Town. Local knowledge will be a valuable addition to the project.

Construction Budget (less contingency) $17,721,000.00 [redacted]
The fee is broken down as follows:

Project Phase	% of Work	Fee
Construction Documentation	[redacted]	[redacted]
Bidding		
Contract Administration		
Post Construction		
Totals	100%	

Fees above are exclusive of H.S.T. and will be invoiced monthly on a percentage of completion basis. Accounts in excess of 30 days are subject to a [redacted] interest charge.

Reimbursable expenses will be invoiced separately to fees noted above.

Should you require further discussion in the above regard, please do not hesitate to contact our office.

Yours truly,

POW PETERMAN
Consulting Engineers

Chris G. Willie, M.A.A.T.O., CAHP
Associate
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David Pow, Pow Engineering david.pow@pow.ca
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RESPONSES TO UNDERTAKING FROM SCHOOL ENERGY COALITION

Undertaking JT1.13:

TO PROVIDE A CALCULATION OF THE FULLY ALLOCATED MARKET COSTS FOR THE AFFILIATES USE OF THE NEW FACILITY.

Transcript Reference:

	Page #	Line #
From	113	9
To	113	20

Response:

Please see the table at the end of the response that provides the breakdown of the fully allocated rental rate of $21.62 per sq foot.

The fully allocated cost approach provides annual rental revenue of $39,543.

ERTH has proposed a market rate of $25.00 per sq ft, resulting in annual rental revenue of $46,950

Affiliate rental rate - fully allocated cost approach		
New facility cost per sq foot		585
Rental sq footage		1,829
Total cost		**1,069,965**
UFL	55	
Amortization		19,454
Amortization per sq foot		**10.64**
Forecasted 2026 OM&A expense		628,000
Total square feet	57,170	
OM&A per sq foot		**10.98**
Total cost per sq foot		**21.62**
Market approach		**25.00**

RESPONSES TO UNDERTAKING FROM THE ONTARIO ENERGY BOARD

Undertaking JT1.14:

TO PROVIDE DATA FOR 2023 LOSS CARRY-FORWARDS

Transcript Reference:

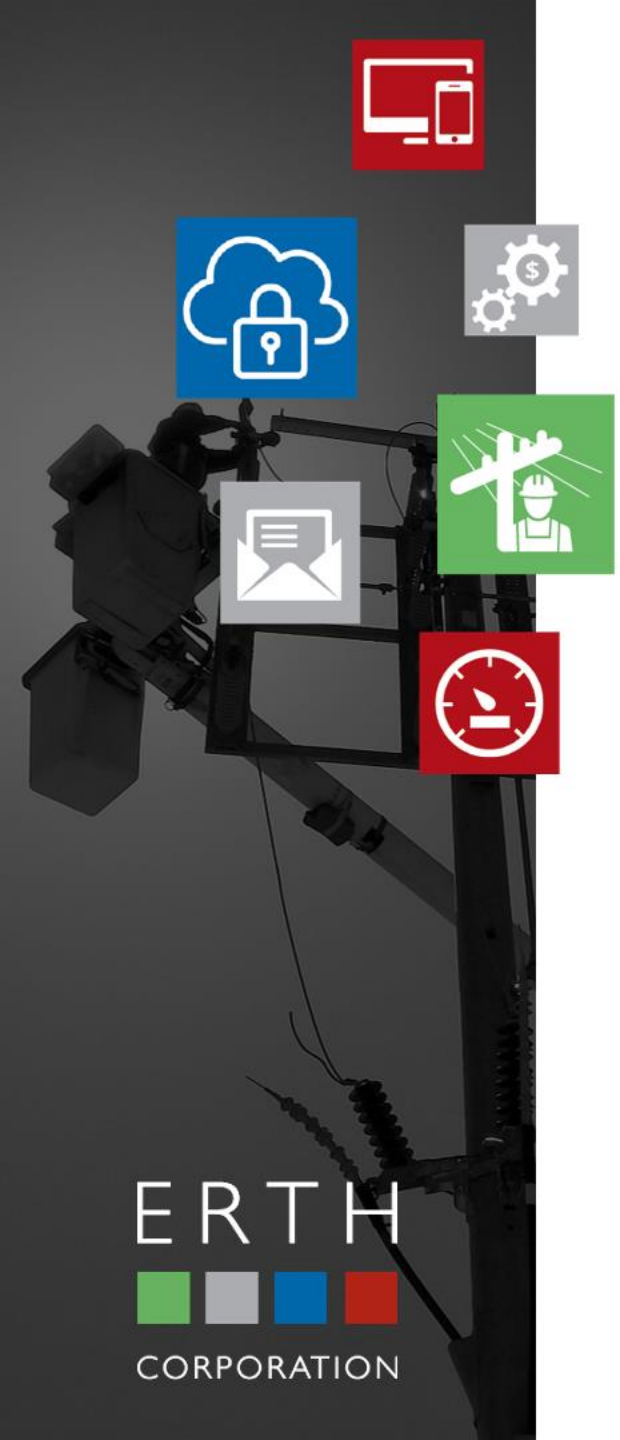
	Page #	Line #
From	120	16
To	122	3

Response:

ERTH Power Corporation does not have any 2023 loss carry-forwards.

Attachment 1

JT1.2 – PowerPoint Presentation with a Review of Properties and Bill Impacts



ERTH Power Corporation

Strategic Planning Session

Regulated Business Unit

September 13th, 2022

Multiple Service Centres

- The largest barrier for ERTH with benchmarking and PEG results is the necessity to maintain three separate operations centres, essentially operating from a field perspective as 3 - 8,000 customer LDC’s.
- The need for three facilities, three small fleets, sets of tools and on call rotations adds a set of challenges and costs that most LDC’s our size are not faced with.
- Moving forward ERTH Power will be required to develop a business case for a potential new building that will include identifying efficiencies and operational improvements.

New Building Construction Implications

- Asset in Rate Base vs. rent/ Right of Use Asset, what are the financial implications, rate implications and other impacts to the business and customer
- Rate Base will increase and along with that increase so will revenue requirement and in turn rates.
- Impacts to debt equity levels will need to be determined as well as impacts to Bank covenants.

Potential Property Purchase

New Facility – Rate Base & Valuation Impacts

- The addition of the new facility adds approximately $15m to rate base an increase of 25% over the 2021 rate base for determination of ROE.
- If the facility is not operational prior to the 2028 cost of service, management would file a future incremental capital module for inclusion in customer rates.
- The 2027 in-service date is crucial from a rate setting perspective to obtain distribution revenues. If the in-service date was 2028 amortization is subject to ½ year rule and as such we would not be recovering enough revenue to support a full year amortization.
- If filing an incremental capital module subsequent to a future merger, for rate base evaluation the amount would be included in the forward rate base calculation; if approved by the OEB
- A valuation metric is often cited is “multiple of rate base approach”. Increasing rate base positively impacts the percentage of ownership in a potential merger.

New Building Assumptions – Summary

2022 OEB Cost of Capital Parameters

New Building Summary				
Land	2,000,000	Long-term Debt	56%	3.49%
Building	13,000,000	Short-term Debt	4%	1.17%
Amortization - years	50	Equity	40%	8.66%
Working capital Allowance	7.25%	WACC	100%	5.47%

	Rate Base	Income Statement
Land & Building	15,000,000	
Rent Savings		($227,000)
WCA	($16,458)	
Amortization expense		260,000
Rate Base / operating revenue	**14,983,543**	**33,000**
Incremental Interest		299,851
Incremental Equity		519,030
		818,881
Total revenue increase		**851,881**

New Building Assumptions

	Initial Application	(2)	Adjustments		Application Update
Rate Base					
Gross Fixed Assets (average)	$76,093,715		$15,000,000		$ 91,093,715
Accumulated Depreciation (average)	($16,167,589)	(5)			($16,167,589)
Allowance for Working Capital:					
Controllable Expenses	$7,970,273		($227,000)		$ 7,743,273
Cost of Power	$64,146,985		$ -		$ 64,146,985
Working Capital Rate (%)	7.25%	(9)	0.00%		7.25%
Utility Income					
Operating Revenues:					
Distribution Revenue at Current Rates					
Distribution Revenue at Proposed Rates					
Other Revenue:					
Specific Service Charges	$600,000		$0		$600,000
Late Payment Charges					
Other Distribution Revenue					
Other Income and Deductions					
Total Revenue Offsets	$600,000	(7)	$0		$600,000
Operating Expenses:					
OM+A Expenses	$7,970,273		($227,000)		$ 7,743,273
Depreciation/Amortization	$2,834,314		$260,000		$ 3,094,314
Property taxes					
Other expenses					

Rate Base Change

Rate Base

Particulars		Initial Application	Adjustments	Application Update
Gross Fixed Assets (average)	(2)	$76,093,715	$15,000,000	$91,093,715
Accumulated Depreciation (average)	(2)	($16,167,589)	$ -	($16,167,589)
Net Fixed Assets (average)	(2)	$59,926,126	$15,000,000	$74,926,126
Allowance for Working Capital	(1)	$5,228,501	($16,458)	$5,212,044
Total Rate Base		$65,154,627	$14,983,543	$80,138,170

Allowance for Working Capital - Derivation

Controllable Expenses		$7,970,273	($227,000)	$7,743,273
Cost of Power		$64,146,985	$ -	$64,146,985
Working Capital Base		$72,117,258	($227,000)	$71,890,258
Working Capital Rate %	(1)	7.25%	0.00%	7.25%
Working Capital Allowance		$5,228,501	($16,458)	$5,212,044

Change in Cost of Capital

Particulars	Capitalization Ratio		Cost Rate
Initial Application			
	(%)	($)	(%)
Debt			
Long-term Debt	56.00%	$36,486,591	3.49%
Short-term Debt	4.00%	$2,606,185	1.17%
Total Debt	60.00%	$39,092,776	3.34%
Equity			
Common Equity	40.00%	$26,061,851	8.66%
Preferred Shares	0.00%	$ -	0.00%
Total Equity	40.00%	$26,061,851	8.66%
Total	100.00%	$65,154,627	5.47%
Application Update			
	(%)	($)	(%)
Debt			
Long-term Debt	56.00%	$44,877,375	3.49%
Short-term Debt	4.00%	$3,205,527	1.17%
Total Debt	60.00%	$48,082,902	3.34%
Equity			
Common Equity	40.00%	$32,055,268	8.66%
Preferred Shares	0.00%	$ -	0.00%
Total Equity	40.00%	$32,055,268	8.66%
Total	100.00%	$80,138,170	5.47%

Change in Revenue Requirement

Particulars	Application	Application Update
OM&A Expenses	$7,970,273	$7,743,273
Amortization/Depreciation	$2,834,314	$3,094,314
Property Taxes	$ -	
Income Taxes (Grossed up)	$ -	$ -
Other Expenses	$ -	
Return		
Deemed Interest Expense	$1,303,874	$1,603,725
Return on Deemed Equity	$2,256,956	$2,775,986
Service Revenue Requirement (before Revenues)	$14,365,418	$15,217,298
Revenue Offsets	$600,000	$600,000
Base Revenue Requirement	$13,765,418	$14,617,298

Allocation of Costs and Customer Impacts

Rate Class	Cost Allocation 2018	Building Rev Req Increase	2021 Customer Count	Annual Rate Change	Monthly Rate Change
Residential	67.98%	$ 579,092.93	21,429	$ 27.02	$ 2.25
General Service < 50 kW	12.33%	$ 105,062.14	2,363	$ 44.46	$ 3.71
General Service > 50 to 999 kW	8.51%	$ 72,490.53	165	$ 439.34	$ 36.61
General Service > 1,000 to 4,999 kW	2.69%	$ 22,914.75	20	$ 1,145.74	$ 95.48
Large Use	2.94%	$ 25,077.44	3	$ 8,359.15	$ 696.60
Unmetered Scattered Load	0.34%	$ 2,870.48	102	$ 28.14	$ 2.35
Sentinel Lighting	0.60%	$ 5,106.00	360	$ 14.18	$ 1.18
Street Lighting	3.16%	$ 26,910.21	7,879	$ 3.42	$ 0.28
Embedded Distributor	1.45%	$ 12,356.09	4	$ 3,089.02	$ 257.42
Total	**100.00%**	**$ 851,880.56**	**32,325**		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Q&A

Attachment 2

JT1.3 – Requirements Document –
385 Thomas St New Build

Project New Build - 385 Thomas Street	**Site Area 340.4'Width + 36'Width by 695' Depth - 6 acres optimum**		
1st Floor Requirements - "CLEAN AREA"	**Requirements**	**Appox. Size**	**Notes**
CLEAN AREA - Administration / Office area	10' ceilings height in office area Water filling stations 1 upstairs - central 2 downstairs - ops area / office area		
Polished concrete and carpet flooring			
Lobby Entrance	Open Space up into second level key fob access to staff area from main entrance 1st floor Main Stairway to 2nd floor - extra wide		fob access beyond unless the stairs are already behind fob area on first floor
	Customer Service kiosk		
	waiting area		
	Feature Wall		
Elevator	beyond Main Entrance		
fold away dividing wall	**Kitchen**	30' x 40'	
	training room	40' x 40'	lighting control w/2 drop down screens, blinds (separate controls in kitchen) training room to have additional closet for work out equipment/coats/table/chair storage central speaking podium in training space
washrooms to accommodate space collaboration area outside of designated spaces coat closet for office staff cleaners closet - cleaning supplies/storage for toiletries hot/cold water with wash tub Paper Storage room / SAFE inside room			
Customer Service Area			
	1 Manager Office & Potential for future office (CDM, keey account)	12' x 13'	
	Customer Service counter facing lobby behind behind glass		
	accommodate up to 5 cubicles	7' x 7'	
	1- meeting space		6 people
Finance/Billing/Regulatory Area			
Approx. to allow meeting smallspace	1 VP office	14' x 14'	
	2 Manager Offices	12' x 13'	
	2 Supervisor Offices	12' x 12'	
	accommodate up to 9 cubicles	7' x 7	
	1 meeting room approx. 12' x 18'		8 people

General

light / bright / open		
operable windows		
Modern Design but functional		
Openish design concept		
access stairs to roof for ease of maintenance		
Dimmable lighting - offices and cubical area		code requirement
Fleet area - in floor heating		
Geothermal system	Heat Pump	to be evaluated
Cistern Rain Water Catchment		not required
Roof designed for solar		
EV Charging in parking lot		EV ready
EV for Fleet		EV ready
bike rack storage for staff		
first aid - supply/rest room		
timed sensor lighting in washrooms/locker rooms/drying room/Server Room etc.		

Appendix B - Mandatory Office Space Standards and Office Space Planning Practices

Office Accommodation Space

The Office Accommodation Space (OAS) standard is up to 180 Rentable Square Feet (RSF) or 160 Useable Square Feet (USF) per workspace and a minimum sharing ratio of 1.3 staff persons per workspace.

Project New Build - 385 Thomas Street	**Site Area**	**340.4'Width + 36'Width by 695' Depth - 6 acres optimum**	
1st Floor Requirements - "DIRTY AREA"	**Requirements**	**Size**	
Fleet Storage Area		180' x 120'	
	Mechanic Bay	30' x 45'	(mechanic bay)
	Operation Prep area	30' x 30'	
	ceiling height	30'	
	drop down from ceiling electrical 120V		
	10' to 15' Covered overhang across the back of building		
	Upper side lite windows		
	4 - hot water wash reels - 1 in each corner of area		
	raised walkway around perimeter 15' for forklift		
	drain in walkways and centre of building		
Stores Warehouse	Approximately	5500 sq/ft	
	ceiling height	20' - 30'	
shipping / receiving	1 loading dock door	facing Thomas street	man door access to outside beside loading dock door
	1 - drive in door	facing east from warehouse	(moved from original drawing)
access to fleet storage	stores counter		
	fork truck access door		
	3 or 4 - 10x10 staging bays		
purchasing / recieving / stores room	2 - 8 x 8 touch downs		
	beside loading dock door (originally where the drive in bay was)		
Warehouse Washroom	1 gender neutral washroom in warehouse with wash sink		
Metering / Stations Area	Approximately	40' x 50'	
	1- office to accomoate 3 touch downs within space		
	ceiling height to match stores		
	accommodate partial 2nd level expansion		
Operations Area			
	access to fleet storage area - grated floor		
	access to clean area - business operations - grated floor		
	back stairs access to upstairs Engineering Area		
	Men's / Women's Washroom / Change room / Locker room / Shower	(20 - 25 men accommodation)	
	washrooms to have both regular sinks and 1 central cleaning sink	(4 women accommodation)	
	Clothes Drying room - heating to dry clothes and de-humidifier	14' x 14'	(sent image)

Operations Area within defined area of Ops space

	1- Operation Manager Office	12' x 13'
	1-Purchasing Manager Office	12' x 13'
	2 - Supervisor Offices	12' x 12'
	6 outside staff touch down desks - time sheet / job prep	5' wide
	1 meeting room -	accommodate 10 people
	space to accommodate general storage for radios and stuff	
	electrical / Mechanical space	
Mezzanine / Storage Area Above	access from fleet storage area	

Mezzanine could host typical roof top equipment

Appendix B - Mandatory Office Space Standards and Office Space Planning Practices

Office Accommodation Space

The Office Accommodation Space (OAS) standard is up to 180 Rentable Square Feet (RSF) or 160 Useable Square Feet (USF) per workspace and a minimum sharing ratio of 1.3 staff persons per workspace.

2nd Floor	**385 Thomas Street**	
Executive Area	**Size**	
CEO office	approx 14' x 16' made to fit space allow for 1 on 1 meetings	
Board room close to CEO office Kitchenette off of boardroom washrooms by kitchenette & boardroom accommodate up to 20 people (rectangle or square room?) automation in board room for blinds and lighting Cupboards / dishwasher / sink / fridge / micro		
COO office	14' x 14'	
CFO	14' x 14'	
VP / General Council	14' x 14'	
EA Corp Secretary	12' x 14'	close to CEO office
1 cubical in executive area	1 - 8' X 8'	
executive area to access outside space over section of outside courtyard (provide shade 1st level)		
Control Room	Approx. 35'x45' ceiling height 16' ish	
small kitchenette fridge / micro / dishwasher / sink 1 gender neutral washroom 2 control room work station desks 1 planning cubical monitor wall space behind wall to access electronics small coat closet / storage notice suppression		
Engineering Room		
1 Manager Office		
1 Supervisor Office		
1 Meeting / collaboration room	accommodate 6 people	
ENG / Design Techs	5 - 10' x10' cubicles	
ENG / Ops clerk	1 - 10' x 8' cubical	isolated corner
back stairs to access 1st floor operations area		
HR / H&S / IT		
2 Manager offices	12' x 13'	
2 supervisor offices	12' x 12'	
accommodate up to 8 - cubicles	7' x 7'	
1 innovation/meeting room	accommodate 8 people	
1 meeting space	accommodate 6 people	

General

file storage room (shelving & table)

washrooms to accommodate space

janitor storage room with hot/cold water and clean up sink
coat closet

Server IT / OT room (raised floor to run cable trays - heating / cooling / fire suppression
Server room to accommodate 2-3 racks plus work area for tech repairs and storage cabinets for IT devises
Raised floor to accommodate CAT cable runs and power supply (Nice to have)

storage area

1/2 access from fleet area - storage mezzanine
Perhaps Control Room would fit better in this area

2nd floor access to elevator
Central collaboration sitting space
operable windows

Attachment 3

JT1.5 – Internal Renderings

LOBBY - INTERIOR PERSPECTIVE - VIEW 2 (Night)

SCALE: NTS

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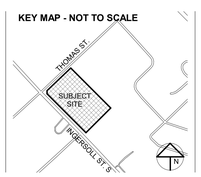
KEY MAP - NOT TO SCALE



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PROJECT STATUS
DESIGN DEVELOPMENT

JOB NO.
2123.00

ISSUE DATE
February 23, 2024

SK14

COLLABORATION SPACE - INTERIOR PERSPECTIVE

SCALE: NTS

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PROJECT STATUS
50% REVIEW

JOB NO.
2123.00

ISSUE DATE
May 10, 2024

SK2

TARKETT - EVEN PLANE
CEMENT LIGHT GREY

TARKETT - EVEN PLANE
CEMENT MEDIUM GREY

TRAINING ROOM - INTERIOR PERSPECTIVE - DAY - OPTION #1

SCALE: NTS

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PROJECT STATUS
50% REVIEW

JOB NO.
2123.00

ISSUE DATE
May 10, 2024

SK3

TARKETT - EVEN PLANE
CEMENT LIGHT GREY

TARKETT - EVEN PLANE
CEMENT MEDIUM GREY

TRAINING ROOM - INTERIOR PERSPECTIVE - NIGHT - OPTION #1

SCALE: NTS

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PROJECT STATUS
50% REVIEW

JOB NO.
2123.00

ISSUE DATE
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SK4

TARKETT - EVEN PLANE
CEMENT LIGHT GREY

TARKETT - EVEN PLANE
CEMENT MEDIUM GREY

LUNCH ROOM - INTERIOR PERSPECTIVE - DAY - OPTION #1

SCALE: NTS

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SK5

TARKETT - EVEN PLANE
CEMENT LIGHT GREY

TARKETT - EVEN PLANE
CEMENT MEDIUM GREY

LUNCH ROOM - INTERIOR PERSPECTIVE - NIGHT - OPTION #1

SCALE: NTS

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ISSUE DATE
May 10, 2024

SK6

TRAINING ROOM - INTERIOR PERSPECTIVE - DAY - OPTION #2

SCALE: NTS

TARKETT - iD LATITUDE STONE/CONCRETE - ALUMIN

TARKETT - iD LATITUDE STONE/CONCRETE - CRISTALLO

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JOB NO.
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ISSUE DATE
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SK7

FINANCE/BILLING/ REGULATORY OPEN OFFICE - DIVIDING WALL SCREEN

SCALE: NTS

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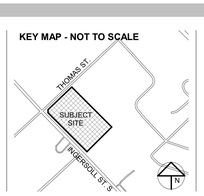

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PROJECT STATUS
DESIGN DEVELOPMENT

JOB NO.
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ISSUE DATE
March 8, 2024

SK22

FINANCE/BILLING/ REGULATORY OPEN OFFICE - OFFICE SCREENS - OPTION 1

SCALE: NTS

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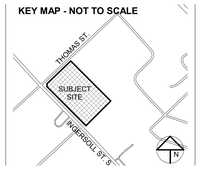

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PROJECT STATUS
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ISSUE DATE
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SK20

BOARDROOM - INTERIOR PERSPECTIVE - VIEW 4 (Night)

SCALE: NTS

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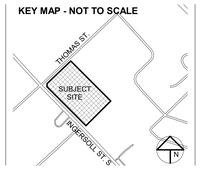

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BOARDROOM - INTERIOR PERSPECTIVE - VIEW 5 (Night)

SCALE: NTS

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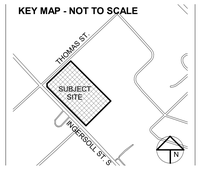

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ERTH POWER CORPORATION

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INGERSOLL, ONTARIO

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PROJECT STATUS
DESIGN DEVELOPMENT

JOB NO.
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February 23, 2024

SK19

Attachment 4

JT1.6 – DER/CDM/NWA Review

POWER ADVISORY

Review of Distributed Energy Resources, Non-Wire Solutions, and Conservation Demand Management

Prepared for ERTH Corporation

January 17, 2025

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Contents

Overview

- Power Advisory has been asked to support ERTH Corporation in developing a business case for Distributed Energy Resource (DER) options, namely behind-the-meter solar, battery energy system, and/or a flexible ground source heat pump at their new operations centre
- Additionally, ERTH is seeking guidance on the development of and opportunities for Conservation and Demand Management (CDM) and Non-Wires Solutions (NWS) for the utility business
- This report is divided into two sections:
    - Chapter 1: Overview of potential opportunities for DERs at ERTH's new operations centre
    - Chapter 2: Industry scan & research: Guidance on CDM and NWS

Task 1: DER Revenue Opportunities

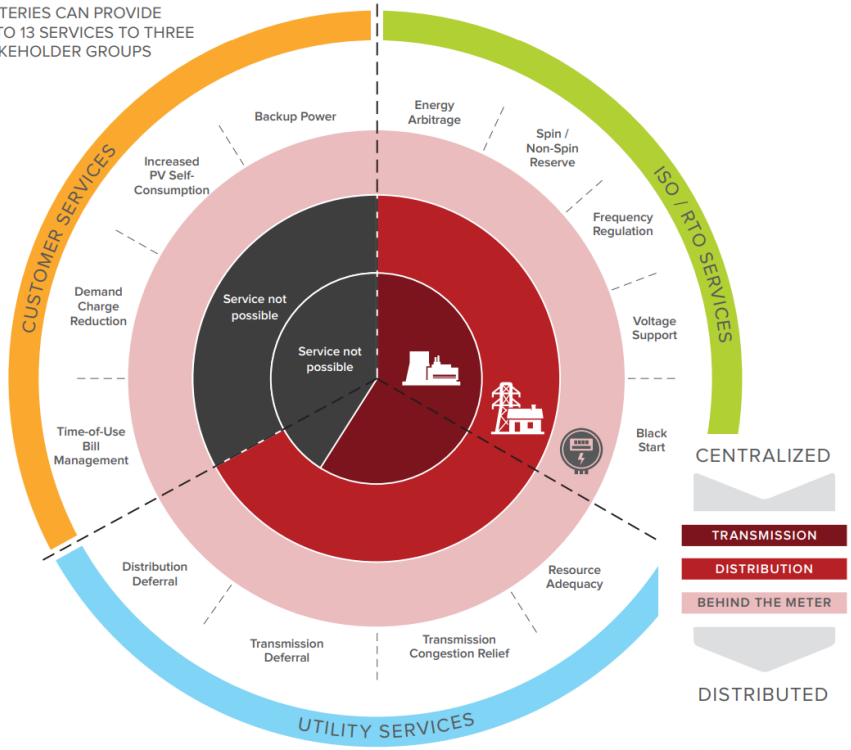
Background

- Power Advisory understands that ERTH is considering the potential for behind-the-meter (BTM) resources to add value to their new operations centre
  - Peak demand is estimated at 460 kW
  - 420 kW of solar is planned
  - There will be a ground source heat pump (GSHP) system which may be suitable for load flexibility
  - A battery storage system may be included if it provides sufficient value
- Power Advisory has assessed options to optimize the business case for DERs at the ERTH operations centre, including:
  - Revenue streams available for solar, storage, and flexible loads
  - Funding opportunities such as government grants

Overview: BTM Resource Value Streams

- Rocky Mountain Institute's report "The Economics Of Battery Energy Storage" highlights the diverse services that battery storage can provide to the electricity system
    - The figure to the right shows which services can be provided for behind the meter, distribution-connected, and transmission-connected storage
- The services which can be monetized in each market depend on regulatory structure and market rules
- The remainder of this section outlines revenue streams available to BTM resources at Class B customers in Ontario

FIGURE ES2
BATTERIES CAN PROVIDE UP TO 13 SERVICES TO THREE STAKEHOLDER GROUPS



THE ECONOMICS OF BATTERY ENERGY STORAGE | 6

Summary of Revenue Streams

Value Stream	Included?	Rationale
Energy Arbitrage	Storage and GSHP	460 kW Class B customer is exposed to wholesale prices
Operating Reserve	*No*	*Not enabled for small distributed resources*
Frequency Regulation, Voltage Support, Black Start	*No*	*No standardized product in Ontario; not enabled for small distributed resources*
Resource Adequacy	Storage	Participation in Capacity Auction as virtual HDR
Wires Deferral and Congestion	*No*	*No standardized product in Ontario*
Time-of-Use Bill Management	*No*	*Not on Regulated Price Plan*
Demand Charge Reduction	Storage and GSHP	Allowed for BTM resources
Increased PV Self-Consumption	*No*	*Not necessary with net metering*
Backup Power	*No*	*No revenue stream; may be valuable to ERTH*
Net Metering	Solar	Allowed for BTM resources

IESO Wholesale Market Services: Eligibility

- Under current market rules, resources must be at least 1 MW to fully participate in the IESO-administered wholesale markets; this threshold may be lowered to 0.1 MW as part of the IESO's forthcoming DER Market Design Project
- For load resources, including loads with behind-the-meter resources, there are three different participation types with access to different markets and participation models. See the table below:

Participation Model	Energy Arbitrage	Day-Ahead Energy Market	Real-Time Energy Market	Operating Reserve	Capacity Auction
Non-Dispatchable Load	Yes	No	No	No	As HDR
Price-Responsive Load	Yes	Yes	No	No	As HDR
Dispatchable Load	Yes	Yes	Yes	Yes	As Dispatchable Load

- Under current market rules, ERTH's operations centre will be considered a non-dispatchable load which can access energy arbitrage and capacity action revenue streams (as hourly demand response or HDR)
- If IESO moves forward with its DER Market Design Project in the future, ERTH could consider more active participation in the day-ahead market and/or operating reserve to access additional revenue streams for BTM storage
    - However, there are considerable costs and administrative requirements to wholesale market participation
    - Power Advisory does not recommend considering revenue streams from wholesale market participation in the business case at this time
    - More details on wholesale market participation and outlook are provided in Appendix 1 and Appendix 2
- Note that that the PRL model will go-live with Market Renewal (May 2025)

Wholesale Market Services: Energy Arbitrage

- The ERTH operations centre will pay an hourly commodity charge based on wholesale market prices and a volumetric Global Adjustment Charge
- BTM storage can provide value by charging when hourly prices are low and discharging when hourly prices are high
  - A flexible GSHP may be suited to provide a similar service, increasing consumption during times of day with lower prices. In effect, a flexible GSHP uses thermal storage rather than electricity storage
  - Energy arbitrage revenue is highly dependent on the hourly volatility of energy market prices
- It is not necessary to register as a wholesale market participant to access energy arbitrage on the hourly commodity charge

Wholesale Market Services: Capacity Auction

- Capacity suppliers who secure a capacity auction obligation in one or both of two, six-month obligation periods (summer and winter) can receive a payment, based on the auction clearing price, for making their capacity available during a window of hours on each business day
    - Historical (2018-2024) capacity auction clearing prices are shown to the right
- Assuming the BTM storage resource, plus any additional load flexibility, is less than 1 MW, ERTH can participate in the capacity auction as a virtual HDR resource through an aggregator
    - Aggregators combine small individual capacity contributors into larger accounts which participate in the auction. Each capacity contributor will get a share of the capacity availability payment and pay a fee to the aggregator
- IESO's Market Manual Chapter 12.0: Capacity Auctions describes the rules for participation and important timelines

Year	Season	Capacity Auction Clearing Price ($/MW-business day)	Capacity Auction Clearing Price ($/MW- year)
2018	Summer	$318.01	$77,960
2018	Winter	$317.46	
2019	Summer	$234.64	$64,031
2019	Winter	$200.00	
2020	Summer	$268.16	$59,283
2020	Winter	$221.83	
2021	Summer	$197.58	$42,888
2021	Winter	n/a	
2022	Summer	$264.99	$35,869
2022	Winter	$60.00	
2023	Summer	$313.79	$50,531
2023	Winter	$130.78	
2024	Summer	$332.39	$58,839
2024	Winter	$139.00	

Customer Services: Demand Charge Management

- DERs can be used to reduce demand charges, which are calculated based on peak monthly demand
  - In ERTH's main rate zone, total demand charges for a 460 kW load in 2024 are $12.83/kW-month[1]
- Noncoincident demand charge savings from standalone BTM solar are typically low due to poor coincidence between output profiles and load profiles
  - As a dispatchable resource, battery storage is more well-suited to reduce demand charges
  - Adding storage to BTM solar typically leads to greater potential demand charge savings than storage alone[2]
- During the heating season, heat pump consumption is likely to drive peak demand
  - There may be low-cost solutions, such as a modified control strategy and/or thermal storage, which could be used to mitigate demand charges for the heat pump

1. ERTH Power Corporation, 2024 Distribution Rates https://www.rds.oeb.ca/CMWebDrawer/Record/850777/File/document
2. NREL, Solar + Storage Synergies for Managing Commercial-Customer Demand Charges https://www.nrel.gov/docs/fy18osti/70360.pdf

Customer Services: BTM Load Reduction and Net Metering

- Electricity generated by ERTH's planned solar capacity will reduce commodity charges (comprising the cost of wholesale energy and volumetric Global Adjustment) and wholesale market service charges
- Under net metering regulations established by the Ministry of Energy and Electrification, electricity customers that generate renewable electricity to send excess power to the grid create a credit that offsets their future electricity consumption
    - In other words, generation from the solar system will produce revenue at commodity rates whether it offsets the operation centre's consumption or injects energy into the distribution system

Risks for Revenue Streams

- Energy Arbitrage
  - Value from energy arbitrage may vary depending on market conditions and operating strategy
  - Cycling losses and auxiliary load for batteries will reduce net energy arbitrage value
- Capacity Auction
  - There are relatively small penalties for resource outages and failing to respond to activations
  - There are large penalties for failing test activations; a penalty equal to a full month of availability payments plus revision of qualified auction capacity to align with test results
  - Future prices are uncertain and volatile
- Demand Charge Management
  - Operational complexity: requires accurately dispatching storage and/or load flexibility to target each month's peak consumption
- Solar generation and net metering
  - Future wholesale energy prices are expected to be stable in real terms, but growth of solar generation across the system could reduce market prices in the hours where solar output is highest
  - Unanticipated policy or regulatory changes could undermine the business case for BTM solar generation (e.g. taxpayer support for electricity commodity, changes in net metering rules, etc.)

Other Funding Sources Available

- DERs installed at ERTH's operations centre may be eligible for the following federal government funding sources:
  - 15% Clean Electricity Investment Tax Credit (if ERTH Corporation is tax-exempt)
  - Smart Renewables & Electrification Pathways Program (SREP) Utility Support Stream
  - Green Municipal Fund (GMF)
- For more details, see the "Funding for DER and NWS Initiatives" section below

Task 2: CDM and NWS Industry Scan

Outlook for CDM and Electrification in Ontario

2025-2036 Energy Efficiency Framework Updates

- On October 4, 2024, the Ministry of Energy posted its 2025-2036 Electricity Energy Framework proposal on the province's Environmental Registry of Ontario (ERO); the comment period closed on November 3
- Changes proposed in the new framework include:
  - Given Ontario's higher demand forecast and energy needs, the 2025-2036 framework will likely include higher targets than the current framework.
  - Expanding the current program portfolio to ensure programs target all consumers.
  - Creating a single program delivery window for residential customers to access both natural gas and electricity efficiency programs.
  - Increasing LDC involvement by providing a dedicated budget for energy efficiency activities involving LDCs.
  - The introduction of long-term programs and funding stability within a 10-year period to cover a broader set of sector and customer segments
- The new electricity demand side management (DSM) framework and delivery model would start on January 1, 2025.
- Power Advisory's full commentary on the ERO posting is available here.

Proposal for to Promote Beneficial Electrification

- On October 23, 2024, the Ministry of Energy posted a proposal to the Environmental Registry for amendments to the Electricity Act, 1998 that would enable the IESO to administer enhanced energy efficiency programs that support beneficial electrification (BE)
- November 8, 2024, another proposal was posted for Beneficial Electrification (BE) programming that would be delivered by the IESO starting in 2025 under the 2025-2036 electricity energy efficiency framework
    - BE would be coordinated with EE programs offered by the IESO and would be targeted towards offering electricity measures for non-electric end-uses
- BE programming would:
    - BE funded would be through electricity rates
    - Provide incentives to adopt clean electricity measures for use in daily life
    - Provide consumers with more options to reduce their overall energy use without compromising comfort while reducing their energy bills and carbon footprint
    - The focus of the program will initially focus on fuel oils heated homes to electric heat pumps

Ontario Launches New Energy Efficiency Programs – NEW!

- **January 7, 2025:** The Ontario government is launching new energy efficiency programs, including the new Home Renovation Savings Program. The programs are part of a new $10.9 billion, 12-year investment in energy efficiency, the largest in Canadian history.
- **Cost Savings:** $23.1 billion in electricity system benefits, thereby saving ratepayers $12.2 billion in electricity system costs by avoiding the build out of new generation.
- **New Home Renovation Savings Program** will launch on January 28, 2025, and offer rebates of up to 30 per cent for home energy efficiency renovations and improvements, including new windows, doors, insulation, air sealing, smart thermostats, and heat pumps, as well as rooftop solar panels and battery storage systems for people who want to generate and store energy at home. Later in 2025, the program will expand to include rebates for energy efficient appliances, including refrigerators and freezers.
- Affordable Energy Act ensures program offerings, will be expanded to homeowners who heat their homes by propane and oil, instead of being restricted to those who heat with electricity, as it was under previous governments.
- **Expanding Peak Perks Program** with a new program specifically targeted to small businesses, including convenience stores and restaurants. Businesses will receive a financial incentive of $75 upon initial enrollment in the program and $20 per year for each eligible smart thermostat connected to a central AC system or heat pump unit.
- Continue to support 12 Save on Energy programs, as well as other programs geared to low-income households, businesses, municipalities, institutions, the agricultural sector, industry and on-reserve First Nations communities.

IESO to launch eDSM framework + BE measures – NEW!

- **November 7, 2025**: Directive from the Minister for IESO to launch new 12-year electricity conservation and demand-side management procurement program (eDSM) :
  - Goal is to help meet the needs of Ontario's electricity system cost-effectively, including by focusing on capacity and electricity savings and supporting reliability.
  - The IESO shall make programs under the eDSM Framework available from **January 1 ,2025 to December 31, 2036**
  - The eDSM plan for 2025-2027 shall be posted publicly by **February 1, 2025** and each subsequent plan shall be posted publicly before **January 1 of the first year** of the three-year period covered by the plan.

- **December 19, 2025 (amended November Directive):** Directive from the Minister for IESO to launch Beneficial Electrification(BE) measures within DSM Framwork:
  - Goal is to promote electrification or the use of electricity to reduce emissions in Ontario, while minimizing the electricity system impacts.
  - Design, deliver, and fund measures for eligible consumers while avoiding duplication with OEB-approved natural gas demand-side programs
  - Measures are not bound by cost-benefit benchmarks but must be delivered cost-effectively to reduce emissions
  - IESO will coordinate with the OEB as needed to assess natural gas use in cost-effectiveness evaluations.
  - Up to 20% of the eDSM plan budget will be used for BE measures

Other Funding for CDM and Electrification

Summary of Funding Sources

Funding Level	Program Title	Eligibility	Funding Available
Federal	Greener Homes Grant	Homeowners	Up to $5,000
Federal	Greener Homes Loan	Homeowners	Up to $40,000 interest-free financing
Federal	Oil to Heat Pump Affordability program	Homeowners	Up to $10,000
Federal	Green Municipal Fund	Significant municipal involvement	Varied; up to 50% of total costs

- Natural Resources Canada (NRCan) maintains a national directory of energy efficiency programs which may be useful when considering future CDM activities
- Some programs in this section are suitable for both CDM and renewable energy/DER initiatives

Federal Funding: Canada Greener Homes Grant

- Through the **Canada Greener Homes Grant** , the Government of Canada has provided Canadian homeowners with grants of up to $5,000 since December 1, 2020 to improve the energy efficiency of their homes and reduce their energy bills
    - It has been a big success throughout Canada and as a result, funding has been fully committed and the program is closed to new applicants at this time
- The closure of intake of new applications to the Canada Greener Homes Grant does not affect other Canada Greener Homes Initiatives including:
    - the Oil to Heat Pump Affordability program
    - the Canada Greener Homes Loan
- The **Canada Greener Homes Loan** available to help Canadians make their homes more energy efficient
    - It offers up to $40,000 in interest-free financing to homeowners at the pre-retrofit stage, repayable over 10 years
- The **Oil to Heat Pump Affordability program** helps Canadian homeowners, who are currently heating their homes with oil, transition to electric heat pump system
    - Making the switch can help homeowners save thousands of dollars on heating bills every year and help reduce greenhouse gas emissions
    - Up to $10,000 available to eligible homeowners across Canada for the purchase and installation of eligible heat pump systems, and certain associated eligible measures related to the installation

Federal Funding: GMF

Green Municipal Fund (GMF)

- Funded through the Government of Canada, under the Infrastructure Canada program.
- Provides grants and low-interest loans to municipalities, local governments, non-profit organizations and projects that are municipally led or have significant municipal involvement.
- If an LDC collaborates with a municipality or is municipally owned, it could potentially access GMF funding for projects aligned with the program's objectives*
- The GMF covers a range of costs associated with project development, including feasibility studies, capital costs, and project implementation.
- Supports a variety of project types, including energy efficiency improvements, renewable energy projects, green infrastructure and low-impact development projects.
- The specific funding amounts can vary based on project type and scope. However, the GMF typically supports projects with funding up to 50% of eligible costs .

* Power Advisory believes that ERTH Corporation would likely be considered for GMF funding as a municipally-owned corporation

Potential Municipal Funding

Association of Municipalities Ontario (AMO)

- Nonprofit organization that advocates for municipal interests at the provincial and federal levels, focusing on policies, funding, and legislation that impact local governments and their communities
- They do not provide specific funding but help keep municipal governments informed with IESO/OEB topics to increase exposure and funding potential for the future
- ERTH could monitor the AMO for potential municipal funding opportunities

Outlook for NWS and DERs in Ontario

OEB Benefit-Cost Analysis Framework (BCA)

- The Ontario Energy Board (OEB) Benefit-Cost Analysis Framework for Addressing Electricity System Needs, updated in May 2024, outlines mandatory requirements for conducting a Benefit-Cost Analysis (BCA) to determine whether NWS, traditional infrastructure, or a combination is the most cost-effective option
- The document includes detailed instructions on what to include in the BCA, how to approach the analysis, and how to interpret the results. It also outlines the filing requirements for submitting the BCA to the OEB
- The framework aims to encourage the adoption of cost-effective solutions that benefit customers while ensuring transparency and consistency in decision-making
- It is designed to help electricity distributors with system planning and rate-setting applications when seeking ratepayer funding for capital investments. This includes approval for rate funding as part of Incremental Capital Module (ICM) applications
- The framework is referenced in the OEB's existing Filing Requirements, including the Chapter 5 filing requirements which cover filing requirements for electricity distribution rate applications
- Distributors should use the BCA Framework for all new project planning activities going forward, including new projects and projects in early stages

OEB BCA Guidelines

- As part of the BCA framework, distributors must document consideration of NWSs when filing applications for electricity system investments with expected capital costs greater than $2 million, excluding general plant investments
- Degree of NWS consideration varies; some system needs may clearly be unsuitable for NWSs
- Pre-assessment:
  - Conducted to determine if NWSs could be *viable* for the identified need
  - May leverage *binary screening criteria* and technical evaluations from Enbridge Gas's IRP Framework and IESO's Guide to Assessing Non-Wires Alternatives
  - No mandatory format or requirements established by the OEB for pre-assessment
- BCA:
  - If pre-assessment finds that an NWS is viable (i.e., pass/fail), distributors should complete a BCA and document results per the BCA Framework to assess economic feasibility. The BCA should be filed along with the pre-assessment results
  - The OEB sets out considerations and tests to be performed as part of the BCA

Electrical Safety Authority

- Additional guidelines from the ESA with respect to DERs are published in the Guidelines for DERs document
- The Guidelines are intended to assist members of the industry in understanding roles and responsibilities under Ontario Regulation 22/04 Electrical Distribution Safety
- Along with O. Reg. 22/04 and other appropriate Codes and Standards, the ESA Guidelines form the basis on which ESA will assess the safety of the electrical distribution installations within the Province of Ontario
- Per the ESA Guidelines, a DER is deemed part of a distribution system under O. Reg. 22/04 if it meets the following criteria:
    1. The DER system is deemed a distribution asset by the OEB or if the distribution asset status has not been established
    2. The DER system is connected to the distributor's side of an ownership demarcation point
    3. O. Reg. 22/04 Sections 4 & 5 are satisfied.
- DERs may be considered a distribution asset covered by O. Reg. 22/04 if used for congestion relief, upgrade deferrals, area regulation, voltage support, substation on-site power, electric service reliability, electric service power quality, and/or emergency power
- Applications that the DER can provide which are not covered under the regulation are electric energy time-shift, TOU energy cost & demand management, electric supply capacity, load following, and electric supply reserve capacity
- The detailed technical considerations and application synergies can be referenced in Appendix B of the Guidelines report

Funding for DER and NWS Initiatives

IESO directed to proceed with several electricity supply initiatives- New!

- **November 28th, 2025:** Directive From the from the Minister of Energy and Electrification
- **March 2025:** Deadline for the IESO to launch the second long-term procurement for electricity supply
- The IESO aims to issue the final contracts resulting from the LT2 RFP process by **March 31, 2029**
- **Minister provides parameters for the procurement including:**
  - Targets: **14 TWh for energy stream and 1,600 MW capacity stream** for LT-2
  - Contract length: Expected commercial operation date no later than **May 1, 2034, and 20-year contract terms**
  - Siting restrictions: All eligible projects are restricted from being built in specialty crop areas, new ground-mounted solar projects are prohibited from being built in Prime Agricultural Areas and all other eligible projects may only locate on lands which constitute Prime Agricultural Areas as defined in the Provincial Planning Statement.
- The IESO must report back by **March 14, 2025**, on the design of a separate procurement for long-lead resources, prior to the launch of LT-2.
- **Local Generation Program:** IESO instructed to report back **by April 30, 2025** on a proposal to establish a local small generation procurement program in Ontario. It is expected that the program would launch **early 2026**.

Summary of Funding Sources

Funding Level	Program Title	Funding Available
Federal	Investment Tax Credits (ITCs)	15% or 30% credit depending on ownership and tax-exempt status
Federal	NRCan Smart Renewables & Electrification Pathways Program (SREP) Utility Support Stream	$50 million or up to 50% of total project costs, whichever is less.
Provincial	Independent Electricity System Operator (IESO) Grid Innovation Fund	2024 budget of $9.5 million
Provincial	Ontario Energy Board's (OEB) Innovation Sandbox	$1.5 million in 2023 project call

Clean Technology Investment Tax Credit (ITC)

- The federal government's Clean Technology ITC is a 30% refundable tax credit for the capital cost for certain investments made by taxable Canadian corporations
  - Refundable tax credit is a bit of a misnomer and should be viewed as a type of government grant; a refundable ITC can be obtained regardless of whether the entity has a tax liability to offset, or not
  - Available as of March 28, 2023 and no longer in effect at the start of 2035, subject to a phase-out starting in 2032
- The Clean Technology ITC covers investments in:
  - Electricity Generation Systems, including solar photovoltaic, small modular nuclear reactors, concentrated solar, wind, and water (small hydro, run-of-river, wave, and tidal)
  - Stationary Electricity Storage Systems that do not use fossil fuels in their operation, including but not limited to: batteries, flywheels, supercapacitors, magnetic energy storage, compressed air storage, pumped hydro storage, gravity energy storage, and thermal energy storage
  - Low-Carbon Heat Equipment, including active solar heating, air-source heat pumps, and ground-source heat pumps
  - Industrial zero-emission vehicles and related charging or refueling equipment, such as hydrogen or electric heavy-duty equipment used in mining or construction
  - NRCan's Technical Reference guide outlines what qualifies as Class 43.1 or 43.2 Clean Technology property which is eligible for the tax credit
- Certain labour conditions need to be met to obtain the full 30% ITC, otherwise the ITC is 20%

Clean Electricity ITC

- The Clean Electricity ITC is a very similar refundable tax credit to the Clean Technology ITC, but expands eligibility:
  - The Clean Electricity ITC is available to both taxable and non-taxable entities such as Crown corporations and publicly owned utilities, corporations owned by Indigenous communities or municipalities, and pension funds
- The Clean Electricity ITC covers investments in new and refurbished projects in:
  - Non-emitting electricity generation systems: wind, concentrated solar, solar photovoltaic, hydro (including large-scale), wave, tidal, nuclear (including large-scale and small modular reactors)
  - Abated natural gas-fired electricity generation (which would be subject to an emissions intensity threshold compatible with a net-zero grid by 2035)
  - Stationary electricity storage systems that do not use fossil fuels in operation, such as batteries, pumped hydroelectric storage, and compressed air storage; and
  - Equipment for the transmission of electricity between provinces and territories
- Labour requirements that come into effect on October 1, 2023, such as paying wages at the prevailing rate and creating apprenticeship training opportunities, need to be met to receive the full 15% ITC; failing this, the ITC will be reduced to 10%
- To obtain the ITC there needs to be a commitment that it will be used to lower electricity bills, and a commitment to achieve a net-zero electricity sector by 2035

Federal Funding: SREP Utility Support Stream (1)

- The Smart Renewables & Electrification Pathways Program (SREP) is a Canadian government initiative that supports clean electricity infrastructure projects.
- SREP funds projects that focus on renewable energy, energy storage, grid modernization, and non-emitting technologies, including NWSs.
- Initially launched with a budget of $1.56 billion.
- SREP received an additional $2.9 billion in Budget 2023, bringing the total to approximately $4.5 billion.
- In October of 2024, Jonathan Wilkinson, Minister of Energy and Natural Resources, announced up to $500 million in funding for the SREP Utility Support Stream; eligibility criteria and funding is outlined in the next 2 slides.
- Although the deadline for the USS is fast approaching (December 13th), there may be similar opportunities in the future to obtain funding from NRCan.
- It will be important to review this criteria and plan future projects while monitoring NRCan's calls for proposals

Federal Funding: SREP Utility Support Stream (2)

- NRCan's Smart Renewables and Electrification Pathways program (SREP) has just released its latest round of funding opportunities through the new Utility Support Stream (USS)
- A request for Expressions of Interest (EOI) has been launched on Thursday, October 10, 2024 and the Program will be accepting applications until Friday, December 13, 2024, at 11:59 PM PST. The EOI is in anticipation of a request for project proposals to be launched in the first half of 2025
- The USS aims to support utilities in modernizing their systems and processes to enable renewable energy integration while maintaining reliability and affordability
- Eligibility criteria: Projects must be led by a utility, system operator, or an entity that demonstrates that the project will directly benefit a utility and/or system operator to meet their needs. Projects must:
    - enable decarbonization of the electricity system;
    - represent a permanent installation of equipment or a modification to existing processes, equipment, or systems for commercial operations;
    - be located in Canada and provide services or capabilities for sale or use in Canada; and
    - represent a proven technology – Technology Readiness Level (TRL) 8 or above
    - Energy storage projects are eligible only if they are owned and/or operated by a utility or system operator, or they are providing services to a utility or system operator on a contractual basis

Federal Funding: SREP Utility Support Stream (3)

- Projects interested in applying under the USS must fall within one or more of the targeted areas:
  - Existing asset upgrade or enhancement, Clean energy integration or System expansion and sustainment, this category would also include non-conventional infrastructure solutions such as NWAs
  - Examples of projects that may receive funding include smart grid technologies
- Project Funding:
  - The maximum amount of SREPs funding for an individual project is $50 million or up to 50% of total project costs, whichever is less
- EOI Evaluation process:
  - The funding amount for each project will be determined by evaluating information such as project documentation, financial plan (including sources and amount of funding from other funders), a risk-based due diligence assessment, and other documents submitted during the application process

Provincial Funding: GIF and Innovation Sandbox

IESO Grid Innovation Fund (GIF)

- IESO's GIF supports projects that help Ontario ratepayers save on electricity bills by funding initiatives that enable better energy management or reduce grid maintenance costs
- Focuses on specific projects to validate new technologies and overcome market barriers for cost-effective energy solutions
- Since 2005, it has funded over 200 projects . It issues targeted and open calls for projects, funds up to a percentage of project costs, and supports projects no longer than three years
- GIF released a 2024 call for proposals with a maximum budget of $9.5 million; the proposal submission window is now closed

OEB's Innovation Sandbox

- The OEB's Innovation Sandbox is designed to facilitate innovative energy projects
- The sandbox allows project proponents to request temporary regulatory relief to pilot NWSs and demonstrate their value without the full burden of existing regulations
- It helps unlock third-party funding opportunities by removing regulatory hurdles that may otherwise prevent projects from moving forward
- The OEB Innovative Sandbox also provide support throughout a project lifecycle by helping proponents understand how NWS projects might be funded under current or adjusted regulatory models
- In 2023, The OEB selected six projects to receive one-time total funding of $1.5 million to support innovation in the energy sector as part of its Innovation Sandbox Challenge

DSO and DER Ownership Considerations

DSO Operations (1)

- A Distribution System Operator (DSO) is an entity responsible for the operation and management of the distribution network, ensuring reliable and efficient delivery of electricity while facilitating the integration of DERs
- DSOs could operate local markets for DER services, allowing for more flexible and responsive energy solutions tailored to specific local needs. Additionally, DSOs may be required to coordinate with the IESO's wholesale market, facilitating DER participation in both local and wholesale markets
- Ontario does not have a framework for DSOs, though it may emerge in the future. The LDC needs to operate within current regulatory rules while staying informed about potential developments
- If DSOs are established in the future, their structure could inform ownership options, for example:
    - If DSOs are independent from LDCs, LDCs could own DERs without conflicts, provided they adhere to the same market rules as other providers
    - If DSOs and LDCs are the same entity, conflicts of interest could deter investment, reduce competition, and hinder efficient NWS implementation
- A critical issue is avoiding both real and perceived conflicts of interest. To ensure a level playing field for all DERs in the market, several mechanisms can be implemented. Key questions include:
    - How can oversight prevent LDC-owned DERs from having a competitive advantage over non-LDC-owned DERs?
    - What governance is necessary to ensure that non-LDC-owned DERs have fair access to opportunities?

DSO Operations (2)

- Future regulations and market rules development could ensure sufficient market oversight and require internal structural separation of DSO and LDC functions to reduces concerns about conflicts of interest
- Regulatory or market oversight of local markets: could maintain integrity to promote transparency, similar to the IESO's Market Surveillance Panel
- Ontario's model is unique in that it allows rate-regulated and contracted assets to compete in the IESO market. IESO serves as the contractual counterparty for resources enabled to participate in the wholesale market
- It is possible that future DSO models could adopt a hybrid approach, allowing LDCs to own DERs while also operating a local market as a DSO
- Given the many unknowns, ERTH should evaluate ownership options based on the current rules and regulations while monitoring how DSOs may evolve in the future
- If an LDC advances an LDC-owned DER as an NWS and future DSO rules are established that do not permit ownership of participating DERs, there are solutions that could be considered at that time to ensure compliance and proceed with the DSO business model
    - For example, the LDC could decide to sell the asset in the future, transitioning to non-LDC ownership of the DER solution

DER Ownership for LDCs: Summary

- LDCs may either own DERs directly or contract services from a competitive entity (i.e., a "third-party provider")
- An LDC-affiliate company would be considered a third-party provider

Consideration	LDC-owned	Not LDC-owned (i.e., Third Party Owned)
Meter Demarcation Point	BTM & FTM	BTM & FTM
Eligible technologies	Storage, generation	Storage, generation, load control
Business model	LDC owned & operated LDC owned & third-party operated (i.e., service agreement for market operations)	Service agreement with third-party provider
Procurement model	RFP(s) for engineering design, equipment sourcing, construction, operations & maintenance	RFP for services or program design
Utility remuneration	Capital investments, with some additional operating expenses	Distributor-proposed incentive mechanism
Revenue offsets	LDC risk vs. third-party risk	Competitive risks
Dispatch coordination for LDC services	Internal coordination	Consistent with contract or program rules

DER Ownership Considerations (1)

- **Meter Demarcation Point:** DERs that are part of an NWS can be located either front-of-the-meter (FTM) or BTM. Both LDCs and third-party entities are allowed to own and operate DERs behind a customer's meter
- **Eligible Technologies:** LDCs can own and operate storage and generation as part of an NWS. Third-party providers can also offer demand response via load control agreements with customers
- **Business Model:** LDCs can own and operate storage and generation DERs directly as part of an NWS. Alternatively, the LDC can own the asset and contract with a third party to operate it via a service agreement. This agreement could allow the third party to offer additional services (e.g., wholesale market, customer services) when the resource isn't needed for distribution services. If the third party owns and operates the DER, the LDC would need a service agreement for the provision of distribution services, either through a contract or a local market for these services
- **Procurement Model:** LDCs would follow standard utility practices for competitive tendering of DER services when the DERs are owned by the LDC. This would involve issuing requests for proposals (RFPs) for engineering, design, equipment sourcing, construction, and operations and maintenance of the DER solution. For third-party-owned DERs, LDCs would issue an RFP for distribution services, with the service contract outlining specific requirements for the DER provider

DER Ownership Considerations (2)

- **Utility Remuneration:** For LDC-owned DER assets, utility remuneration follows the traditional model, where returns are based on capital expenditures. Any revenues earned from LDC-owned DERs would reduce the revenue requirement (i.e., serve as a revenue offset). In cases where LDCs procure services instead of owning the DER, they are permitted to propose an incentive mechanism as outlined in the NWS guidelines

- **Revenue Offsets:** The cost of an NWS can be offset by revenues the DER generates from other markets, such as the IESO wholesale market. For LDC-owned DERs, these expected revenues can reduce the revenue requirement. However, if the DER does not achieve the anticipated revenues, the LDC faces the risk of higher-than-expected net costs for the distribution solution. If the LDC owns the DER but contracts out its operation to a third party, this risk can be hedged through performance contracts. Alternatively, if the LDC procures an NWS from a third-party provider, the provider would typically assume the competitive market risks related to additional revenues. In this case, the LDC's agreement would specify performance requirements to ensure distribution services are prioritized

- **Dispatch Coordination:** If the LDC owns the DER as part of the NWS, all coordination for its operation would be handled internally. For third-party-owned DERs, the LDC would need to provide operating instructions to the DER operator, including requirements to follow dispatch instructions. Contracts should specify communication protocols, measurement, verification, and other requirements, such as notifications for when the DER is unavailable or unable to respond to dispatch

LDC Ownership of DERs: Overview

- LDCs that own and operate DERs as part of an NWS must comply with the OEB Act, including obtaining the appropriate licenses (outlined in the next slide)
- Under the OEB's NWS guidelines, LDCs are allowed to propose LDC-owned solutions but it is expected that LDCs will evaluate the availability of alternative solutions from competitive third parties.
- LDCs can utilize standard remuneration approaches concerning capital expenditures, however, the integration of NWSs will likely require additional operational expenditures not typically associated with traditional "poles and wires" solutions.
    - For example, LDCs investing in energy storage may need to develop internal processes for operating the energy storage facility or may require contracting services for facility operations. It is not clear from the existing OEB guidance how they would consider these additional operational expenses as part of LDC applications
- Financial considerations:
    - LDCs will be responsible for procuring the NWS and incurring the associated development costs
    - They will need to consider the asset's lifespan and the long-term revenue streams that could arise from providing services to other markets, such as wholesale market participation
    - Projecting the long-term revenue associated with these services introduces risks and uncertainties that LDCs must manage

LDC Licensing Requirements

- According to Section 57 of the Ontario Energy Board Act (OEB Act), no individual or entity may engage in specific activities related to electricity unless licensed
- These activities include:
  - owning or operating a distribution or transmission system
  - generating electricity or providing ancillary services for sale through IESO-administered markets
  - engaging in unit sub-metering
  - retailing electricity
  - purchasing electricity or ancillary services directly from a generator or in IESO-administered markets
  - selling electricity or ancillary services (excluding sales to consumers)
  - directing the operation of transmission systems in Ontario, operating the market
- Section 57(a) of the OEB Act (1998) provides that no person is permitted to own or operate a distribution system without a licence
- Licensees must comply with the OEB's Distribution System Code, Affiliate Relationships Code for Electricity Distributors and Transmitters, Retail Settlement Code, Standard Supply Service Code, and all other conditions set out in their licence
- Section 71 of the OEB Act summarizes restrictions on transmitter and distributor business activities
- Transmitter and distributor businesses may engage directly in activities that support Ontario's electricity conservation goals, such as promoting energy efficiency, load management, and cleaner energy sources
- Distributors are permitted to own and operate renewable energy generation facilities (up to 10 MW), combined heat and power facilities, and energy storage facilities, provided these meet regulatory criteria

Benefits of LDC Ownership

- Benefits of LDC Ownership of DERs include:
  - Ability to Include in Rate Base as Capital Asset: By owning NWSs, LDCs can incorporate these assets into their rate base, enabling them to recover costs over time through regulated rates. This can enhance financial stability and provide a predictable revenue stream, allowing for better long-term planning and investment in additional infrastructure or upgrades
  - Limited Extra Administration for Contractual Agreements with Third Parties: Owning NWSs simplifies the administrative burden associated with managing external contracts. This ownership eliminates the need for extensive negotiations and ongoing management of third-party agreements, reducing complexity and streamlining operations
  - Ability to Internalize Performance Risks of NWSs: When LDCs own NWSs, they can more effectively manage performance risks associated with these solutions. Internalizing these risks means that LDCs can implement performance metrics and monitoring systems that align with their operational goals
  - Facilitation of Innovation and Development of New Solutions: By owning and operating NWSs, LDCs can foster innovation within their organizations. They can experiment with new technologies and solutions that could enhance their service offerings, providing a competitive edge in the evolving energy market
  - Data and Insights for Improved Operations: Owning NWSs provides LDCs with direct access to data generated from these systems. This information can lead to improved decision-making, operational efficiencies, and enhanced forecasting capabilities, enabling LDCs to optimize their grid management strategies

Challenges of LDC Ownership (1)

- Challenges with LDC Ownership of NWSs:
  - Limited Technology: LDCs may face restrictions in leveraging certain technologies when they own NWSs. For instance, they might be unable to incorporate demand-side resources, such as customer load control (i.e., DR programs). This limitation can restrict the diversity of solutions available to LDCs
  - Revenue Offset Risks: Ownership of DERs means that LDCs would be responsible for managing risks tied to assumptions for revenue offsets (i.e., DER value to the wholesale market or directly to customers). These assumptions are made upfront during the development of the business case for the DER. For example, if a storage resource is used for energy arbitrage or providing operating reserves in the wholesale market, the LDC would need to manage the volatility and pricing risks associated with these market activities. In contrast, third-party providers might have more experience and competitive strategies to better navigate these risks
  - Need for Capability Development: To maximize the benefits of NWSs, LDCs must invest in developing their capabilities around DER operations. This includes acquiring knowledge and skills related to market integration, data management, and operational processes necessary to extract the full value of the assets. This development may require hiring or training personnel with specialized expertise

Challenges of LDC Ownership (2)

- More Challenges Include:
  - Market Competition: LDCs may find themselves in competition with specialized third-party providers of NWSs, who often have more experience and established relationships in the market. These third parties may be better positioned to innovate and adapt to market demands, creating competitive pressures for LDCs
  - Risk of Underutilization: There is a risk that owned NWS assets may be underutilized if they are not effectively integrated with existing infrastructure or if market conditions change. LDCs may find that their investments in NWSs do not deliver the anticipated benefits, resulting in sunk costs
  - DSO Operations: LDC ownership of NWSs could present potential conflicts if the LDC's business model evolves to include services as a DSO

Affiliate Non-Regulated Ownership of DERs: Overview

- Third-party DER ownership introduces distinct regulatory requirements, primarily depending on the asset type and size
  - Third-party owners may need to obtain an energy storage or generator license from OEB to operate legally in Ontario
  - While competitive providers offering behind-the-meter solutions are subject to fewer regulatory obligations, they must still adhere to consumer protection laws governing business practices in Ontario
  - Depending on the structure of their customer agreements, these providers might need a retail license to operate within certain regulatory parameters
- Recent OEB approvals have established a preliminary set of precedents that can provide useful guidance for future submissions, allowing LDCs some insight into potentially viable remuneration structures.
- Financial considerations:
  - Outsourcing DER services to third-party providers offers LDCs increased flexibility by enabling the deferment of substantial capital expenditures and allows LDCs to smooth out capital requirements over time and focus resources on immediate needs
  - Contracting with third parties introduces a risk of misaligning on the value of services, making it crucial for LDCs to establish clear metrics, such as "avoided costs," to justify investments in NWS
  - Using competitive procurement processes can further mitigate these risks by revealing fair market prices, helping LDCs secure value while maintaining operational efficiency and financial stability

Affiliate Relationship Code (ARC)

- The OEB's Affiliate Relationships Code (ARC) for Electricity Distributors and Transmitters sets out the standards and conditions for the interaction between electricity distributors and transmitters and their respective affiliated companies.
- This code sets out rules that govern the conduct of utilities as that conduct relates to their respective affiliates, with the objective of:
    - Protecting ratepayers from harm that may arise during dealings between a utility and its affiliate
    - Preventing a utility from cross-subsidizing affiliate activities
    - Protecting the confidentiality of information collected by a utility during provision of utility services
    - Ensuring there is no preferential access to utility services
    - Preventing a utility from acting in a manner that provides an unfair business advantage to an affiliate that is an energy service provider
    - Preventing customer confusion that may arise from the relationship between a utility and its affiliate

ARC Review

- The last review of the ARC occurred in 2010. The ARC rules have not changed significantly since Ontario's original market restructuring/opening in 2002, which were focused on electricity retail markets and competition
- Years of government policy interventions have largely eliminated retail competition in Ontario. Most small-volume customers now pay commodity rates set by the Ontario Energy Board (OEB)
- The current market bears little resemblance to the vision established in 2002. In Power Advisory's view, the Affiliate Relationships Code is not well-suited to address challenges posed by the energy transition and new utility business models
- Models like DSOs challenge traditional definitions of distribution systems and electricity distribution. The OEB has not clarified if DSOs could operate within regulated LDCs or require separation into unregulated affiliates, subject to the ARC
- Some DERs and NWSs enable more bespoke customer services. The OEB could consider these activities "non-utility" and mandate their operation through affiliates subject to the ARC
- The Electricity Distributors Association (EDA) has suggested that the Ministry of Energy and OEB:
  - Review and evaluate aspects of the ARC
  - Consider changes in light of policy direction, grid modernization, evolving energy markets, and new LDC functions and capabilities

Benefits of Affiliate Non-Regulated Ownership (1)

- Benefits for the LDC related to procurement of services from third-party NWS providers, include:
  - Access to Multiple Technologies: Third-party providers can offer a wider range of technologies, including load-side resources such as demand response and EV smart charging, which may not be feasible for LDCs to implement directly
  - Ability to Access Funding: Third-party providers are likely eligible for multiple funding sources and can manage the risks of these funding sources
  - Customer Engagement: Ability to engage with customers to provide potential solutions and deliver additional benefits to customers (i.e., bill savings)
  - Ability to Leverage Competitive Forces: Engaging multiple providers allows LDCs to discover the most cost-effective solutions, enhancing financial efficiency through competitive bidding
  - Utilization of Expertise and Existing Infrastructure: Third-party providers bring specialized expertise and established operational infrastructure, which can streamline implementation and reduce the learning curve for LDCs

Benefits of Affiliate Non-Regulated Ownership (2)

- More Benefits include:
  - Risk Management: Third parties assume responsibility for market risks and potential additional revenues, allowing LDCs to focus on their core operations without exposure to the complexities of market fluctuations
  - Short-Term Solutions: NWSs can be utilized for short-term needs during periods of demand uncertainty or while more comprehensive, long-term solutions are being developed
  - Flexibility and Scalability: LDCs can quickly scale services up or down based on demand without the need for significant capital investments in physical assets
  - Enhanced Speed of Deployment: Third-party providers often have the capacity to deploy solutions more quickly than LDCs could do on their own, enabling faster responses to changing market conditions or regulatory requirements
  - Innovation and Adaptation: Third-party providers are typically more agile and innovative, allowing LDCs to benefit from the latest technologies and solutions without the associated development risks
  - DSO Operations: The procurement of NWSs from third party providers is less likely to be inconsistent with future business models related to DSOs

Challenges of Affiliate Non-Regulated Ownership (1)

- Challenges for the LDC related to procurement of services from third-party DERs providers include:
  - Regulatory Remuneration Uncertainty: uncertainty regarding the regulatory framework for remuneration, which complicates approval process for funding models. The need to navigate new funding mechanisms potentially lead to delays or challenges in securing necessary financial support
  - Administrative Burden: Engaging with third-party providers adds an administrative layer to the procurement process. LDCs must manage contracts and service agreements, which takes time and requires additional resources for compliance
  - Specification of Service Requirements: LDCs are responsible for clearly defining and specifying the exact service requirements in contracts with third parties. This necessity can lead to challenges in articulating technical specifications and performance expectations, increasing the potential for disputes or misinterpretations
  - Loss of Direct Control: LDCs have less direct control over the operations and management of the assets which can lead to challenges in ensuring that services are delivered as required

Challenges of Affiliate Non-Regulated Ownership (2)

- More challenges include:
  - Service Availability and Conflicts of Interest: LDCs need to ensure that third-party services are readily available when needed. There is potential for conflicts of interest, especially if the NWS owner simultaneously provides services to the LDC's customers or the wholesale market, which could complicate service delivery and prioritization.
  - Geographic Limitations of Providers: Existing DER solution providers may not operate in areas where the NWS is required. This geographical mismatch can limit the availability of suitable service providers, potentially delaying implementation or necessitating longer procurement processes.
  - Performance and Reliability Variability: There is a risk that third-party providers may not consistently deliver high-quality performance or reliability. Variability in service delivery can impact the overall effectiveness of the NWS, potentially leading to missed opportunities for demand response or energy savings.

Review of NWS Pilot Programs

Essex Powerlines Project Overview

- The Essex Powerlines' (EPLC) PowerShare Project focuses on enabling DER owners to sell excess generation or curtail demand to address local grid constraints. This is part of a DSO pilot that creates a local market for DER services to improve grid flexibility
- The project aims to explore the integration of DERs like solar, energy storage, and electric vehicle charging into the grid to manage peak demand, improve reliability, and provide localized energy solutions. The project received funding from NRCan's Smart Grid Fund
- Regulatory challenges: obtaining approval for integrating DERs, managing customer interactions, aligning utility revenue models with DER integration since the current regulatory framework supports traditional infrastructure investments over NWSs
- Project outcomes and key takeaways:
    - Demonstrated how DERs can provide localized energy services and improve grid resilience
    - Potential for peak load reduction and a better understanding of how DERs can complement traditional grid asset
    - Highlights importance of communication infrastructure and real-time data in managing DERs effectively
    - Need for regulatory flexibility to fully realize the benefits of DERs and align incentives for utilities and consumers
    - Customer engagement plays a critical role in encouraging DER adoption

Alectra Utilities Project Overview

- The IESO and Alectra Utilities conducted a demonstration ("the Demonstration") in York Region to explore using DERs as NWSs to traditional infrastructure like poles, wires, and transformers
- The project, funded by the IESO and NRCan, ran local auctions to provide services at both the distribution and transmission levels
- The demonstration took place in Richmond Hill, Markham, and Vaughan over two operational years (May to October, 2021 and 2022)
- The evaluation confirmed the success of the project, validating DERs as viable NWAs for local energy and capacity needs
- Some key project outcomes include:
    - Participation from various types of participants (residential, commercial, and industrial load customers, as well as aggregators) and DER technologies significantly exceeded the capacity targets for procurement
    - Successfully securing the targeted level of local capacity and energy services (as well as local reserves) from DERs

Alectra Utilities Project Takeaways

- The results from the project suggests that strategically targeting procurement of services from DERs in areas where they can provide multiple benefits can be highly advantageous
- The analysis compared the avoided costs in generation, transmission, and distribution with the costs of procuring DERs across three scenarios: Slow Growth, Base Case, and High Growth
- Significant value can be realized in High Growth scenarios with more favorable DER inputs and assumption
- The evaluation findings have limited broader applicability due to several factors:
  - The participating DERs were largely existing, meaning observed prices aren't indicative of future deployment costs
  - The high value of DERs in York Region is specific to its infrastructure needs and unlikely to be replicated in other areas; the demonstration involved a relatively small amount of capacity (10-15 MW), so the availability of DERs for larger projects needs further investigation
  - The evaluation offers an illustrative BCA, without assessing current planning options, timelines, or risks
- Feedback from participants included:
  - Receiving longer advance notification of activations would be beneficial for load curtailment DERs
  - Allowing aggregators to more easily access customer meter data from Alectra could simplify the settlement process
  - Participants expressed interest in more flexibility for baselining methodologies tailored for their type of DER
  - A longer pilot duration (e.g., five years) would allow participants to plan and commit more resources

Toronto Hydro Project Overview

- Toronto Hydro (TH) has conducted two pilot projects for local demand response:
    1. A project operating between 2015 and 2019 at Cecil TS in downtown Toronto
        - The Cecil TS project was the first NWS in Ontario approved to be implemented through distribution rates
        - Project outcomes:
            - Demonstrated that NWS could defer upgrades in a constrained part of a distribution system
            - TH claimed that the demand response and backup generators deployed deferred $30 million in capital upgrades
            - TH learned that an NWS is particularly valuable for providing planning flexibility in scenarios where investment needs are uncertain and may not materialize
    2. An ongoing project which started in 2020 at Manby TS and Horner TS in Etobicoke.
        - In the 2020-2024 rate period, Toronto Hydro's efforts in local demand response shifted to Manby TS and Horner TS
        - In addition to distribution system needs and load transfer requirements, the IESO had identified transmission capacity constraints in the same area starting in 2021; an enduring transmission solution could not be implemented until 2025, so short-term solutions were needed to reduce transmission-level reliability risk
- After the successful pilot projects, larger scale NWS programs were planned in their 2025-2029 distribution rate application; TH applied to procure "up to 30 MW of demand response capacity" to defer or avoid $10 million of capital expenditures at a projected cost of about $5.7 million.

Toronto Hydro Lessons Learned

- Based on experience in its eight years of operating local demand response programs, TH has identified key risks and lessons learned:
  - Low participation in a procurement is possible if programs are overly complex, if development timelines are too short, or if target areas and quantities are too small
  - TH anticipates that the existing DER capacity and relatively large target capacity will mitigate the risk of low participation in the 2025-2029 local demand response program
  - Designing incentives for local demand response services (i.e. capacity payments, energy payments, non-performance penalties, etc.) is also challenging
  - TH plans to further experiment with price discovery and incentive design in future demand response programs while monitoring industry best practices
  - As programs have expanded, TH has also noted an increasing need for a centralized platform – as part of an Advanced Distribution Management System – to monitor, control, and dispatch DERs like demand response

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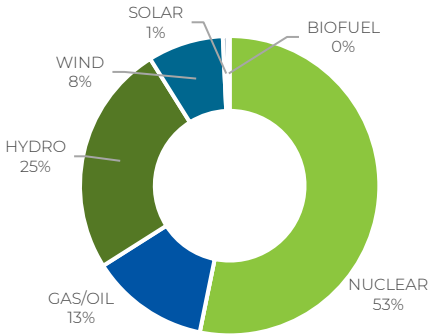
Appendix 1: Wholesale Market Overview and Participation

Overview of Ontario's Electricity Market

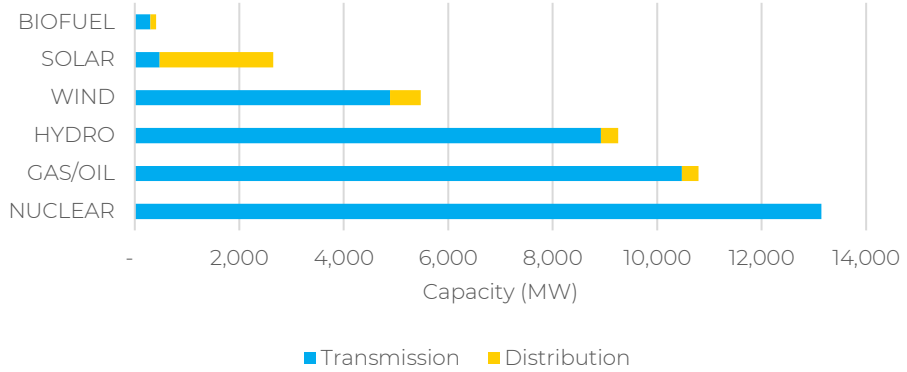
- Ontario has what is known as a 'hybrid' market structure, with electricity prices derived from three components:
  - The hourly wholesale electricity market operated by the Independent Electricity System Operator (IESO), which dispatches resources and sets wholesale prices
  - Supply contracts with IESO and (to a much lesser extent) the Ontario Electricity Financial Corporation (OEFC) that provide fixed payments to generators
  - Rate-regulated generation owned by Ontario Power Generation (OPG), a provincial crown corporation
- Wholesale electricity prices are mainly composed of the Hourly Ontario Energy Price (HOEP) and Global Adjustment (GA), with an additional minor component related to capacity payments from the IESO-led annual capacity auction
  - The GA is a funding mechanism for supply contracts and rate-regulated assets – it acts as a capacity payment to generators to make them financially whole when market revenues are insufficient (i.e., difference between contract price and market price)
  - Allocation of GA to customers varies by customer type; some ("Class A" customers, mainly large industrial facilities) are allocated GA based on their contribution to system peak demand, known as the Industrial Conservation Initiative (ICI); this has led many such customers to install BTM generation or storage to reduce their contribution to system peaks
- Most importantly, **Ontario's grid is largely a fixed-cost system,** as nearly all generators are guaranteed full recovery of fixed and operating costs through the combination of wholesale revenues and GA payments
  - Any decline in wholesale market prices are largely offset by an increase in GA costs (i.e. they are inversely related)

Ontario Supply Mix

2023 Annual Energy Production – IESO Market Participants



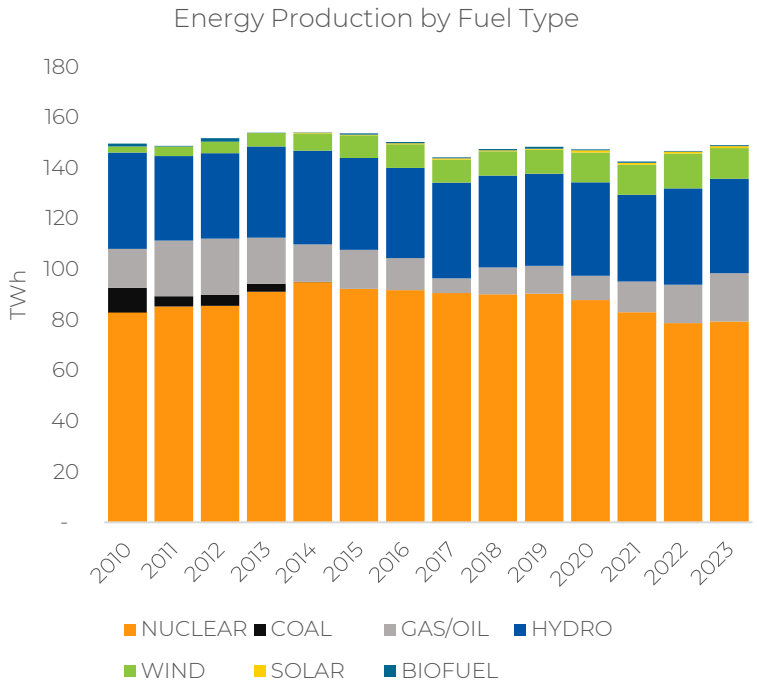
Installed Capacity 2023



- Nuclear generation is the largest supply resource and is responsible for over half of the province's annual energy production (excluding embedded generation)
- Note that the large amount of solar-connected capacity was procured in previous procurements led by the IESO and the former contracting agency, Ontario Power Authority (OPA)
- See the following slide for output by fuel type in TWh

Historical Ontario Energy Production

- Over 90% of Ontario's generation comes from non-emitting resources; nuclear and hydropower dominate the supply mix
- Wind power has grown from 0 MW in 2009 to about 5.4 GW in 2022 and was responsible for almost 14 TWh of electricity production in 2022
- Gas-fired generation is used for intraday generation purposes, although the oversupply situation over the past decade has seen the more than 9,000 MW of installed capacity underutilized compared to other jurisdictions
- Ontario is undertaking a significant nuclear refurbishment program of its nuclear generation fleet at Darlington Nuclear Generation Station (Darlington) and Bruce Power Nuclear Generating Station (Bruce) that will keep them in operation until the 2060s
    - 10 units totaling 8.4 GW will be refurbished by 2033
- All four Pickering B units are expected to enter refurbishment after September 2026 and return to service in mid-2030s with ~2,000 MW capacity

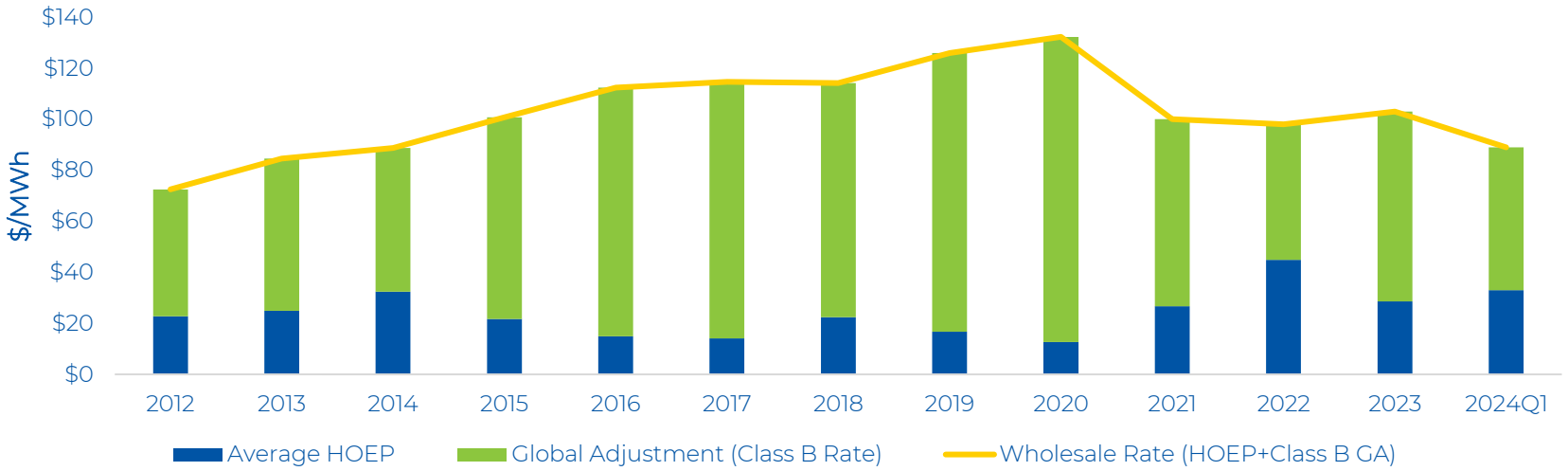


Ontario Wholesale Electricity Price Components

The effective wholesale electricity market price in Ontario is the combination of the commodity portion (i.e., HOEP) and GA	
HOEP	• Non-dispatchable loads and loads connected through a distribution network are charged HOEP (HOEP is the arithmetic average of the 12 MCPs for a respective hour) • Prices are sometimes negative (i.e., consumers withdrawing electricity from the grid are reducing their electricity bill, not increasing it), particularly when demand is low and the output of non-schedulable resources is high
GA	• The GA is unique to Ontario's electricity market • The provincial government, through its agencies such as OPG, the IESO and the OEFC, has made commitments to a wide variety of payments to nuclear, hydro, gas and renewable generators, as well as conservation and demand management programs mainly through electricity supply contracts • Note that capacity payments are also recovered by the IESO from customers using a similar method as GA costs for customers

- Once the Market Renewal Project (MRP) is implemented there will no longer be a provincial wide uniform price for generators
- Instead, generators will be paid a Locational Marginal Price (LMP) for their supply (as discussed in later slides)

Historical Energy Pricing in Ontario



- Gas prices have returned to the $2 to $4/MMBtu range that prevailed for much of the 2010s
- HOEP remains higher than the 2015-2020 average – reflecting tightening supply and reduced surplus baseload generation (see previous slide on gas supply) – but lower than the very high prices experienced throughout 2022 (the highest average wholesale price in over a decade)
- The combined wholesale electricity rate appears to have returned to its upward trend

Market Participation: Overview

- The IESO requires generators and consumers to register as Market Participants (MPs) to participate in any of the IAMs including the real-time energy market, capacity auction, and ancillary services market
- MPs have the obligation to meet the processes and procedures of the IESO market rules
- All generators and consumers connected to the IESO-controlled grid (i.e., transmission system or directly to a transmission station) must be MPs
- Embedded generation and consumers (i.e., generation and consumers connected within the distribution system) can voluntarily become a MP to participate in the IESO electricity market, but typically do not register to become IESO MPs
- Under current market rules, resources must be at least 1 MW to participate in the IESO-administered wholesale markets; this threshold may be lowered to 0.1 MW as part of the IESO's forthcoming DER Market Design Project

Market Participation: Load Customers

- There are three possible participation models for loads (including loads with behind-the-meter resources): non-dispatchable, price-responsive, and dispatchable
- Non-dispatchable loads generally do not take part in the energy or operating reserve markets, but they can provide capacity as an hourly demand response (HDR) resource.
- With upcoming changes to the energy market as part of the Market Renewal Program, the IESO will introduce a day-ahead energy market and a new price-responsive load participation model that enables day-ahead participation only.
    - Participating in the day-ahead energy market would allow the load to bid a price above which it will not be willing to consume energy and to effectively lock in those prices prior to the real-time market
- Participating as a dispatchable load enables participation in real-time energy and operating reserve markets, which comes with considerably greater operational complexity and higher expectations from the IESO.

Market Participation: Operational Complexity

- Participating in the real-time market would require significantly more time, cost, and complexity than HDR participation
- For example, market registrants need to demonstrate to the IESO:
  - Working telemetry to provide real-time meter data
  - That the facility can respond to IESO control signals
  - "Trained staff capable of submitting dispatch data" who can be reached by phone
  - Connection to various IESO digital tools/interfaces
- On an ongoing basis, provide day-ahead and real-time information (price and quantity) to the IESO and monitor for dispatch instructions
  - An operating reserve activation could occur at any time, and the load would need to be curtailed within the prescribed timelines (10 minutes or 30 minutes)
- There is currently only about 200 MW of dispatchable load regularly providing operating reserve – most of these participants are large, sophisticated energy consumers (pulp and paper mills, steel manufacturers and so on)
- IESO will sanction failures to comply with dispatch instructions and other procedures
  - See the IESO Market Rules and Manuals for more, particularly Market Rules Chapter 2, Market Manual 1.5, Market Manual 4.3, and Market Manual 6

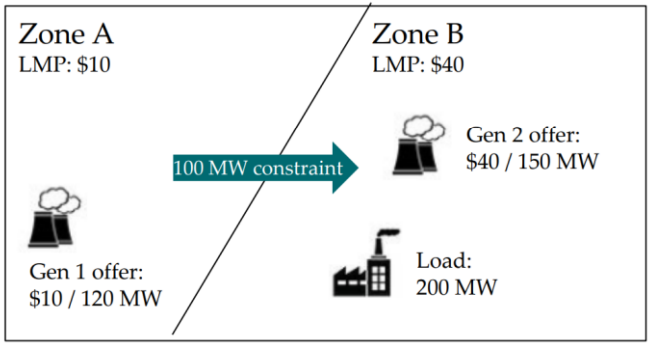
Market Renewal Program (MRP)

- IESO's Market Renewal Program (MRP) consists of the following three initiatives:
    1. Replace the two-schedule market with a single schedule market (SSM) to address current misalignments between price and dispatch and to better reflect the true cost of dispatching resources.
    2. Introduce a day-ahead market (DAM) to provide greater operational certainty to the IESO and greater financial certainty to market participants, ensuring more efficient scheduling of resources to meet anticipated system needs.
    3. Reduce the cost of scheduling resources to meet demand as it changes from the day-ahead to real-time through the enhanced real-time unit commitment (ERUC) initiative.
- The renewed market is scheduled to launch on May 1, 2025

Why is the IESO implementing MRP?

Attempt to address inefficiencies with the current IAM two schedule system

Example:



IESO Status Quo:
Market Clearing Price = $40
Constrained-off payments = 20 x ($40-$10)

- In addition to efficiency gains, the IESO is also addressing aging scheduling, dispatch, settlement and IT systems

- IESO's current market design (i.e., Two-Schedule Market) is unique to North America; the current market design was originally adopted at market opening with the assumption that it would be temporary and replaced within 18-months (e.g., to ease transition)
  - Unconstrained system sets MCP for each dispatch interval and does not include internal transmission constraints (e.g., transfer capacity between zones) or operating constraints (e.g., ramping requirement)
  - The constrained system sets schedules (i.e., which resources should produce or consume electricity for a dispatch interval) and determines shadow prices for different nodes in the system

Divergence of constrained schedule vs. unconstrained schedules leads to out-of-market payments and ineffective price signals for generators & loads

  - Participants seek to maximize out-of-market payments instead of market efficiencies; gaming difficult to identify and remedy

- Market design changes required for Single Schedule Market (SSM) enhance benefits of DAM
  - Implementation of DAM provides greater operational and financial certainty for wholesale market through scheduling of required resources for system needs

Energy and Operating Reserve Pricing Post-MRP

- Market participants will provide hourly dispatch data in the form of offers and bids for energy and operating reserve into the day-ahead and real-time markets.

- Day Ahead Market (DAM): The DAM process will require that market participants for all dispatchable loads, dispatchable and self-scheduling generation facilities, price responsive loads, virtual traders and importers and exporters submit dispatch data between 06:00 EPT and 10:00 EPT that reflects the expected capabilities of these resources prior to the close of the DAM bidding window (at 10:00 EPT). Hourly schedules, commitments and locational marginal prices will be produced for the 24 hours of the next dispatch day as an output of the DAM, and results will be posted by approximately 13:30 EPT.
    - Virtual traders and price responsive loads (PRLs) are introduced as new participation types in the DAM. Price responsive loads (PRLs) will be able to participate directly in the DAM by submitting bids for energy, but will continue to be non-dispatchable in real-time.

- Operating Reserve: Thirty-minute operating reserve for flexibility will also be scheduled as an input into the DAM calculation engine to accurately reflect anticipated needs and to avoid introducing known differences between the DAM and RT.

- Real-Time Market (RT): The RT scheduling process occurs within the dispatch hour. During every dispatch hour, the dispatch algorithm runs every five minutes. This five-minute interval is the dispatch interval and used to determine real-time prices and operating schedules. It then sends dispatch instructions to dispatchable facilities at the start of the next interval, indicating the operating point that needs to be reached by the end of that dispatch interval. Five-minute clearing prices will be locational marginal prices instead of the uniform market clearing prices (MCP) of today.

MRP's New Two-Settlements for Dispatchable Resources

- With the introduction of DAM, dispatchable generators, dispatchable loads and price responsive loads (PRLs) are subject to two-settlements
  - PRLs are a new market participant load type introduced in MRP that participate in DAM but are non-dispatchable
- DAM schedule quantity is financially-binding, as Market Participants must pay for their scheduled quantity at the DAM price
- Settlement in real-time market (RTM) balances deviations between DAM quantity scheduled and actual withdrawal/injection
- *Renewable generators will need to manage their DAM-to-RT risk, as they will have to buy-out (be paid) for hours when the under (over) generator in RT – although many contracts with the IESO will protect generators from this risk*

DAM Settlement		RTM Balancing Settlement
$Q_{DAM} \times \$_{DAM\_LMP}$	+	$(Q_{RTM} - Q_{DAM}) \times \$_{RTM\_LMP}$
DAM quantity scheduled multiplied by DAM LMP		Actual quantity withdrawn in RTM minus DAM quantity scheduled, all multiplied by RTM LMP

MRP Settlement for Non-Dispatchable Loads

- IESO continues to forecast Non-Dispatchable Load (NDL) demand, and NDLs will not have DAM participation requirements
- NDLs will continue to have uniform pricing across Ontario, however, they will be subject to a modified two-settlement calculation
- The uniform price, which replaces the current HOEP, is based on the DAM Ontario Zonal Price (DAM_OZP) plus the Load Forecast Deviation Charge (LFDC)
    - DAM Ontario Zonal price represents the average DAM LMPs across the province in each hour
    - The LFDC is a true-up factor that accounts for the difference between the NDL DAM forecast and the actual NDL consumption in the RTM, and the difference between DAM LMPs and RTM LMPs

$$AQEW \times (DAM\_OZP + LFDC)$$

Actual amount of energy withdrawn in RTM multiplied by the DAM Ontario Zonal Price plus the Load Forecast Deviation Charge

- For non-IESO market participants (i.e., most distribution connected customers) it is expected that the OEB will replace HOEP with "DAM_OZP + LFDC"

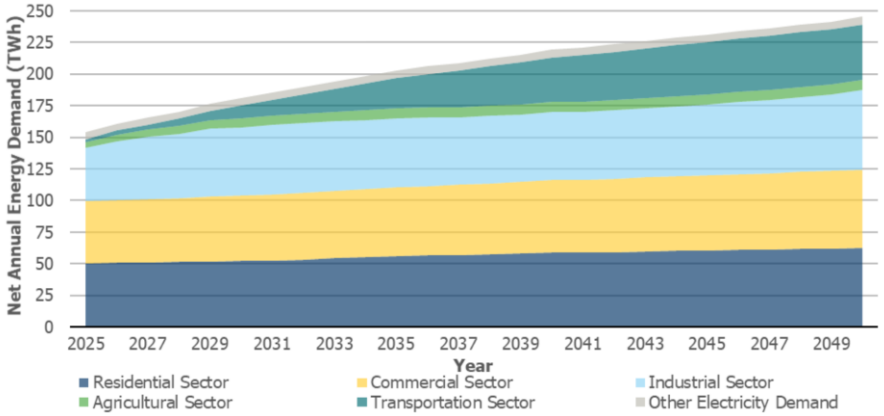
Appendix 2: Wholesale Market Outlook

Electricity Market Outlook

- Ontario's supply needs over the next few decades are expected to increase rapidly due to broad electricity demand growth and replacement of thermal energy output
- Ontario's plan for long-term supply (i.e., into the 2040s) focuses on the construction of new nuclear generation and ongoing refurbishment of existing nuclear generation units
- Remaining new supply needs are expected to come from renewable generation resources (i.e., wind and solar); however, the value of existing renewable resources exceeds the construction of new renewables due to various challenges in the Ontario electricity market
    - Transmission capacity is constrained with many areas of the province unable to accommodate new generation supply without enhancements or upgrades due to thermal and short-circuit current limitations
    - Through government policy and procurement design, new projects must secure community acceptance and support which may be difficult given Ontario's contentious history with renewable generation projects
    - New generation projects must enter service during a period of significant market design changes through the IESO's Market Renewal Program; current contract design from the IESO shifts many new market risks to proponents that were not applied in previous new energy procurements

2024 APO – Demand Growth

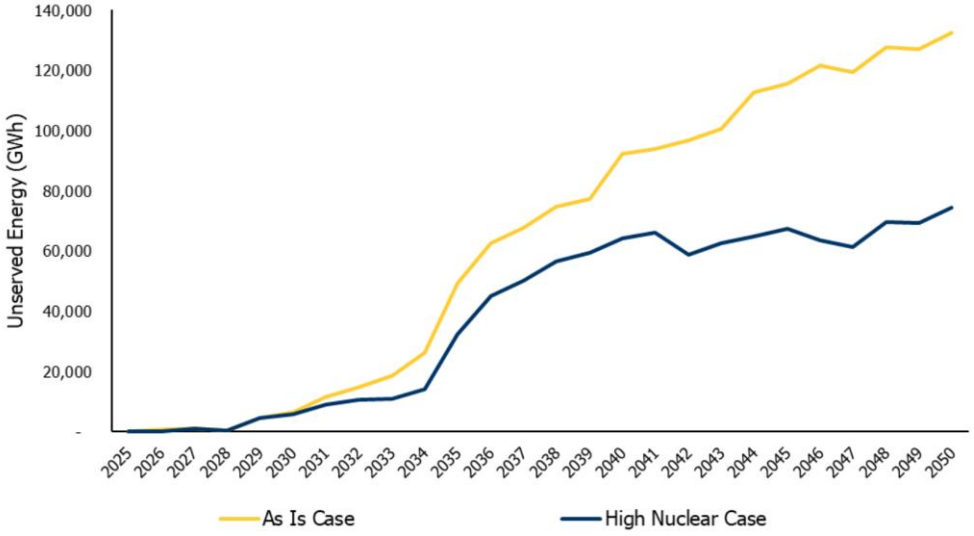
- Significant demand growth is forecasted, owing to mining, steel production, adoption of EVs, and EV manufacturing
- Ontario demand is forecast to increase from 154 TWh in 2025 to 245 TWh in 2050 – a 59 percent increase over 25 years, with an average annual growth rate of 1.9 percent
- IESO projects a transition from a summer-peaking electricity demand pattern to dual seasonal peaks by the early 2030s
    - Net peak demands for summer and winter seasons are expected to see average annual growth rates of 1.4% and 1.7%, respectively
- Demand growth forecast in 2024 APO is more conservative than in Pathway to Decarbonization (P2D) report issued by IESO in 2022
    - P2D assumed a switch from gas to all-electric heating over the forecast period while Power Advisory views hybrid heating as a likelier solution with demand growth between 2024 APO and P2D forecasts over the long-term
- Changing demand patterns and customer behaviour will require continued adaptation and planning to ensure reliability



APO 2024: Forecast energy demand growth

2024 APO – Resource Adequacy

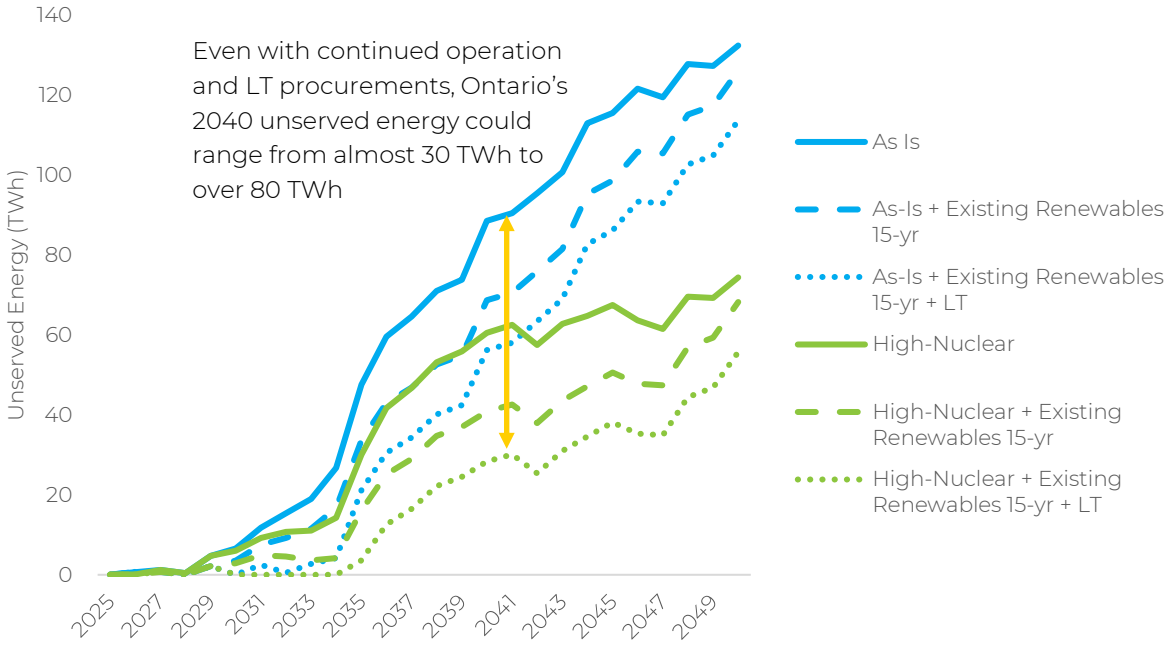
- There continues to be a growing resource adequacy need in Ontario as demand grows and resources reach the end of their commitment period
    - As in past forecasts, an energy gap emerges starting in 2029
    - The magnitude of the energy adequacy gap will depend on resource availability following contract expiry, as well as success in ongoing acquisition of new energy resources
- Even with continued operation of existing resources (e.g., existing renewable generation) to the end of their operating life (i.e., until repowering or capital sustainment investment is required) and the High Nuclear case, Ontario has a growing need for new energy
    - LT2/LT3/LT4 procurements are meant to help start addressing these needs



APO 2024: Potential unserved energy

2024 APO – Resource Adequacy With Continued Operation of Renewables

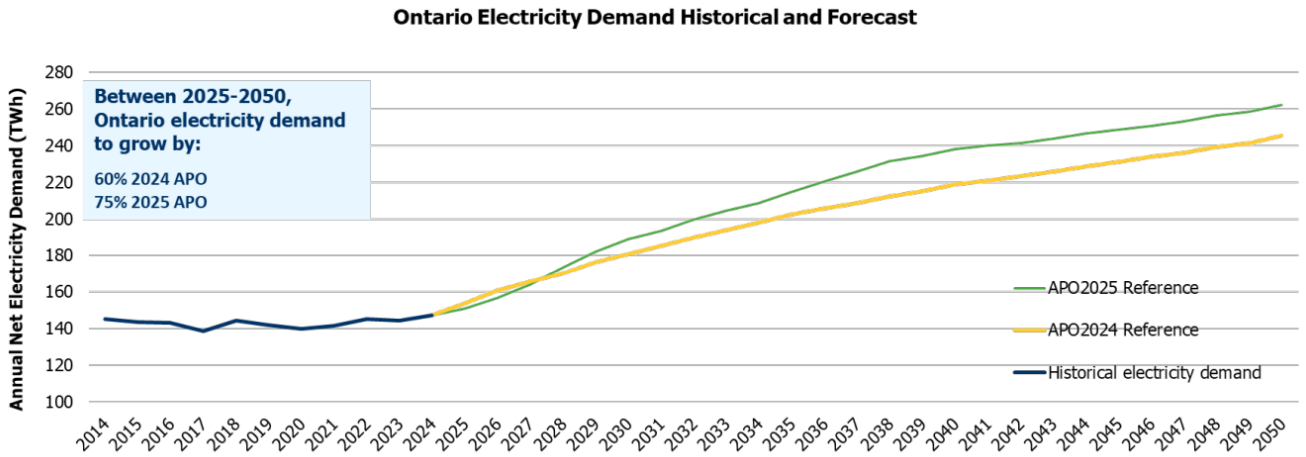
- Even with continued operation of existing renewable generation to the end of their operating life (i.e., a further 15 years) Ontario has a growing need for new energy
- LT2 procurements are meant to help start addressing these needs but still only slow the progress of the looming energy shortfall
- The current government has made nuclear capacity a key component of the province's future energy mix and has publicly discussed turning Ontario into an "energy super power"



APO 2024: Potential unserved energy with continued operation assumptions by Power Advisory

2025 APO – Demand Growth

- IESO released its 2025 Demand Forecast on October 16, 2024; the next APO is expected in Q1 2025
- The revised forecast is for a 75% increase by 2050, which is a 15% increase in demand relative to the 2024 APO forecast
- Drivers for the increase in demand growth include industrial load, data centres, and electrification
- See Power Advisory commentary for more details



Primary Factors Influencing Wholesale Electricity Prices

- Tight supply conditions: Due to increasing demand and refurbishment of nuclear generation units, increasingly tight supply conditions are expected. This is expected to increase energy and capacity prices, particularly in the period before Ontario can bring significant new supply into service. GA rates will likely decrease in response to increasing HOEP as Ontario's grid is largely a fixed-cost system

- Government Policy and Regulatory Outlook: Federal policy on carbon pricing can influence the variable cost of gas resources and energy pricing. Similarly, industrial policy and immigration policy can impact demand growth. Provincial electricity policy can impact new resource construction – particularly new nuclear – and overall supply in the market. OEB has initiated several initiatives to speed up customer connections which can impact demand growth

- New Large Step Loads: There is an increase in large industrial and commercial loads (e.g. EV manufacturing, data centres) that are planning to connect to the electricity system. There is some uncertainty with the magnitude and timing of demand growth from such customers

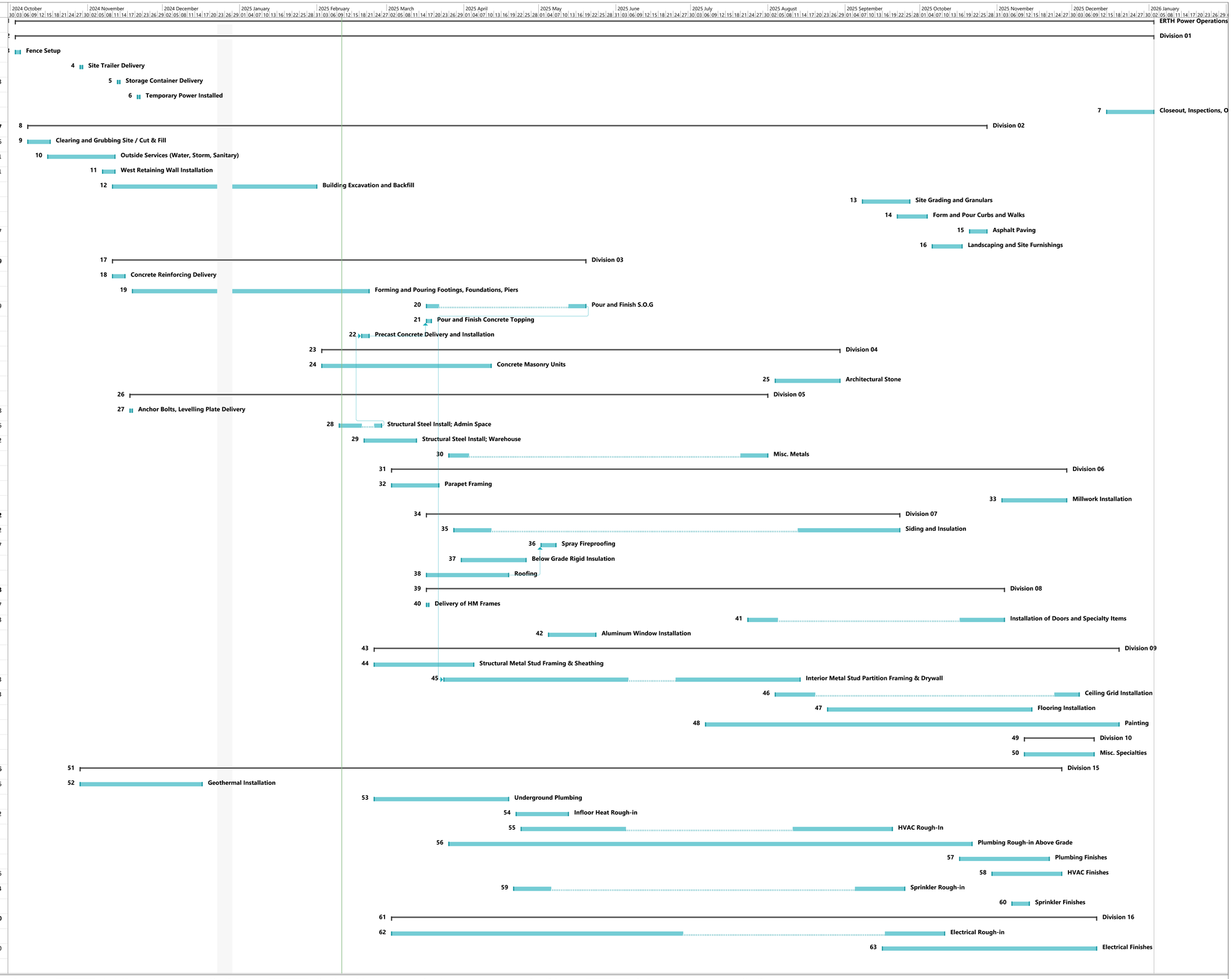
- New Supply: The IESO has completed a number of competitive procurements and is transitioning to an annual cycle of capacity and energy procurements with standardized contracts on both long and medium-term structures for new and existing assets. There is also a construction of new nuclear generation

- In general, there is significant energy policy and wholesale electricity market uncertainty in 2025, with Ontario's first Integrated Energy Resource Plan, a new iteration of the Annual Planning Outlook, IESO's first energy procurement in over a decade, the launch of IESO's Market Renewal Program (MRP), a federal election, potential for a provincial election

Attachment 5

JT1.11 – Bronnenco Construction
Schedule

ID	Task Name	Duration	Start	Finish
1	**ERTH Power Operations Hub**	**322 days**	**Thu 24-10-03**	**Fri 26-01-02**
2	**Division 01**	**322 days**	**Thu 24-10-03**	**Fri 26-01-02**
3	Fence Setup	2 days	Thu 24-10-03	Fri 24-10-04
4	Site Trailer Delivery	1 day	Tue 24-10-29	Tue 24-10-29
5	Storage Container Delivery	1 day	Wed 24-11-13	Wed 24-11-13
6	Temporary Power Installed	1 day	Thu 24-11-21	Thu 24-11-21
7	Closeout, Inspections, Occupancy Review	15 days	Mon 25-12-15	Fri 26-01-02
8	**Division 02**	**270 days**	**Tue 24-10-08**	**Mon 25-10-27**
9	Clearing and Grubbing Site / Cut & Fill	7 days	Tue 24-10-08	Wed 24-10-16
10	Outside Services (Water, Storm, Sanitary)	19 days	Wed 24-10-16	Mon 24-11-11
11	West Retaining Wall Installation	3 days	Thu 24-11-07	Mon 24-11-11
12	Building Excavation and Backfill	55 days	Mon 24-11-11	Fri 25-01-31
13	Site Grading and Granulars	15 days	Mon 25-09-08	Fri 25-09-26
14	Form and Pour Curbs and Walks	10 days	Mon 25-09-22	Fri 25-10-03
15	Asphalt Paving	5 days	Tue 25-10-21	Mon 25-10-27
16	Landscaping and Site Furnishings	10 days	Mon 25-10-06	Fri 25-10-17
17	**Division 03**	**131 days**	**Mon 24-11-11**	**Mon 25-05-19**
18	Concrete Reinforcing Delivery	5 days	Mon 24-11-11	Fri 24-11-15
19	Forming and Pouring Footings, Foundations, Piers	64 days	Tue 24-11-19	Fri 25-02-21
20	Pour and Finish S.O.G	10 days	Mon 25-03-17	Mon 25-05-19
21	Pour and Finish Concrete Topping	2 days	Mon 25-03-17	Tue 25-03-18
22	Precast Concrete Delivery and Installation	3 days	Wed 25-02-19	Fri 25-02-21
23	**Division 04**	**150 days**	**Mon 25-02-03**	**Fri 25-08-29**
24	Concrete Masonry Units	50 days	Mon 25-02-03	Fri 25-04-11
25	Architectural Stone	20 days	Mon 25-08-04	Fri 25-08-29
26	**Division 05**	**179 days**	**Mon 24-11-18**	**Thu 25-07-31**
27	Anchor Bolts, Levelling Plate Delivery	1 day	Mon 24-11-18	Mon 24-11-18
28	Structural Steel Install; Admin Space	10 days	Mon 25-02-10	Wed 25-02-26
29	Structural Steel Install; Warehouse	15 days	Thu 25-02-20	Wed 25-03-12
30	Misc. Metals	15 days	Wed 25-03-26	Thu 25-07-31
31	**Division 06**	**195 days**	**Mon 25-03-03**	**Fri 25-11-28**
32	Parapet Framing	15 days	Mon 25-03-03	Fri 25-03-21
33	Millwork Installation	20 days	Mon 25-11-03	Fri 25-11-28
34	**Division 07**	**136 days**	**Mon 25-03-17**	**Mon 25-09-22**
35	Siding and Insulation	40 days	Fri 25-03-28	Mon 25-09-22
36	Spray Fireproofing	4 days	Fri 25-05-02	Wed 25-05-07
37	Below Grade Rigid Insulation	20 days	Mon 25-03-31	Fri 25-04-25
38	Roofing	25 days	Mon 25-03-17	Fri 25-04-18
39	**Division 08**	**166 days**	**Mon 25-03-17**	**Mon 25-11-03**
40	Delivery of HM Frames	1 day	Mon 25-03-17	Mon 25-03-17
41	Installation of Doors and Specialty Items	20 days	Thu 25-07-24	Mon 25-11-03
42	Aluminum Window Installation	15 days	Mon 25-05-05	Fri 25-05-23
43	**Division 09**	**215 days**	**Mon 25-02-24**	**Fri 25-12-19**
44	Structural Metal Stud Framing & Sheathing	30 days	Mon 25-02-24	Fri 25-04-04
45	Interior Metal Stud Partition Framing & Drywall	90 days	Mon 25-03-24	Wed 25-08-13
46	Ceiling Grid Installation	20 days	Mon 25-08-04	Wed 25-12-03
47	Flooring Installation	60 days	Mon 25-08-25	Fri 25-11-14
48	Painting	120 days	Mon 25-07-07	Fri 25-12-19
49	**Division 10**	**20 days**	**Wed 25-11-12**	**Tue 25-12-09**
50	Misc. Specialties	20 days	Wed 25-11-12	Tue 25-12-09
51	**Division 15**	**277 days**	**Tue 24-10-29**	**Wed 25-11-26**
52	Geothermal Installation	35 days	Tue 24-10-29	Mon 24-12-16
53	Underground Plumbing	40 days	Mon 25-02-24	Fri 25-04-18
54	Infloor Heat Rough-in	15 days	Tue 25-04-22	Mon 25-05-12
55	HVAC Rough-In	60 days	Thu 25-04-24	Fri 25-09-19
56	Plumbing Rough-in Above Grade	150 days	Wed 25-03-26	Tue 25-10-21
57	Plumbing Finishes	26 days	Fri 25-10-17	Fri 25-11-21
58	HVAC Finishes	20 days	Thu 25-10-30	Wed 25-11-26
59	Sprinkler Rough-in	25 days	Mon 25-04-21	Wed 25-09-24
60	Sprinkler Finishes	5 days	Fri 25-11-07	Thu 25-11-13
61	**Division 16**	**203 days**	**Mon 25-03-03**	**Wed 25-12-10**
62	Electrical Rough-in	103 days	Mon 25-03-03	Fri 25-10-10
63	Electrical Finishes	62 days	Tue 25-09-16	Wed 25-12-10
64				



Project: ERTH Power - Construc
Date: Tue 25-02-11

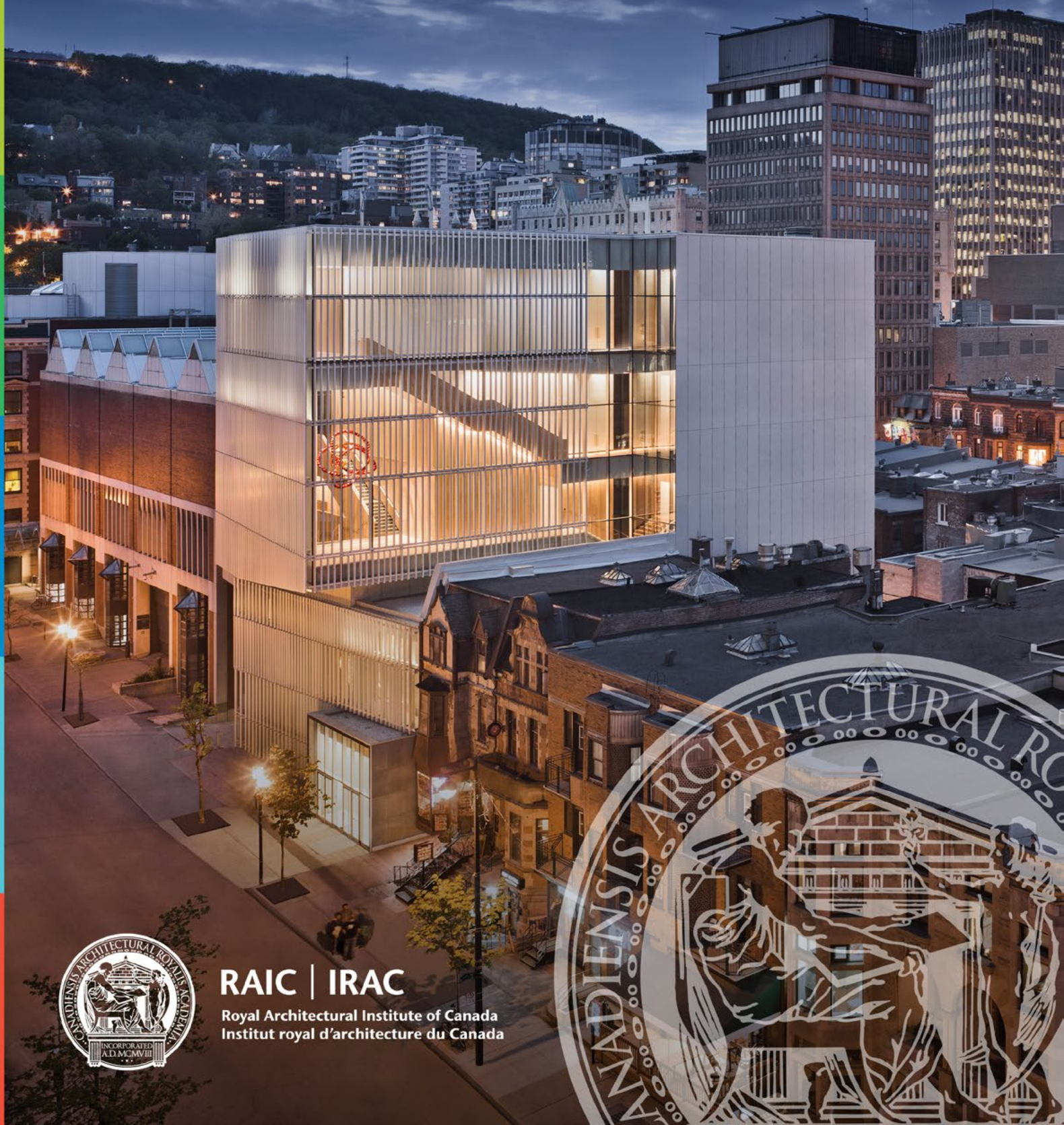
Task · Split · Milestone · Summary · Project Summary · Inactive Task · Inactive Milestone · Inactive Summary · Manual Task · Duration-only · Manual Summary Rollup · Manual Summary · Start-only · Finish-only · External Tasks · External Milestone · Deadline · Progress · Manual Progress

Attachment 6

JT1.12 – RAIC Guide

A GUIDE TO

Determining Appropriate Fees for the Services of an Architect



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RAIC Practice Support Committee Members (2016, 2017, and 2018)

John Peterson, FRAIC, Chairperson

Rod Kirkwood, FRAIC, former Chairperson

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Joseph Zareski, MRAIC

Jon Hobbs, FRAIC, former RAIC Executive Director, laid the groundwork for the original document, *A Guide to Determining the Appropriate Fees for the Services of an Architect*, making this 2nd Edition possible. With much appreciation, *thank you*.

The RAIC is also thankful for input from the practice committees and practice advisors of the provincial associations of architecture, particularly Charles (Chuck) Greenberg, FRAIC, and Allen Humphries, FRAIC, of the Ontario Association of Architects. All of the comments provided have been thoughtful and instructive.

Donald Ardiel, MRAIC, Editor

COVER IMAGE

MICHAL AND RENATA HORNSTEIN PAVILION FOR PEACE
Atelier TAG + Jodoin Lamarre Pratte architectes en consortium
Photo: Marc Cramer

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Preface

This guide has been developed by the Royal Architectural Institute of Canada (RAIC) to assist Architects and their clients in determining a fair exchange for the value of architectural services.

Throughout the second half of the 20th Century, expectations and roles within the design and construction industry were consistent and clearly understood. Architects' services for any building project were largely the same and builders generally performed in a consistent manner based on a standard set of conventions and procedures. Therefore, it was relatively easy to identify a typical fee for the services of an architect for a specific type of building. A schedule of fees for architectural services based on a percentage of the construction cost was widely accepted and used.

Today the situation has changed. Professional architectural service firms in Canada are bound to operate under laws, regulations, and standards governing human resources management, professional regulatory frameworks, building construction market conditions, and evolving digital technologies, among others. It is necessary to examine every building project to determine the appropriate fee for an architect's services. The practice of architecture and the provision of architectural services have evolved considerably. Today, the architect and client must agree upon a wide range of project requirements and negotiate a fair exchange for value based on the unique aspects of each project. Some of the reasons for this include:

- Widely differing requirements of Authorities Having Jurisdiction and approval processes based on building type and jurisdiction;
- Increasingly complex and sophisticated building systems and technologies;
- Different forms of project delivery;
- Project phasing with multiple building occupancies at various times;
- Numerous additional specialists to consult and coordinate;
- Additional or reduced levels of services depending on the project-specific context and its method of delivery;
- Wide variations in construction costs;
- New project design and documentation processes and requirements such as Building Information Modeling (BIM), Integrated Project Delivery (IPD), or Integrated Design Process (IDP);
- Requirements for third-party certification (such as LEED®, Green Globes®, or WELL Building Standard®);
- New demands for rapid construction and compressed schedules;
- Greater overhead costs because of extensive and complex "Requests for Proposals" and new marketing expenses;
- Greater expectations for energy conservation and building performance;
- Extensive submissions at various stages of project documentation.

The primary purpose of this document is to guide a fair exchange of value in establishing appropriate fees for architectural services. Because of these significant changes in the design and construction industry, it is impossible to assume that the same professional fee will be appropriate for all projects even if the projects are of the same size and building type. Requirements will vary, and this

document will help all parties in determining the appropriate fee for an architect's services for their unique building project.

The architect, as a member of a self-regulated profession, is ultimately responsible for the quality of architectural services. The architect is required to satisfy their contractual and professional obligations to the client and their regulatory obligation to protect the public interest.

Questions or suggestions regarding an architect's fees are welcomed and should be directed to:

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Ottawa, Ontario, K1N 5M3
Canada

Telephone: 613-241-3600
Email: info@raic.org
Web: www.raic.org

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FROM TOP TO BOTTOM

TWO HULLS HOUSE
MacKay-Lyons Sweetapple Architects
Photo: Greg Richardson

FORT McMURRAY INTERNATIONAL AIRPORT
office of mcfarlane biggar architects + designers inc. (omb) *Project commenced as predecessor firm mcfarlane green biggar Architecture + Design Inc.*
Photo: Ema Peter

AUDAIN ART MUSEUM
Patkau Architects
Photo: James Dow

The Value of the Architect
(Architecture matters)

Architecture is the sole profession whose members are qualified to design and to provide advice, including technical and aesthetic judgment, on the built environment. Architects provide services and solutions with technical competence and aesthetic sensitivity suitable to the physical, social, cultural, and economic environment, thereby inspiring the community and its citizens. In matters of public health and safety, architects are obliged to serve the public interest and respond to the public need. And now, these concepts of health and safety have been expanded to encompass the sustainability of the global environment and accessibility for all persons.

Architects add value to building projects by creating a design and layout that is functional. Architects design for construction that is durable and energy-efficient. Architects work to enhance the look and visual impact of the project to provide a positive experience and increased market value to clients and users.

An architect is invaluable on any building project and furthermore, the use of architectural services by a licensed or registered architect is a requirement for many building types or "occupancies", as required by building codes across Canada.

Design services are usually around 10% of the total of all design and construction costs. Therefore, the architect's fees can be as low as 0.01% of the life cycle costs for design, constructing, and operating a facility. Through good design, the savings can be many fold over the design fees charged in the lifecycle of a building. Building design services are an inappropriate place to cut costs.

Clients and architects need to discuss the value of architectural services and how an architect's ideas and knowledge can result in significant increases to the real estate value of a building, as well as savings in the building's operating and maintenance costs. The pie chart to the right illustrates that the architect's fees are a very small fraction of the total costs for constructing and owning a building. This important upfront investment in professional services can have very significant impacts on future costs of the ownership of any building.

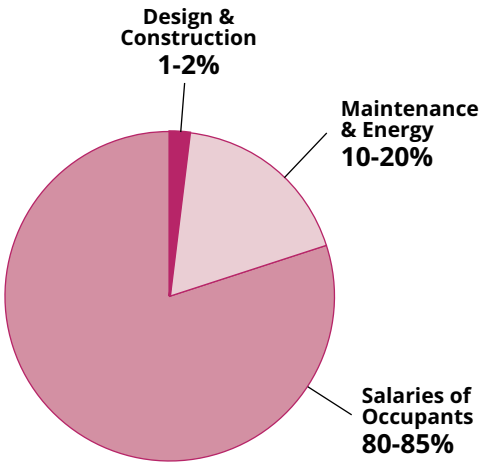


FIGURE 1 *Cost of Design and Construction as a Percentage of Total Asset Life Cycle Costs*

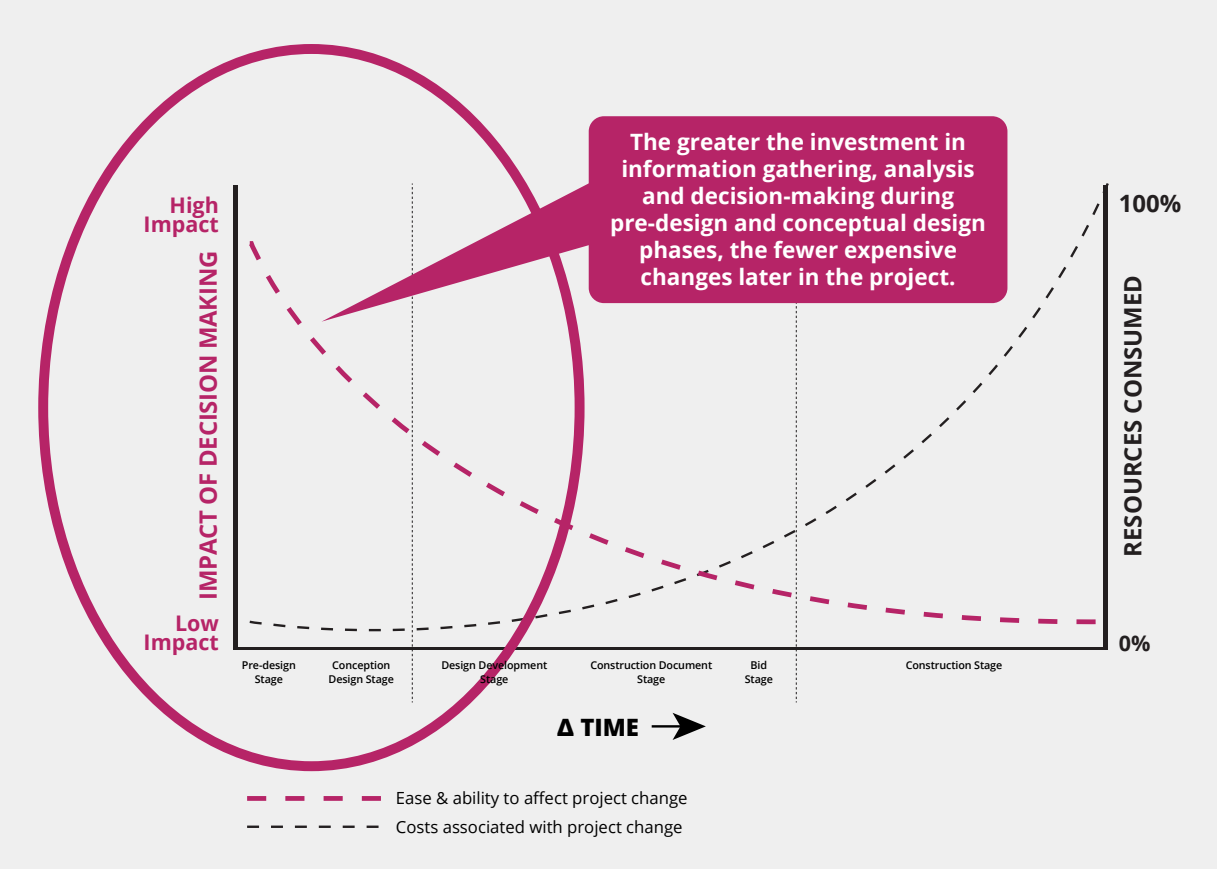


FIGURE 2 *MacLeamy Curve: Influence of Early Effective Decision-making on Project Outcomes*

Strategic thinking that is informed, integrated, and builds on intelligent pre-design and design decision-making will have a positive impact on project quality, cost, and schedule. Clients that invest in integrated early design will realize increased value by significantly reducing the risk of project shortfalls. The MacLeamy Curve[1] in Figure 2 illustrates that early design-based decision-making can lever resources to achieve successful project outcomes and operational efficiency. Reducing project costs by reducing the resources available for an effective design acts to work against the client's and user's best interests.

[1] Although a number of researchers and practitioners have developed graphs that illustrate the impact of decision-making in the project life cycle on project resources, the configuration featured here is credited to architect Patrick MacLeamy.

1 | Architect's Compensation

1.1 | Methods of Compensation

There are several different methods of compensation for an architect's services. The common methods of compensation include:

- Fixed Fee
- Time basis
- Percentage-based Fee

Very often the project and client are best served by a combination of these methods of compensation rather than one single fee. Frequently, it is more appropriate to use one method of compensation for one phase of the project and a different method of compensation for another phase.

For example, in dealing with Authorities Having Jurisdiction and obtaining approvals for a project, which can be indeterminate in complexity and time, it may be fair to compensate the architect on an agreed-to hourly rate. However, the project documentation could then be compensated on a percentage fee based on the construction cost for the project.

In another instance, specific services, such as the preparation of an architectural rendering or marketing materials, could be provided at a fixed price. Additional services for the same project could, in turn, be compensated on a per diem rate or percentage of the construction cost.

1.1.1 | Fixed Fee

A fixed fee is an amount negotiated with the client for professional services that can be sufficiently defined at the outset of the project. This arrangement is only suitable if the scope of the project, the schedule for design and approvals, the construction schedule, and other variables can be determined with reasonable accuracy by the architect.

The fixed fee for such assignments is negotiated after the architect and consultants have prepared a comprehensive estimate of work hours and overhead costs.

The fee then becomes effectively a fixed price, unless project parameters beyond the architect's control change. If these conditions change, or if the size of the project or scope of the architectural services increases or decreases, then the architect's fixed fee must be adjusted.

1.1.2 | Time Basis

Time basis fees are fees that are charged on an agreed-to hourly or daily (per diem) rate. This method of compensation is useful when the services are difficult to determine in advance or are preliminary in nature, and often short in duration.

Time-basis fees are typically used for the following:

- Services that are not well defined;
- Pre-design services;
- Representations and transactions with Authorities Having Jurisdiction;
- Partial services;
- Additional services;
- Conceptual design;
- For a particular phase of the project, such as general/field review;
- For services as an expert witness;
- Renovation projects;
- Preparation of record drawings;
- Specialist expertise or services;
- Program validation;
- Bridging the role of an architect prior to retaining a prime architect.

The actual hourly rates vary across the country and by the level of experience and seniority of the architect and staff. Architects are professionals with extensive training (in some cases the internship and licensing process for architects is considerably longer than that for other professionals, including medical doctors or lawyers) and therefore the hourly rates for architects will correspond to the local market, to the architect's experience and expertise, and to the rates of other licensed professionals in the region.

Hourly billing can utilize fixed dollar rates (such as $250 per hour) or they can use a fee multiplier. There are two types of multipliers – one that is a multiplier of "Direct Salary Expenses" and another that is a multiplier of "Direct Personnel Expenses". Direct personnel expenses are the most common. When the rates for architects and their staff are based on "Direct Personnel Expenses" they include those items listed in the definitions section of this document.

Additional factors should be considered for overtime expenses if such work is undertaken at the client's request or to meet scheduling demands beyond the architect's control.

The hourly or per diem (daily) rates for architects and their staff should be agreed at the outset. Additionally, the client and architect should agree upon a time period (e.g. annually) for review and adjustment of the hourly rates in order to adjust for inflation and other factors.

1.1.3 | Percentage-based Fee

A percentage-based fee is a method of compensation which links the fee for the architect's services to a percentage of the construction cost of the project. The percentage will vary depending on the type of building, the construction value, the type of construction contract, and fee adjustments described in Section 1.2.

It is possible using a percentage-based fee to calculate architectural fees on a net basis, that is excluding all engineering and specialist consultant fees. It is also possible to calculate a percentage-based fee including the basic engineering services for structural, mechanical, and electrical engineering. This document includes charts which illustrate both methods.

Percentage-based fees are based on sliding scales considering both the size and complexity of the project and the construction cost. The sliding scales are not suitable for many renovation projects nor for very complex or custom projects. The fee indicated on the sliding scale is the starting point for discussion. It is a baseline fee that must then be revised using the various fee adjustment factors to determine the appropriate fee for architectural services for the unique project.

When calculating the distribution of the fee over the traditional five phases of simple and average projects, the following breakdown is typical:

Phase	Percentage of Total Fee
Schematic Design	12.5%
Design Development	12.5%
Construction Documents	50%
Bidding and Negotiation	2.5%
Construction (Contract Administration)	22.5%

TABLE 1 *Typical Breakdown of Fees Over Design Project Phases*

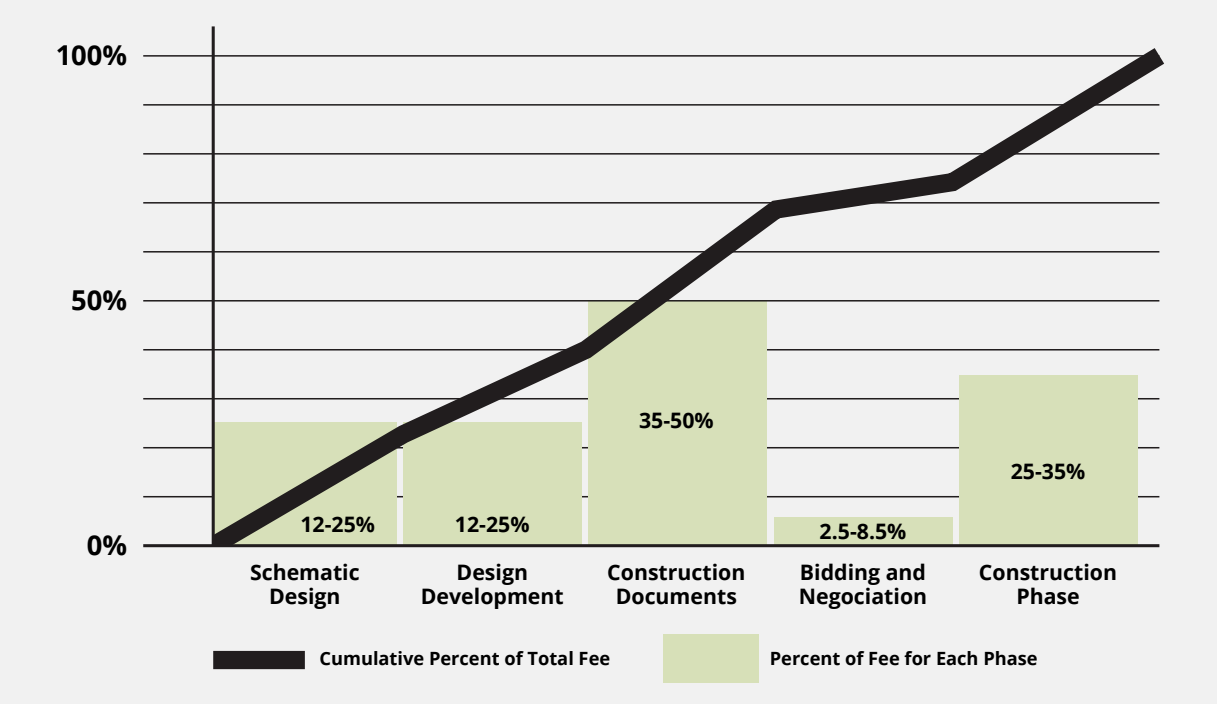


FIGURE 3 *Typical Allocation of Fees for a "Traditional" Architectural Project*

Complex projects, such as extensive renovations or heritage conservation, may require addition resources during the construction documentation and construction (contract administration) phases, thus changing the balance of fees across the phases.

1.1.3.1 | Percentage-based Fee for Projects Using Building Information Modeling (BIM)

Emerging forms of project design and documentation, such as Building Information Modeling (BIM), require more documentation and design in the early phases. The table below reflects a range of fee breakdowns for projects with intense early phases. For specific projects, it may be appropriate to vary theses percentages, subject to agreement with the client.

Phase	Percentage of Total Fee
Schematic Design	20-25%
Design Development	20-25%
Construction Documents	35-25%
Bidding and Negotiation	2.5%
Construction (Contract Administration)	22.5%

TABLE 2 *Range of Fee Breakdowns for Projects with Intensive Early Phases Including Building Information Modeling*

1.1.3.2 | Construction Costs

It is important for the client to have a full understanding of the definition of construction costs. This is the basis for calculating the fee using a percentage that has been negotiated.

The definition states:

> ***"The Construction Cost is the total cost of the Work to the Client to construct all elements of the project designed or specified by, or on behalf of, as a result of coordination by, the Architect, consisting of the Construction Contract price, cost of changes to the Work during construction, construction management fees or other fees for the coordination or procurement of construction services, and all applicable taxes, except Value-Added Taxes, which shall be excluded. Construction Cost excludes the compensation of the Architect and Consultants, land cost, land development charges and other professional fees."***
>
> **Canadian Standard Form of Contract for Architectural Services – Document Six,**
> Royal Architectural Institute of Canada, Ottawa, 2018.
>
> *(Referred to as 'RAIC Document Six' throughout the document)*

At the project outset, the construction cost is a mutually understood and agreed to budget. As the project develops, estimates of the construction cost are prepared and further refined until the actual contract price or construction cost is known. The figure is usually adjusted again during the construction phase based upon mutually agreed upon amounts at the beginning of each phase.

The basis for calculating the percentage fee should typically be as follows:

- Before a construction cost estimate is available, the fee is based on the construction budget at the time of the invoice;
- After a construction cost estimate is available, the fee is based on the current construction cost estimate at the time of the invoice;
- After the construction contract is entered into, the fee is based on the current construction cost at the time of the invoice.

Phase	Amount
Schematic Design	Construction budget
Design Development	Construction cost estimate
Construction Documents	Updated construction cost estimate
Bidding and Negotiation	Updated construction cost estimate
Construction (Contract Administration)	Actual construction cost

TABLE 3 *Construction Cost Estimation by Project Phase*

Refer to "Appendix C – Typical Invoice Using Percentage-based Fee" for sample calculations when determining the eventual fee.

1.1.3.3 | Percentage Fees and Basic Architectural Services

Basic architectural services are listed in Table 3 and described in detail in "Appendix E – Basic Services of an Architect". The recommended percentage-based fees listed in Tables 4 and 5 are based on basic architectural services.

Basic architectural services usually mean a five-phased approach for the design and construction of a building (refer to Table 3). This service will usually result in the production of the "instruments of service"[2] needed to obtain the required permits for construction, and will provide general/field review services to confirm that the building as constructed is consistent with the design.

The phases described in the following chart list the basic services for each phase. Note that "Pre-design" and "Post-construction" services are additional services and are therefore not included in the chart. Neither are "Pre-design" or "Post-construction" services included in the percentage fee listed in the chart.

Basic Architectural Services									
Project Assessment	Concept Approval		Approvals from Authorities		Awards of Construction Contract				
1 Schematic Design	**2** Design Development		**3** Construction Documents		**4** Bidding or Negotiation		**5** Construction Phase – Contract Administration		
ARCHITECT'S SERVICES • Client-supplied Data Coordination • Program and Budget Evaluation • Review of Alternative Design Approaches • Architectural Schematic Design • Schematic Design Drawings and Documents • Statement of Probable Construction Costs	ARCHITECT'S SERVICES • Client-supplied Data Coordination • Design Coordination • Architectural Design Development • Design Development Drawings and Documents • Statement of Probable Construction Costs • Client Consultation • Agency Consultation		ARCHITECT'S SERVICES • Client-supplied Data Coordination • Project Coordination • Architectural Construction Documents (Working Drawings, Form of Construction Contract and Specifications) • Document Checking and Coordination • Statement of Probable Construction Costs • Client Consultation • Interior Construction Documents • Consult authorities		ARCHITECT'S SERVICES • Client-supplied Data Coordination • Project Coordination • Issue Bidding Documents • Issue Addenda • Bid Evaluation • Construction Contract • Client Consultation • Separate Bids or Negotiated Bids • Services Related to Bidders' Proposals • Consult Authorities		ARCHITECT'S SERVICES • Contract Administration and General/Field Review • Progress Reports/ Evaluation • Process Certificates for Payment • Interpretation of Contract Documents • Review of Shop Drawing • Product Data/Sample • Change Orders • Substantial Performance Report and Certification • Client Consultation • Interior Construction Review • Record Drawings	

TABLE 4 *Basic Architectural Services*

[2] Instruments of Service are representations, in any medium of expression, of the tangible and intangible creative work that forms part of the services or additional services. The architect and the consultants engaged by the architect shall retain all common law, statutory, and other reserved rights, including copyrights, to the Instruments of Service. The Instruments of Service shall be used only by the client for the intended purposes of the project at the place of the work and shall not be offered for sale or transfer to third parties without the architect's written consent.

1.1.4 | Range of Percentage Fees for Services

1.1.4.1 | Range of Percentage Fees for Architectural Services Only Without Engineering Fees for "Average" Projects

The percentage-based fees listed in Tables 5 and 6 below are based on basic architectural services listed in Table 4 and described in detail in "Appendix E – Basic Services of an Architect". The percentage fees are for projects of an average level of complexity (See notes in 1.1.4.3 below).

Base Percentage Fee by Building Category (in millions) – *New Construction* WITHOUT Basic Engineering Fees								
CONSTRUCTION COST / BUILDING CATEGORY	<$500,000	$500,000 to <$1M	$1M to <$2M	$2M to <$5M	$5M to <$10M	$10M to <$25M	$25M to <$50M	<$50 million
1	7.14	6.12	5.07	4.78	4.57	4.46	4.18	Fees for projects with a construction value above $50m to be negotiated
2	8.24	7.26	6.70	5.93	5.70	5.41	5.15	
3	8.72	7.93	6.96	6.28	5.99	5.78	5.49	
4	9.45	8.40	7.49	6.93	6.70	6.83	6.09	
5	10.24	9.19	8.14	7.67	7.40	7.04	6.72	
6	10.76	9.45	8.40	7.75	7.28	6.96	6.65	
7	14.18	14.96	13.91	13.26	12.74	12.21	11.69	

TABLE 5 *Average Fees for Basic Architectural Services Only*

1.1.4.2 | Range of Percentage Fees with Architectural and Basic Engineering Fees for "Average"' Projects

Base Percentage Fee by Building Category (in millions) – *New Construction* WITH Basic Engineering (structural, mechanical, and electrical ONLY)								
CONSTRUCTION COST / BUILDING CATEGORY	<$500,000	$500,000 to <$1M	$1M to <$2M	$2M to <$5M	$5M to <$10M	$10M to <$25M	$25M to <$50M	<$50 million
1	9.22	8.17	7.85	7.76	7.55	7.34	7.13	Fees for projects with a construction value above $50m to be negotiated
2	10.26	9.39	8.91	8.80	8.60	8.38	8.17	
3	11.32	10.26	9.96	9.85	9.64	9.43	9.22	
4	12.36	11.32	11.00	10.89	10.68	10.47	10.26	
5	13.41	12.36	12.05	11.95	11.74	11.53	11.32	
6	14.45	13.41	13.09	13.00	12.78	12.57	12.36	
7	18.48	17.60	17.28	17.00	16.14	15.46	14.95	

TABLE 6 *Average Fees for Basic Architectural and Engineering Services*

1.1.4.3 | Notes for Fees Tables in 1.1.4.1 and 1.1.4.2

For simple projects, apply a factor of 85% to the average fee.

For complex projects, apply a factor of 115% to the average fee.

"Simple" means utilitarian in character without complication of design, a minimum of finishes, and coordination of basic structural, mechanical, and electrical systems.

"Average" means conventional in character requiring coordination of the structural, mechanical, and electrical systems.

"Complex" means exceptional character and complexity of design requiring more advanced systems and coordination of complex structural, mechanical, and electrical systems. Complex projects require increased integration of the work of multiple other disciplines, such as information and communications infrastructure, security, high-performance regenerative, and power generating/ conservation systems.

Fees must be adjusted based on fee adjustment factors listed in Section 1.2

Additional services may be required for simple, average, or complex projects where the architect is responsible for developing and managing extensive submissions to Authorities Having Jurisdiction beyond the initial submission. These may include repeated submissions and appearances before committees of adjustment, site plan review panels, or multiple levels of government. The management of stakeholder engagement, heritage preservation, and extra-jurisdictional approvals and/or certifications may also require work in addition to basic architectural services.

1.1.5 | Other

Occasionally, in some provinces, architects are paid on a unit basis for projects such as multiple-unit housing or hotels that have a repetitive element. Unit fee determinations are frequently arbitrary and do not relate to the nature and scope of architectural services.

1.1.6 | Inflation Factor

The calculation of percentage-based fees, and the method of adjusting fees described in Table 3, accommodates potential changes in the value of money over the life of the projects. Some project may extend over a protracted period and specific mention of fee adjustment factors based on inflation may be required.

FROM TOP TO BOTTOM

COMPLEXE SPORTIF SAINT-LAURENT
SAUCIER+PERROTTE /
HCMA Architecture + Design
Photo: Olivier Blouin

FORT YORK VISITOR CENTRE
Patkau Architects Inc. /
Kearns Mancini Architects Inc.
Photo: Tom Arban Photography

1.2 | Fee Adjustment Factors / Variables Affecting the Architect's Fee

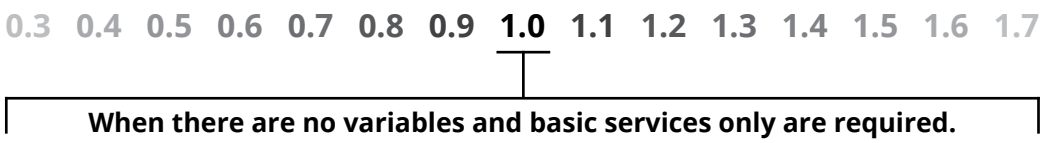
As indicated in the Preface, the design and construction industry has become increasingly complex and each project may be subject to unique factors that must be considered when determining an appropriate fee.

Fee adjustment factors are listed below. This list is not exhaustive and certain clients or architects may have other factors that affect the cost of professional services for the building project. Fees may be adjusted for:

- Fixed Fee
- Time basis
- Percentage-based Fee
- Enhanced Scope of Services
    - Pre-design Services
    - Additional Services
- Project Delivery Method and Construction Procurement
    - Sequential Tendering
    - Design-Bid-Build
    - Design-Build
    - Construction Management
    - Public Private Partnerships (P3)
    - Other
    - Integrated Project Delivery
    - Lean Construction
- Fast-track Projects
- Project Documentation and Computer Modeling
- Specialist Consultants
- Enhanced or Extensive Submissions to Authorities Having Jurisdiction Beyond Initial Submissions (refer to Section 1.2.6 – Fee Adjustment Factor 6)
- New Technologies
- Enhanced or Extensive Construction Contract Administration
- Project Location and Site Conditions
- Renovations to Existing Buildings (versus new construction)
- Repeat Work or Repetitive Designs
- Architect's Personnel
- Demobilization and Remobilization (stop and start-up of workforce)
- Phased Building Occupancies
- Full-time On-site General/Field Review

Often the variable is a percentage or multiplier used to adjust the fee. Sometimes the variable may result in a reduced fee, such as for repetitive design work, or the elimination of an entire phase (such as bidding and contract negotiation if undertaken by the client).

This guide proposes the following variables as multipliers:



Once the client and architect have determined the building type, the project and construction budgets, the method of project delivery, the role of consultants, and the scope of services, together with other fee adjustment factors noted above, it is then possible to negotiate a fee for architectural services that reflects a fair exchange of value. All factors must be compounded and then multiplied against the percentage-based fee to determine the appropriate final fee for each unique project.

Refer to the matrix or worksheet in "Appendix A – Fee Calculation Sheet" and "Appendix B – Example Fees Using Fee Calculation Worksheet" to assist in the application of Fee Adjustment Factors and in determining the appropriate fee.

1.2.1 | Fee Adjustment Factor 1 – Enhanced Scope of Services

It is necessary for the client and architect to have a mutual understanding of the nature and scope of services required and expected. The schedule of architect's services used in RAIC Document Six is a comprehensive checklist to achieve a mutual understanding and agreement. "Appendix E – Basics Services of an Architect" provides a condensed but comprehensive chart of basic architectural services.[3] If the architect is providing "Partial" or "Additional" services, then the basic fee will need to be reduced or increased accordingly.

1.2.1.1 | Pre-design Services

Very often a client will not have completed preliminary studies or obtained the necessary data to commence architectural design work. The architect may provide pre-design services for an additional fee (such as the preparation of a functional program or design brief) or arrange for the necessary consultants to prepare the work (such as a traffic study or toxic and hazardous materials report).

Pre-design services may include:

- Functional Programming
- Space Relationships/ Flow Diagrams
- Project Development Scheduling
- Project Budgeting
- Life Cycle Cost Studies
- Economic Feasibility Studies
- Agency Consulting/ Review/Approval
- Site Selection
- Site Analysis Utilization
- Legal Survey
- Geotechnical Analysis
- Project Financing
- Environmental Studies
- Energy Studies
- Existing Facilities Surveys
- Client-supplied Data Coordination
- Services Related to Project Management
- Presentations
- Marketing Studies
- Special Studies
- Re-Zoning Assistance
- Project Promotion
- Special Consulting Services

[3] Several provincial associations of architects have their own contracts for use within their province.

1.2.1.2 | Additional Services

In addition to the basic architectural services noted above, many architects provide a wide range of other or "additional" services. Some architects specialize in some of these additional services. For a list of these additional services, refer to "Appendix G – List of Additional Architectural Services".

1.2.2 | Fee Adjustment Factor 2 – Project Delivery Method and Construction Procurement

The type of project delivery, or procurement of construction services, can have a big impact on the architect's services and fees. Small projects with experienced and reliable contractors may require basic field review and contract administration services. However more complex projects, builders with limited experience, and newer methods of project delivery beyond the traditional design-bid-build will require more time, more services, and consequently additional fees. Furthermore, the type of construction contract can affect the architect's fee. For example, cost plus contracts or unit price contracts (as opposed to stipulated sum contracts) require additional contract administration services for the preparation of Certificates for Payment. Therefore, the fee must be increased.

Each of the three traditional methods of project delivery described below, design-bid-build, design-build, and construction management, have benefits and drawbacks. It is critical that the client and architect have a shared understanding of which method is most appropriate for the client's needs and project success.

1.2.2.1 | Design-Bid-Build

Design-bid-build is the traditional form of project delivery and the percentage-based fee Tables 5 and 6 reflect this form of construction procurement. A precondition necessary to achieve a successful design-bid-build outcome is that the design services contract must create the conditions necessary for services to yield design documentation of the highest quality, and appropriate to the nature of the project (completeness + precision + accuracy). These conditions prominently include fair exchange of value for the effort required to produce such documentation. This is the reason that the scale of fees associated with this method is considered baseline.

In this instance, the architectural design and construction documents must be complete, and one single bid package is prepared. Following bidding and preparation of one contract with one builder or general contractor, the construction contract is administered by the architect.

1.2.2.2 | Design-Build

If the client selects a design-build team to be responsible for both the design and the construction of the project, a design-build procurement option would be appropriate. The fees for services provided by the architect to the design-builder can be established in accordance with the Schedules in RAIC Document Six. A fee adjustment factor need only be applied if the conditions of the contract introduce risks such as shared financial risk among design-build team members.

More information on the design-build process can be obtained from the Canadian Design-Build Institute at www.cdbi.org

1.2.2.3 | Construction Management

Construction Management is a project delivery method where a construction manager acts in a consultative role to the client, providing information on issues such as market conditions, cost, schedule, and constructability. Information provided by the construction manager becomes an input into the design process. A construction manager may also be "at risk" for the ultimate construction cost of the project. A construction manager is often involved in sequential tendering to fast-track the project schedule and deliver the outcome earlier than other delivery methods.

The scope of the architect's services is affected by the defined role of the construction manager. As a result of sequential tendering, the architect may be responsible for additional services such as cost planning/estimating, site condition studies and other pre-design issues, development of trade contract general conditions and requirements, bidding process management and development of bid documents, multiple construction contract administration tasks including multiple payment certifications, construction quality control processes, and multiple closeout procedures. Fee adjustment factors would be needed to address the project management processes needed for construction management project delivery. This includes fast-tracking, sequential project design development, multiple prime contractors, and tender packages issuance and administration.

1.2.2.4 | The Three Traditional Methods of Design/Construction Project Delivery Compared

To determine whether a fee adjustment factor is appropriate based on the method of project delivery, a critical and shared understanding of the method is required of both the client and the architect. Each form of project delivery has its own benefits and drawbacks. At the risk of over-simplification, these benefits and drawbacks are compared using a project triple-constraint model where the scope of the project is assumed to be fixed. The constraints are time (schedule), cost, and performance/quality.

PROJECT DELIVERY METHOD	Constrained Factor		
	Schedule	**Cost**	**Performance/Quality**
Design-Bid-Build	• The schedule must accommodate the time needed to prepare complete and accurate design and construction documents. It must also provide sufficient time for the client and other project stakeholders, including funders, Authorities Having Jurisdiction, and users, to review, comment, and approve the design.	• A firm construction cost is not known until after tender and negotiation are completed but before construction begins.	• Performance and quality of the outcome are known before tender. This is a precondition to the design-bid-build method to avoid scope creep and construction-phase changes.
Bid-Design-Build	• The design-builder or construction manager may accelerate the schedule though sequential tendering and fast-tracking. Through the fast-tracking method, design and construction tasks are concurrent and the schedule is compressed. Sequential tendering may accelerate the schedule by providing select trades access to tender documents in advance of completed design.	• A firm construction cost is established based on project requirements before design.	• The design-builder has the authority to make trade-offs to performance/quality provided the owner's project requirements are satisfied.
Construction Management		• The ultimate construction cost of the project is not known until most or all of the separate packages have been tendered and inevitable changes resulting from fast-tracking have been quoted and approved.	• The performance/quality of the project's outcomes is established at the outset but adjusted as necessary on a progressive basis as the project's construction cost becomes known.

TABLE 7 *Fee Adjustment Factors Related to Project Delivery Method*

1.2.2.5 | Fee Adjustment Factors Related to Project Delivery Method and Project

Change and uncertainty are inherent in undertaking projects. Project endeavours and risk are inseparable, and no amount of planning can remove ALL project risks. Again, at the possibility of over-simplification, each design/construction project delivery method has a general risk profile. To establish a fair exchange of value, the client and architect must recognize alignment of the project delivery risk profile with their respective risk sensitivities.

PROJECT DELIVERY METHOD	Constrained Factor		
	Schedule	**Cost**	**Performance/Quality**
Design-Bid-Build	• Schedule certainty can only be achieved at the expense of cost and performance. The completion of design documents, and therefore the project schedule, may be delayed if project requirements are incomplete, complex or stakeholder interests are conflicting. • Through comprehensive pre-design and conceptual design information gathering, analysis, and strategic design decision-making, the risk is mitigated but the schedule is lengthened, and consulting fees may increase. • Building schedule elasticity into the project plan may mitigate risk.	• The firm construction cost is not known until the design is complete, tenders are analyzed, and negotiations completed. • The risk is mitigated but consulting fees are increased through progressive cost estimations throughout the design and documentation phases. • Cost risk is mitigated by including project contingencies	• Performance and quality are firmly established throughout the design process.
Design-Build	• The schedule for project delivery, along with cost, should be identified and stated in the contract. Elasticity in the schedule may be required to accommodate unexpected market conditions. • The schedule may or may not be accelerated depending on the extent of the client's need to approve the design and specifications.	• A commitment to the construction cost is established early in the project. • Cost certainty is predicated on the client, providing the design-builder with a comprehensive and well-developed statement of project requirements at the outset. • Changes to the requirements leading to design-phase or construction-phase changes may result in disproportionate cost increases.	• The performance/quality of the outcome may not be completely known until the project is in construction. • The design team is under the authority of the design-builder, not the client. • The risks are mitigated through the client's development of a comprehensive requirements document and the engagement of an advocate architect/engineering team who monitor design and construction on behalf of the client. Both risk mitigation strategies increase consulting fees and possibly lengthen the project schedule.
Construction Management	• The schedule may be accelerated through fast-tracking and/or sequential tendering. • Fast-tracking requires a significant amount of additional effort in managing the design and coordinating the design and construction work. Fast-tracking results in an increased risk of design and construction rework, along with the resulting additional fees and construction costs.	• The client must commit to design and construction without a firm construction cost. • The risk is mitigated through progressive cost estimation and input from contractors, trades, and product manufacturers. This may require additional consulting services and fees.	• Cost cutting measures resulting in reduced performance/quality may be required at later stages in the design and construction to bring the project in to budget. • The risk is mitigated by developing a trade-off plan early in the project to support strategic decision making. This requires additional services and fees.

TABLE 8 *Risk Profiles Related to Project Delivery Methods*

A Common Risk to All Project Delivery Methods

There are several risks that may impact the schedule, cost, and/or quality of the project with all procurement methods. A notable risk is market conditions in the construction industry. Products planned to be used during the design phase may become unavailable or excessively expensive at the time of construction, and substitutions must be identified, proposed, reviewed, quoted, and approved. The tendering/negotiation phase may be extended to allow the architect to develop design alternatives and for the successful bidder(s) to gather revised price quotes, should the quoted cost exceed the project budget.

1.2.2.6 Public-Private Partnership

(Also referred to as P3 or Alternative Financing and Procurement (AFP) in Ontario)

In these various forms of project delivery, the client usually contracts with one entity. This entity may assume responsibility and usually integrates all aspects of the project including: financing, design and construction, and operation and maintenance. This arrangement is increasingly common for larger projects, including infrastructure projects where various levels of government transfer the financing to the private sector. Typically, this single entity (not necessarily the owner of the building) engages the architect. The architect may or may not have the opportunity to develop a professional relationship with the ultimate users of the project.

As in design-build procurement methods, the fees for services provided by the architect to the lead proponent can be established in accordance with the Schedules in RAIC Document Six. A fee adjustment factor may be applied if the conditions of the contract introduce risks such as shared financial risk or being required to contribute to project pursuit costs.

1.2.2.7 Other Project Delivery Methods or Design Processes

Other project delivery methods are emerging that focus on increasing efficiency and effectiveness though changing the relationships of design and construction professionals and by integrating design and construction processes more closely. Lean construction and Integrated Project Delivery (IPD) are two of these new methods. Both are supported by the technological innovations introduced by Building Information Modeling (BIM). The basis for establishing a fair exchange for value using new project delivery methods may involve partnering and a sharing of project risk. New models of determining appropriate fees will need to be established.

A client may require the architect to engage in alternate approaches to design, such as the Integrated Design Process (IDP) to satisfy the requirements of a building certification process, such as LEED. Although the schedule includes certification as a service, an adjustment factor may be required to address the additional effort needed in managing the consulting design team in alternate design processes.

1.2.3 | Fee Adjustment Factor 3 – Schedule and Fast Track Projects

Building on the project delivery method discussion above, in today's fast-paced business world there is often a pressure to complete a project as soon as possible to occupy the building. This schedule may be necessary to accommodate tenants, to start-up a manufacturing process, or to begin a new school session. Fast-tracking is the schedule management process where work normally done in sequence is done concurrently. For example, construction work commences while design work is still underway. Rework of both design and construction are inherent risks in fast-track projects, as the normal inputs to each aspect of design may not be established and the architect and construction forces are forced to work with an increased number of unknowns. Fast-track projects require additional fees as the architect may need to redo design work already completed, hire additional staff, pay staff for overtime work, and re-schedule other work to accommodate the priorities of such a project.

Another factor is extended construction schedules. Even with a traditional form of project delivery such as design-bid-build, if the contractor's construction schedule is extended, then the architect's services also must be extended, and compensation is required for the increased resources required to administer the construction contract. On the other hand, if the schedule is fast and protracted, decision times are reduced and fees may be adjusted accordingly.

1.2.4 | Fee Adjustment Factor 4 – Project Documentation and Computer Modeling

Many clients require unique forms of documentation (such as their own specialized computer standards or "printer-friendly" formats) or there may be a requirement to adjust the computer language or platform to accommodate the consultant's, contractor's, or client's needs.

Increasingly there is a demand to develop all designs and the project documentation using a Building Information Model (BIM). Furthermore, there is often a need to provide electronic documents in a variety of formats to several different parties in the development of the project, whether for review and approvals, the preparation of shop drawings, or for bidding purposes. This can be very time consuming to provide such a wide range of documentation to many different parties. All of this can be expensive and must result in an adjustment to the architect's and consultants' fees.

Additional services may be required by a client to provide project stakeholders with complete 3D visualization, computer-aided facility management (CAFM), or computer-aided energy modeling. Analysis of the virtual design and energy modeling may become a valuable input to detailed design developmental and be an effective risk mitigation strategy to identify incomplete, unstated or misunderstood project requirements, or enhanced building performance.

1.2.5 | Fee Adjustment Factor 5 – Specialist Consultants

As noted previously there is need for more and more specialist consultants as technology and regulations expand. The architect typically coordinates the specialist and subconsultants, whether or not they have been retained directly by the architect or by the client. The fee for the services and coordination of specialist consultants is always over and above the fee or normal percentage for the architect's services.

1.2.6 | Fee Adjustment Factor 6 – Approvals and Authorities Having Jurisdiction

The number of approvals from various Authorities Having Jurisdiction continues to grow. At one time, certain projects may have only required a building permit. Today, however, most projects must be reviewed by several different authorities. Approvals such as site plan approvals or site development approvals, and phased building permits, are significantly more time-consuming. Providing the necessary documentation, communicating with the relevant authorities, and accommodating their design and technical requirements, is exceedingly onerous. Requirements vary by jurisdiction and by building type; therefore, the fee must be adjusted for each jurisdiction and for each building type.

1.2.7 | Fee Adjustment Factor 7 – Submittals (not related to construction)

Certain clients, notably the federal and provincial governments, their agencies, and crown corporations, require several submissions of the design and construction documents at various stages of completion. The more frequent the submittals the more costly the effort to prepare the documentation for the submission. The fee must be adjusted to reflect the number of submittals required.

1.2.8 | Fee Adjustment Factor 8 – New Technologies

There are new technologies appearing daily including the need for better energy performance, new building products and building systems, advanced construction methods, and design tools. Many clients are anxious to incorporate these latest innovations into their projects. Sometimes this request can be costly as there are often unknown risks in using products or systems that do not have a track record, or there may be additional certifications, testing, submittals and/or approvals required. There may also be additional specialist consultants that need to be retained and coordinated. Frequently, there is also additional research or other services required on the part of the architect.

1.2.9 | Fee Adjustment Factor 9 – Construction Administration

Today many clients are demanding a level of service by the architect and other consultants that exceeds that which is required to exercise a reasonable standard of care during the field review and contract administration phase of the project.

Such services may include, but are not limited to:

- Additional meetings, coordination, and/or site visits with the client's representatives, user groups, contractors, and sub-trades which normally do not require the consultant's presence at the time;
- Requirements for the architect to chair and/or minute meetings called by others;
- Requirements for a minimum number of meetings and site visits regardless of whether it is warranted by the construction process;
- Additional clarifications and site visits resulting from the client's selection of specific contractors, sub-trades, suppliers and/or products; and
- Excessive site visits due to the non-performance of construction forces.

The architect and client should discuss this higher level of service for field reviews and construction administration at the outset of the project to determine what is required, and the necessary fee adjustments.

1.2.10 | Fee Adjustment Factor 10 – Project Location and Site Conditions

The project location and site conditions may affect the architect's services. A very tight, dense, urban site or a remote site in the north can both have complications in terms of design. Furthermore, a remote site may require travel time and reimbursable expenses considerably beyond the normal. Those factors related to the site conditions and location should be considered when agreeing to the architect's fee.

1.2.11 | Fee Adjustment Factor 11 – Renovation to Existing Buildings (versus new construction)

Renovation work is well-known for its unknown conditions. For this reason, it is recommended that renovations to existing buildings be performed on a time basis. If a percentage-fee is used, the fee needs to be adjusted and increased to allow for the unknown work and the subsequent design modifications the architects will need to make.

Heritage conservation projects can result in a significantly increased scope of architectural services, as well as coordination with special consultants. A fee adjustment factor to address additional coordination, as well as additional defined services, is recommended.

1.2.12 | Fee Adjustment Factor 12 – Repeat Work or Repetitive Designs

When two or more buildings are constructed for the same client from the same unmodified design, the fee for the architect's services is usually reduced by about 50% (an adjustment factor of 0.5) for all phases of the work except for construction administration, which remains the same. As each building is constructed separately, construction administration services, including field review, are the same for each. Modifications and adaptations of the design for re-use are often charged on a time-basis.

Any sale of the right to use the design, instruments of service, or royalties must be negotiated with the architect.[4]

[4] Instruments of service are representations, in any medium of expression, of the tangible and intangible creative work that forms part of the services or additional services. The architect and the consultants engaged by the architect shall retain all common law, statutory, and other reserved rights, including copyrights, to the instruments of service. The instruments of service shall be used only by the client for the intended purposes of the project at the place of the work and shall not be offered for sale or transfer to third parties without the architect's written consent.

1.2.13 | Fee Adjustment Factor 13 – Architect's Personnel

There are several factors which may affect the architect's fee as a result of the architect's own staff. Overtime work will require additional fees. Some projects benefit from the involvement of more senior and experienced staff. Locations other than the architect's own premises, or other unique overhead costs as a result of the project, will also need to be accounted for.

1.2.14 | Fee Adjustment Factor 14 – Demobilization and Remobilization (stop and start-up of architect's workforce)

On some projects it is necessary to stop work on the design or preparation of construction documents. Sometimes this is due to a delay in funding approvals or for other circumstances. Such a situation is often problematic for the architect who has consultants and staff who have been committed to the project and must be reassigned or even released. Similarly, if a project is suddenly "back on the boards" or restarted, the architect must make the necessary arrangements for staffing and to recommence production work on the project. Such a situation can be costly and can affect the architect's cash flow and bottom line; therefore it is important to negotiate a fee adjustment when this occurs.

1.2.15 | Fee Adjustment Factor 15 – Phased Building Occupancies

On certain very large and complex projects, building users and clients often want to occupy various parts of a building as soon as they are completed. For example, two or three floors on a high-rise hospital may require take-over and commissioning of this section of the building prior to completion of the entire project. This additional requirement adds to the architect's services. Multiple occupancies over a period of time for the same project must be considered, and the appropriate adjustment to the fee then determined when this occurs.

1.2.16 | Fee Adjustment Factor 16 – Full-time On-site Field Review

It is now common, especially on larger projects and for projects using construction management services, for clients to request that the architect provide personnel to be present on the construction site on a full-time basis. This member of the architect's staff assists the contractor in processing Requests for Information (RFI's), other administrative matters, undertakes general reviews, and coordinates and resolves problems to ensure the project progresses efficiently. This additional staff member, dedicated to this particular project, must be compensated and the fee adjusted accordingly.

1.3 | Reimbursable Expenses

Normally the architect incurs direct expenses on behalf of the client. These expenses relate to the provision of the architect's services and the production of the instruments of service. They include computer models, drawings, and specifications that are the result of designing, documenting, bidding, and constructing a building. These expenses are incurred in the interests of the project and are not covered by professional fees. "Reimbursable Expenses" is also a defined term in RAIC Document Six.

Reimbursable expenses can include:

- Transportation for travel authorized by the client, in connection to the project (transportation, lodging, and meals);
- Communication and shipping costs (long distance charges, courier, postage, dedicated web hosting, etc.);
- Reproduction costs for plans, sketches, drawings, graphic representations, and other documents);
- Renderings, models, prints of computer-generated drawings, and mock-ups specifically requested by the client;
- Special computer modeling and documentation;
- Certification and documentation costs for third party certifications such as LEED®;
- Fees, levies, duties or taxes for permits, licenses, or approvals from Authorities Having Jurisdiction;
- Additional insurance coverage or limits, including additional professional liability insurance requested by the client in excess of that normally carried by the architect and the architect's consultants;
- Direct expenses (as listed above) incurred by the architect's employees, engineering consultants, and other consultants.

1.3.1 | Administrative Charges

The management of reimbursable expenses is a service provided to the client by the architect. Reimbursable expenses are normally billed at cost plus an administrative charge (often 10-15%) to cover in-house administration, handling, and financing.

1.3.2 | Professional Liability Insurance

Architectural licensing authorities in Canada require that those architectural practices authorized to provide services to the public carry a minimum level of professional liability insurance.

Standard forms of contract, such as RAIC Document Six, require the architect to carry such insurance and allows for the client to obtain a copy of the Certificate of Professional Liability Insurance.

1.4 | Payment

The Agreement Form in RAIC Document Six also requires other payment provisions to be completed.

1.4.1 | Retainer

A retainer is an advance payment on fees that would be deducted from the final invoice and is accounted for as a statement of credit on the client's account. An amount should be agreed to by the client and architect and inserted in Article A15 of RAIC Document Six. Regulations governing retainer fees may vary from province to province. Architects are required to familiarize themselves with these regulations prior to completing the contract for architectural services.

1.4.2 | Billing Period

Article A16 of RAIC Document Six indicates that invoices shall be issued monthly. If the frequency of billing should be at different intervals, this clause should be changed to bi-weekly or other time periods such as project milestones.

1.4.3 | Interest

The amount of interest on unpaid invoices should be specified as required in RAIC Document Six.

BORDEN PARK PAVILION
gh3
Photo: Raymond Chow (gh3)

PARALLELOGRAM HOUSE
5468796 Architecture Inc.
Photo: 5468796 Architecture

RABBIT SNARE GORGE
Omar Gandhi Architect Inc. in collaboration with Design Base 8 (NYC)
Photo: Doublespace Photography

1.5 | Other Payment Provisions

1.5.1 | Statutory Holdbacks

In some jurisdictions architects have lien rights and their fees are subject to statutory holdbacks depending on the lien legislation in the province or territory. For very large projects this can represent a significant financial burden for an architectural firm, especially for a project whose design and construction can extend over several years.

If the *client* retains holdback from payments to the *architect* pursuant to applicable lien legislation, and the *architect* provides *services* both before and after the commencement of the *work*, then for purposes of the applicable lien legislation, this contract shall be deemed to be divided into two contracts comprised of:

1. A contract for the provision of *services* up to and including the commencement of the *work*;
2. A second contract for the provision of *services* after the commencement of the *work*.

1.5.2 | Redesign Changes

Occasionally, it is necessary to redesign a building. Redesign may be due to changes in functional requirements, reduced funding available, a personnel change in the client's administration, or for a variety of other reasons beyond the control of the architect. Redesign charges cover the cost to prepare new designs and make the necessary changes to the drawings and specifications.

Redesign charges are variable and can cost as much as 50% of the original fee for the entire building, depending upon the extent of changes. The client and architect should negotiate appropriate fees for redesigning the project.

2 | Building Classifications

Buildings can be categorized in a variety of ways: by occupancy, building size, construction cost, and complexity. Each of these factors can have significant impacts on the fee for architectural and engineering services.

2.1 | Occupancy

Building codes in Canada divide buildings by occupancy, in part because codes must deal with or prescribe the level of public safety required for each occupancy.

Most building occupancies require the services of an architect depending upon the jurisdiction, and it is important to consult the appropriate regulations to determine any exemptions from this requirement.

Many buildings are of mixed uses, that is, they combine more than one occupancy, and this presents some challenges for the determination of fees for professional services. The following are possible methods for determining the fee for services for mixed-use buildings:

- Two separate fees are used based on the two distinct occupancies, such as an attached parking garage and another distinct use;
- A blended percentage fee is agreed upon based upon the portion of each occupancy;
- The percentage fee is based on the major occupancy.

2.2 | Building Complexity

Some provincial associations have categorized buildings by building complexity, usually from simple to complex buildings, and the categories often refer to the level of architectural services required for the building type.

The RAIC uses the following three levels of categories: Simple, Average and Complex.

"Simple" means utilitarian in character without complication of design, a minimum of finishes, and coordination of basic structural, mechanical, and electrical systems.

"Average" means conventional in character requiring coordination of the structural, mechanical, and electrical systems.

"Complex" means exceptional character and complexity of design requiring more advanced systems and coordination of complex structural, mechanical, and electrical systems. Complex projects require increased integration of the work of multiple other disciplines, such as information and communications infrastructure, security, high-performance regenerative, and power generating/ conservation systems.

2.3 | Building Size

Another factor in determining architectural fees is the building size or building area. Simple projects, with repetitive elements, may offer certain economies of scale in the provision of architectural services. Smaller projects require different detailing and are very time consuming, even though they may be of a relatively low construction cost. For small projects, such as those less than 500 square metres in size, or under 500,000 dollars in construction value, percentage fees may not always be applicable and a time basis may be recommended. Similarly, for very large projects, over 30,000 square metres in size, the fee may need to be negotiated.

2.4 | Building or Construction Cost

Another way of categorizing buildings is by their construction cost. If the fee for services is based on construction costs this becomes an important subdivision. Unfortunately, building costs can vary across the country. These costs also vary during economic cycles and due to market forces, such as supply and demand.

Standard construction cost categories may range from under $500,000 to well over $50,000,000. Generally speaking, as construction values increase, the basic percentage fee for architect's services, for certain simple building categories, decreases.

2.5 | Building Category or Building Type

Some provincial associations have subdivided buildings by type, and the categories often refer to the level of architectural services required for the particular building type. There are usually seven categories or "types" of buildings.

The RAIC has adopted the following Building Categories: Refer to Appendix D for a similar list in alphabetical order.

Category		
1	1.1	Warehouse
	1.2	Barn, Stable, Storage Building, Shed, Kennel, Animal Shelter
	1.3	Self-service Storage Building
2	2.1	Multiple Unit Residential Building (Apartment, Condominium, Dormitory, Townhouse, etc.)
	2.2	Summer Camp, Park Building
3	3.1	Armed Forces Base, Barracks, Armoury, Drill Hall
	3.2	Bowling Alley, Dance Hall
	3.3	Motel and Apartment Hotel
	3.4	Marina, Recreational Pier
	3.5	Maintenance Building, Service Garage, Service Station, Car Dealership
	3.6	Commercial or Administrative Office Building (shell only excluding tenant fit-up)
	3.7	Mercantile Buildings for Business and Personal Services including Store, Shop, Barber and Hairdressing Shop, Supermarket, Shopping Centre, Department Store (but excluding tenant layouts)
	3.8	Student or Institutional Residence, Senior Citizens' Apartment
	3.9	Kindergarten and Elementary School
	3.10	Industrial Building (such as light manufacturing)
	3.11	Specialized Agricultural Building
	3.12	Resort Building (building shell only)

		Category
4	4.1	Junior, Middle and Senior High School, Vocational High School
	4.2	Post Office and Financial Customer Service Centre (such as Bank Branches)
	4.3	Grandstand, Stadium
	4.4	Convention Hall, Exhibition Building
	4.5	Manufacturing, Processing or Specialized Storage Facility
	4.6	Dry Cleaning Establishment, Laundry
	4.7	Dairy and Creamery, Distillery
	4.8	Specialized Housing (including high-level residential support), Retirement Facility, Shelter for Homeless, Shelter for Women
	4.9	Animal Clinic
	4.10	Police Station, Fire Station, Ambulance Facility
	4.11	Hotel, Complex Motor Hotel
	4.12	Club: Town, Country, Sports, Health
	4.13	Community Centre
	4.14	Freestanding Parking Structure
5	5.1	Pedestrian Links and Bridges
	5.2	Freight Handling Terminal, Special Maintenance Garage, Aircraft Hangar
	5.3	Amusement Park Building
	5.4	Telephone Equipment Building, Data Centre, Emergency Operations Center
	5.5	Swimming Pool, Ice Arena, Recreation Building, Physical Education Building, Gymnasium
	5.6	Zoo, Animal Hospital, Botanical Gardens
	5.7	Licensed Daycare
	5.8	University or College Non-technical Classroom Building, and Vocational High School
	5.9	Cemetery Chapel, Mausoleum, Crematorium
	5.10	Funeral Home
	5.11	City Hall, Town Hall
	5.12	Museum (exhibition hall as shell non-complex program without environmental conditions)
	5.13	Restaurant, Licensed Beverage Establishment
	5.14	Church, Place of Worship, Monastery, Convent
	5.15	Long Term Care Facility, Special Care Facility (such as a Group Home)
	5.16	Minimum Security Detention Facility
	5.17	Cannabis Production Facility
6	6.1	Facility for High-level Medical Care (for active diagnostic and acute treatment), Chronic Care Facility, Mental Health Facility and Rehabilitation Facility
	6.2	Medical Research Facility
	6.3	Communications Building, Radio or TV Facility, Studio, Computer Centre
	6.4	Science Building
	6.5	Laboratory
	6.6	Dental Building, Walk-in Medical Clinic
	6.7	Observatory, Planetarium
	6.8	Museum, Art Gallery
	6.9	Courthouse, Archives Building, Library
	6.10	Aquarium
	6.11	Rapid Transit Station
	6.12	Maximum or Medium Security Detention Centre
	6.13	Airport Passenger Terminal, Bus Passenger Terminal, Rail Passenger Terminal, Seaport/Ferry Passenger Terminal
	6.14	Customs and Immigration Building
	6.15	Theatre, Opera House, Auditorium, Concert Hall
7	7.1	Custom Residence, Custom Residential Swimming Pool, Official Government Residence
	7.2	Decorative Work, Exhibition Display, Public Garden, Promenade, Fountain
	7.3	Commemorative Monument, Funeral Monument
	7.4	Air Traffic Control Tower, Control Centre, Flight Service Station
	7.5	Tenant Space Planning
	7.6	Legislative Building, Mint

NOTE: Due to increased design complexity as a result of changing user requirements, such as security, some building types have been moved to a higher category than indicated in some provincial associations' fee schedules.

3 | Definitions

Construction Budget (from RAIC Document Six):

The construction budget is the amount of money the client is committed to spend on the construction cost, as stated in Article A7 of the agreement, or an adjusted amount determined or approved by the client under the terms of this contract.

Construction Cost (from RAIC Document Six):

The construction cost is the total cost of the work to the client to construct all elements of the project designed or specified by, on behalf of, or as a result of coordination by the architect. This includes the construction contract price, cost of changes to the work during construction, construction management fees or other fees for the coordination and procurement of construction services, and all applicable taxes, except value-added taxes, which shall be excluded. Construction cost excludes the compensation of the architect and consultants, land cost, land development charges, and other professional fees.

Direct Personnel Expense:

The salary of the architect's, or architect's consultant's, personnel engaged on the project, plus the cost of such mandatory and customary contributions and employee benefits as:

- Employment taxes and other statutory benefits;
- Insurance;
- Sick leave;
- Statutory holidays;
- Vacations;
- Pensions; and
- Similar contributions and benefits.

Disbursement Record:

A record of billable reimbursable expenses.

Feasibility Study:

A report that outlines the research and subsequent analysis to determine the viability and practicability of a project. A feasibility study analyzes economic, financial, market, regulatory, and technical issues.

Fee:

The amount of compensation paid to the architect for the provision of a specific service. This does not include reimbursable expenses or disbursements.

General/Field Review:

General review, which is synonymous with field review, is a review by the architect and consultants during visits to the place of the work and, where applicable, at locations where building components are fabricated for use at the place of the work. It is completed at intervals appropriate to the stage of the construction that the architect and consultants, in their professional discretion, consider necessary to become familiar with the progress and quality of the work, and to determine that the work is in general conformity with the construction documents and to so report, in writing, to the client, the constructor, and Authorities Having Jurisdiction.

Fixed Fee:

One stated sum of money for the performance or provision of specific services.

Functional Program:

A written statement which describes various criteria and data for a building project, including operational criteria, design objectives, site requirements and constraints, spatial requirements and relationships, detailed information on rooms, furnishings, fittings and equipment, building systems and equipment, flexibility/adaptability requirements, and future expandability.

Multiplier:

A percentage or figure by which direct payroll expenses of staff (Direct Personnel Expense) are multiplied to cover payroll burden, overhead expenses, and profit.

Office Overhead:

Includes rent and utilities, office supplies, computer maintenance, automobile expenses, promotion and advertising, books and subscriptions, annual dues, leasing expenses (except as noted below), postage, delivery services, bank charges, interest charges, business taxes, donations, seminar and training expenses, and depreciation. Consultant expenses that are related to architectural services are excluded from overhead expenses, but other consultants for services such as legal, accounting, marketing, and the like are included in overhead expenses. The purchase or lease of major expenditure items, such as automobiles, computers, or office renovations, are charged as office overhead only to the extent that such expenses can be depreciated in accordance with federal policy.

Percentage Fee:

A method of compensation which links the fee for architectural services to a percentage of the construction cost of the project. The percentage will vary depending on the type of building, the construction value, and the type of construction contract.

Pre-design Services:

The architectural services provided prior to the traditional building design services that assist the client in establishing a functional program as well as the project scope, including a financial and scheduling plan.

Project Budget:

The client's estimated total expenditure for the entire project. It includes, but is not limited to, the construction budget, professional fees, contingencies, costs of land, rights of way, and all other costs to the client for the project.

CASEY HOUSE
Hariri Pontarini Architects
Photo: Hariri Pontarini Architects

MAISON DE LA LITTÉRATURE
Chevalier Morales Architectes
Photo: Chevalier Morales architectes

STADE DE SOCCER DE MONTRÉAL
SAUCIER+PERROTTE /
HCMA Architecture + Design
Photo: Olivier Blouin

Retainer:

The first payment to the architect, upon engagement, representing a stipend to cover the architect's initial work and expenses on the client's behalf. This amount is retained on the account against the eventual final billing for services on the project. Typically, the retainer is negotiated and often reflects the value of the first two months of service or one half of the value of the first phase of the commission.

Services (from RAIC Document Six):

The services means the professional services identified in Schedule A – Services, including those performed by the architect, the architect's employees, and the consultants engaged by the architect.

Value-Added Taxes (from RAIC Document Six):

Value-added taxes are those taxes levied by the federal or any provincial or territorial government including the Goods and Services Tax, the Quebec Sales Tax, the Harmonized Sales Tax, and any similar tax, the collection and payment of which are imposed by tax legislation.

4 | Other References

Provincial Associations of Architects' Schedule of Fees or Tariff of Fees

Architectural Institute of British Columbia. *Tariff of Fees for Architectural Services*. Fourth Edition. Revised February 2009.

Alberta Association of Architects. *Schedule of Designated Services for Recommended Conditions of Engagement and Schedule of Professional Fees for Building Projects*. September 2013.

Saskatchewan Association of Architects. *Bylaws of the Saskatchewan Association of Architects*. November 2002. Refer to Bylaws No. 16, 17, 18, 19, 20, 21, 22, 23, 24, and 25.

Association of Architects in Private Practice of Québec. *Standard Contract for the Services of an Architect*. November 2013.

Architects Association of New Brunswick. *Schedule of Recommended Fees*. January 7, 2011.

Newfoundland Association of Architects and Association of Professional Engineers and Geoscientists of Newfoundland. *Guidelines and Recommended Minimum Fees for Architectural and Engineering Projects*. March 2003.

Appendices

Appendix A – Fee Calculation Sheet

		FEE ADJUSTMENT FACTOR	COMMENTS
Project Number			
Project Name			
MAJOR BUILDING OCCUPANCIES			
Building Category			
Building Area			
Project Complexity			
Construction Budget			
Method of Project Delivery			
Heritage Conservation			
METHODS OF COMPENSATION TO ARCHITECT			
Fee 1 Percentage-based			
Fee 2 Hourly or Per Diem			
Fee 3 Fixed Fee			
SCOPE OF SERVICES BY PHASE			
Pre-design			
Design			
Construction Documentation			
Bidding and Contract Negotiation			
Contract Administration			
Post-construction			
Facility Management			
ADJUSTMENT FACTORS			
Construction Schedule/Fast-track			
Project Documentation			
Specialist Consultants			
Approvals			
Submittals			
New Technologies			
Third Party Certification			
Construction Contract(s) Administration			
Location			
Renovation/Vertical Additions			
Repeat Work/Repetitive Design			
Architect's Personnel			
Other			
Total Fee Adjustment Factors			
Adjusted Fees			
Fee 1 Percentage-based			
Fee 2 Hourly or Per Diem			
Fee 3 Fixed Fee			

Appendix B – Example Fees using Fee Calculation Worksheet

		FEE ADJUSTMENT FACTOR	COMMENTS
Project Number	2009-08		
Project Name	Ottawa Valley University Classroom		
MAJOR BUILDING OCCUPANCIES			
Building Category	Category 5		Non-technical Classroom
Building Area	3000 square metres		
Project Complexity	Average		
Construction Budget	$9,000,000		
Method of Project Delivery	Construction Management		
Heritage Conservation			
METHODS OF COMPENSATION TO ARCHITECT			
Fee 1 Percentage-based	7.05		
Fee 2 Hourly or Per Diem			
Fee 3 Fixed Fee			
SCOPE OF SERVICES BY PHASE			
Pre-design	N/A		
Design	Yes		
Construction Documentation	Yes		
Bidding and Contract Negotiation	Yes		
Contract Administration	Yes		
Post-construction	Additional		
Facility Management	Additional		
ADJUSTMENT FACTORS			
Construction Schedule/Fast-track	No		
Project Documentation	Multiple Tender Packages	Plus 0.25	Construction Document Phase Additional Cost of 50%
Specialist Consultants	Cost Consultant		Separate Fee for Cost Consultant
Approvals	Normal		
Submittals	Normal		
New Technologies	Green Roof	Plus 0.10	
Third Party Certification	LEED Certification	Plus 0.10	Additional Energy Analysis and Documentation
Construction Contract(s) Administration	Multiple Contracts	Plus 0.10	
Location	Normal		
Renovation/Vertical Additions	No		
Repeat Work/Repetitive Design	No		
Architect's Personnel	No Additional Personnel Required		
Other			
Total Fee Adjustment Factors		1.55	
Adjusted Fees	**7.05 x 1.55 = 10.9275**	**10.9275**	**Total Fee Approximately $983,475**
Fee 1 Percentage-based			
Fee 2 Hourly or Per Diem			For Additional Services Only
Fee 3 Fixed Fee			Additional 9,000 for Cost Consultant

Appendix C – Typical Invoice Using Percentage-based Fee

INVOICE

To: Acme Architecture Ltd.
77 Skyway Drive
Anytown, ON
Y2K 2Y2

INVOICE No. 8094
Project: Acme Office Addition
Project No.: 8051
Date: 15 March 2018
GST/HST No.: R109976007

For Professional Services Rendered:

Reference: Client-Architect Agreement
Document Six, dated June 15, 2018

Fees to: 28 February 2018

Earned to date			
Schematic Design Phase:	100% of 12.5% of 8% of $500,000	$5,000.00	
Design Development Phase:	100% of 12.5% of 8% of $500,000	$5,000.00	
Contract Documents Phase:	100% of 47.5% of 8% of $500,000	$19,000.00	
Tendering/Bidding Phase:	100% of 2.5% of 8% of $500,000	$1,000.00	
Contract Admin. Phase:	20% of 25% of 8% of $536,800	$2,147.20	
	Subtotal – Basic Services	$32,147.20	$32,147.20
Additional Services			
Change Orders 1, 2 & 3	6 hours @ $140/hour	$840.00	
	15 hours @ $85/hour	$1,275.00	
	Subtotal – Additional Service	$2,115.00	$2,115.00
	Total fee earned to date		$34,262.20
	Less previously invoiced		$28,840.50
	TOTAL FEE DUE THIS INVOICE		$5,421.70
	Reimbursable expenses due excluding GST/HST (see attached invoices)		$322.60
	Subtotal due this invoice		$5,744.30
	GST/HST @ 13%		$746.76
	TOTAL DUE THIS INVOICE		**$6,491.06**

NOTE: A statutory holdback of consulting fees, required by lien legislation in some jurisdictions, is not included in this sample invoice.

Appendix D – Alphabetical List of Buildings by Category

Administrative Office Building (shell only excluding tenant fit-up)	3
Agricultural Building (specialized)	3
Air Traffic Control Tower	7
Aircraft Hangar	5
Airport Passenger Terminal	6
Alterations	7
Ambulance Facility	4
Amusement Park Building	5
Animal Clinic	4
Animal Hospital	5
Animal Shelter	1
Apartment	2
Aquarium	6
Archives Building	6
Armed Forces Base, Armoury	3
Art Gallery	6
Auditorium	6
Barn	1
Botanical Gardens	5
Bowling Alley	3
Bus Passenger Terminal	6
Cannabis Production Facility	5
Car Dealership	3
Cemetery Chapel	5
Chancellery	7
Chronic Care Facility	6
Church	5
City Hall	5
Club: Town or Country	4
Commemorative Monument	7
Commercial or Administrative Office Building (shell only excluding tenant fit-up)	3
Communications Building	6
Community Centre	4
Computer Centre	6
Concert Hall	6
Consulate	7
Convent	5
Convention Hall	4
Courthouse	6
Crematorium	5

Custom Residence	7
Custom Residential Swimming Pool	7
Customs and Immigration Building	6
Dairy and Creamery	4
Dance Hall	3
Decorative Work	7
Dental Building	6
Distillery	4
Dormitory	2
Drill Hall	3
Dry Cleaning Establishment	4
Embassy	7
Emergency Operations Center	5
Exhibition Building	4
Exhibition Display	7
Facility for High-level Medical Care for Active Diagnostic and Acute Treatment	6
Financial Customer Service Centre (such as Bank Branches)	4
Fire Station	4
Flight Service Station	7
Foreign Mission	7
Fountain	7
Freight Handling Terminal	5
Funeral Home	5
Funeral Monument	7
Grandstand	4
Gymnasium	5
Hotel	4
Housing – Specialized Housing Including High-level Residential Support	4
Housing – Multiple Unit Residential Building (Apartment, Condominium, Dormitory, Townhouse, etc.)	2
Housing – Custom Residence	7
Ice Arena	5
Industrial Building (such as Light Manufacturing)	3
Junior, Middle and Senior High School	4
Kennel	1
Kindergarten and Elementary School	3
Laboratory	6
Laundry	4
Legislative Building	7
Library	6

Licensed Beverage Establishment	5
Licensed Daycare	5
Long Term Care Facility	5
Maintenance Building	3
Manufacturing	4
Marina	3
Mausoleum	5
Maximum or Medium Security Detention Centre	6
Medical Clinic (Walk-in)	6
Medical Research Facility	6
Mental Health Facility and Rehabilitation Facility	6
Mercantile Buildings for Business and Personal Services including Store, Shop, Barber and Hairdressing Shop, Supermarket, Shopping Centre, Department Store, (excluding tenant layouts)	3
Minimum Security Detention Facility	5
Mint	7
Monastery	5
Motel and Apartment Hotel	3
Multiple Unit Residential Building (Apartment, Condominium, Dormitory, Townhouse, etc.)	2
Museum	6
Museum (exhibition hall as shell, non-complex program without environmental conditions)	5
Observatory	6
Official Government Residence	7
Opera House	6
Park Building	2
Parking Structure (Freestanding)	4
Pedestrian Links and Bridges	5
Physical Education Building	5
Place of Worship	5
Planetarium	6
Police Station	4
Post Office	4
Processing or Specialized Storage Facility	4
Promenade	7
Public Garden	7
Radio or TV Facility	6
Rail Passenger Terminal	6

Rapid Transit Station	6
Recreation Building	5
Recreational Pier	3
Resort Building (building shell only)	3
Restaurant	5
Restoration of Historic Monument or Building	7
Retirement Facility	4
School–Junior, Middle and Senior High School	4
School–Kindergarten and Elementary School	3
Science Building	6
Seaport/Ferry Passenger Terminal	6
Data Centre	5
Self-service Storage Building	1
Senior Citizens' Apartment	3
Service Garage	3
Service Station	3
Shed	1
Shelter for Homeless	4
Shelter for Women	4
Special Care Facility (such as a Group Home)	5
Special Maintenance Garage	5
Specialized Housing Including High-level Residential Support	4
Stable	1
Stadium	4
Storage Building	1
Student or Institutional Residence	3
Studio	6
Summer Camp	2
Swimming Pool	5
Telephone Equipment Building	5
Tenant Space Planning	7
Theatre	6
Town Hall	5
TV Facility	6
University or College	5
Warehouse	1
Zoo	5

Appendix E – Scope of Services Checklist

These charts are typical checklists of services offered by the architect and their sub-consultants. The nature of each individual project, and the services customized to the client's needs, will determine the scope of services required. The checklist and table include both basic and additional services and are intended to support discussions between the client and architect to gain a shared understanding of the services required for a project. RAIC Document Six, Schedule A is also a useful document to support a discussion about project scope and services.

Basic and Additional Services, All Applicable Phases		
Structural Consulting Engineering Services	Mechanical Consulting Engineering Services	Electrical Consulting Engineering Services
Acoustic Consulting Services	Audio Visual Consulting Services	Building Sciences Consulting Services
Energy Modeling Consulting Services	Civil Engineering Consulting Services	Commissioning Agent Consulting Services
Cost Estimating Consulting Services	Food Services Consulting Services	Heritage Conservation Consulting Services
Archaeological Consulting Services	Hardware Consulting Services	Interior Design Consulting Services
Laboratory Design Consulting Services	Landscape Architect Consulting Services	Lighting Design Consulting Services
Microclimate Consulting Services	Planning Consulting Services	Project Management Services
Security Consulting Services	Security and Communications Systems Consulting Services	Traffic Consulting Services
Furniture, Fixtures and Equipment (FF&E) Selection, Procurement, and Installation Coordination	Graphic Design and Signage	Vertical Transportation Consulting Services
Multiple Construction Contracts	Coordination of Work of Client's Own Forces	Tenant Improvement Design Services
Value Engineering Services	Life Cycle Cost Analysis Services	Coordination of Client's Equipment
Climate Change Analysis	Enhanced Sustainable Design	Energy Modeling Services
Commissioning	Multiple Language Services	Sustainable Design Certification

Coordination Services, All Applicable Phases		
Project Protocols	Client Meetings	Consultant Coordination Meetings
Project Dossier	Project Reporting	Coordination of Consultants
Coordination of Multiple Constructors	Coordination of Client's Own Forces	Coordination of Client's Furniture, Fixtures and Equipment (FF&E)
Computer-Aided Design and Drafting (CADD)	Building Information Modeling (BIM)	BIM Model Manager

Authorities Having Jurisdiction Services, All Applicable Phases		
Review of Regulatory Requirements	Zoning or Land Use Amendment	Variances
Site Development Review	Development Approval or Agreement	Public Hearings
Building Permit Application		

Appendix F – Basic Services of an Architect – Narrative Description

The following describes the **basic services** of the achitect on a typical project:

1.0 Architect's Services

1.1 The architect's services consist of those services performed by the architect, the architect's employees, and the architect's consultants, set forth herein, and any additional services identified in the contract. They include the provision of normal structural, mechanical, and electrical engineering services by professional engineers when these consultants are engaged by the architect.

1.2 The architect's services include consultant coordination required to integrate all parts of the services.

2.0 Schematic Design Phase:

The architect shall:

2.1 Review the program of requirements furnished by the client and characteristics of the site;

2.2 Review and comment on the client's construction budget in relation to the client's program of requirements;

2.3 Review with the client alternative approaches to the design of the project and the types of construction contracts;

2.4 Review applicable statutes, regulations, codes, and by-laws and, where necessary, review the same with the Authorities Having Jurisdiction;

2.5 Based on the mutually agreed upon program of requirements, schedule, and construction budget, prepare for the client's review and approval, schematic design documents to illustrate the scale and character of the project and how the parts of the project functionally relate to each other; and

2.6 Prepare and submit to the client an estimate of probable construction cost based on current area or volume unit costs.

3.0 Design Development Phase:

Based on client-approved schematic design documents and agreed estimate of probable construction cost, the architect shall:

3.1 Prepare for the client's review and approval: design development documents consisting of drawings and other documents appropriate to the size of the project, to describe the size and character of the entire project including the architectural, structural, mechanical, and electrical systems, materials, and such other elements as may be appropriate;

3.2 Prepare and submit to the client for approval a revised estimate of probable construction cost; and

3.3 Continue to review applicable statutes, regulations, codes, and by laws as the design of the project is developed.

4.0 Construction Documents Phase

Based on the client-approved design development documents and agreed estimate of probable construction cost, the architect shall:

4.1 Prepare, for the client's review and approval, construction documents consisting of drawings and specifications setting forth in detail the requirements for the construction of the project;

4.2 Advise the client of any adjustments to the estimate of probable construction cost, including adjustments indicated by changes in requirements and general market conditions;

4.3 Obtain instructions from, and advise the client on, the preparation of the necessary bidding information, bidding forms, conditions of the contract, and the form of contract between the client and the contractor; and

4.4 Review statutes, regulations, codes, and by-laws applicable to the design, and where necessary, review the same with the Authorities Having Jurisdiction in order that the client may apply for and obtain the consents, approvals, licenses, and permits necessary for the project.

5.0 Bidding and Negotiation Phase

5.1 Following the client's approval of the construction documents and the latest estimate of probable construction cost, the architect shall assist and advise the client in obtaining bids or negotiated proposals, and in awarding and preparing contracts for construction.

6.0 Construction Phase – Contract Administration

6.1 During the construction phase – contract administration, the architect shall:

6.1.1 Be a representative of the client;

6.1.2 Advise and consult with the client;

6.1.3 Have the authority to act on the client's behalf to the extent provided in this contract and the construction contract documents;

6.1.4 Have access to the work at all times, wherever it is in preparation or progress;

6.1.5 Forward all instructions from the client to the contractor;

6.1.6 Carry out the general/field review of the work;

6.1.7 Examine, evaluate, and report to the client upon representative samples of the work;

6.1.8 Keep the client informed of the progress and quality of the work, and report to the client defects and deficiencies in the work observed during site reviews;

6.1.9 Determine the amounts owing to the contractor under the construction contract, based on the architect's observations and evaluation of the contractor's application(s) for payment;

6.1.10 Issue certificates for payment in the value proportionate to the amount of the construction contract, of work performed, and products delivered to the place of the work;

6.1.11 In the first instance, interpret the requirements of the construction contract documents and make findings as to the performance thereunder by both the client and contractor;

6.1.12 Render interpretations in written and graphic form as may be required with reasonable promptness on the written request of either the client or the contractor;

6.1.13 Render written findings within a reasonable time, on all claims, disputes, and other matters in question, between the client and the contractor relating to the execution or performance of the work, or the interpretation of the construction contract documents;

6.1.14 Render interpretations and findings consistent with the intent of, and reasonably inferable from, the construction contract documents; showing partiality to neither the client nor the contractor; but shall not be liable for the result of any interpretation or finding rendered in good faith in such capacity;

6.1.15 Have the authority to reject work that does not conform to the construction contract documents, and whenever, in the architect's opinion, it is necessary or advisable for the implementation of the intent of the construction contract documents, have the authority to require special inspection or testing of work, whether or not such work has been fabricated, installed or completed;

6.1.16 Review and take other appropriate action with reasonable promptness upon such contractor's submittals as shop drawings, product data, and samples, for conformance with the general design concept of the work, as provided in the construction contract documents;

6.1.17 Prepare change orders and change directives for the client's approval and signature in, accordance with the construction contract documents;

6.1.18 Have the authority to order minor adjustments in the work that are consistent with the intent of the construction contract documents, when these do not involve an ad justment in the contract price or an extension of the contract time;

6.1.19 Furnish supplemental instructions to the contractor with reasonable promptness, or in accordance with a schedule, for such instructions agreed to by the architect and the contractor;

6.1.20 Determine the date of substantial performance of the work;

6.1.21 Receive from the contractor and forward to the client, for the client's review, the written warranties and related documents;

6.1.22 Verify the validity of the contractor's application for final payment and issue a certificate of final payment; and

6.1.23 Prior to the end of the period of one year following the date of substantial performance of the work, review any defects or deficiencies that have been reported or observed during that period, and notify the contractor in writing of those items requiring attention by the contractor to complete the work in accordance with the construction contract.

Appendix G – List of Additional Architectural Services

The following is a list of some of the additional services offered by architectural practices or coordinated with special consultants.

PRE-DESIGN SERVICES

- Functional Programming
- Feasibility Studies
- Existing Site and Facilities Analysis
- Traffic and Parking Studies
- Existing Equipment and Furniture Inventories
- Energy Analysis
- Master Programming and Planning
- Environmental Studies
- Space Schematics/Flow Diagrams
- Marketing Studies
- Financial Analysis
- Project Financing
- Advisor for Architectural Competitions
- Preparation of Proposal Call Documents

POST-CONSTRUCTION SERVICES

- (Re)Commissioning Services
- Post-occupancy Studies
- Maintenance and Operational Programming
- Building Maintenance Manuals
- Post-occupancy Evaluation

SITE DEVELOPMENT SERVICES

- Site Analysis and Selection
- Site Development Planning/Site Plan Agreement
- Detailed Site Utilization Studies
- On-site Utility Studies
- Off-site Utility Studies
- Environmental Studies and Reports
- Zoning and Land Use Amendments
- Geotechnical Engineering
- Site Surveying
- Legal Survey
- Landscape Design

MATERIALS AND SYSTEMS TESTING

- Procurement of Testing Services
- Review and Analysis of Testing

INTERIOR DESIGN AND DESIGN SERVICES

- Space Planning
- Adaption of Mechanical and Electrical Systems and Other Systems to Tenant Needs
- Preparation of Furnishing Requirements
- Bidding or Purchasing Procedures for Furniture
- Furniture and Equipment Selection and Layout
- Special Furnishings Design
- Tenant-related Services
- Interior Partition Location
- Furniture and Finishing Specifications
- Selection of Interior Materials, Finishes, and Colours
- Procurement of Furniture
- Coordination of Installation and Delivery of Furniture
- Design of Interior and Exterior Signage and Symbols
- Selection or Acquisition of Fine Arts or Crafts
- Graphic Design
- Documentation of Requirements and Procurement of Graphics Work

PROJECT ADMINISTRATION AND CONSTRUCTION MANAGEMENT SERVICES

- Project Administration
- Disciplines Coordination/Document Checking
- Enhanced or Extensive Consulting with Authorities Having Jurisdiction
- Submittal Services
- Owner-supplied Data Coordination
- Schedule Development/Monitoring
- Testing and Inspection Administration
- Project Representation

- Supplemental Documentation
- Administration of Multiple Contracts
- Detailed Cost Estimates and Quantity Surveys
- Value Analysis or Value Engineering
- Life Cycle Cost Analysis
- Coordination of Mock-ups
- Facility Management
- Advocate Architect Services

PROMOTION AND PUBLIC RELATIONS

- Preparation of Press Releases
- Preparation of Promotional Brochures
- Presentations at Public Meetings
- Preparation of Leasing Material
- Preparation of Models
- Preparation of Renderings
- Condominium Documentation
- Computer Presentations

DOCUMENTATION SERVICES

- Preparation of Special Certificates and Letters of Assurance
- Certified Area Calculations
- Record Drawings and Computer Files
- Preparation of Measured Drawings
- Building Inspection and Reporting
- Aerial Site Photography
- Still Photography of Existing Conditions
- Periscope Photography of Models
- Presentation Photography of Renderings or Models
- Construction Progress Photographs
- Architectural Photography of Completed Building or Site
- Videotaping
- Computer Database
- Inventories of Materials, Equipment or Furnishings
- Building Scanning
- Creating of Building Information Model (BIM) of existing building

ARCHITECTURAL CONSERVATION

- Historic Building Documentation
- Heritage Conservation District Studies
- Conservation Reports

EXPERT WITNESS

- Testimony at Court or Hearing
- Opinion on Codes or Regulations

COMPUTER APPLICATIONS

- Computer Renderings
- 3-D Computer Presentations and Walk-throughs
- Electronic Communication and Distribution
- Computer Analysis and Mock-ups
- Project Scheduling
- Project Accounting

URBAN DESIGN

- Streetscape Design
- Drafting of Zoning Bylaws and Regulations
- Shadow Studies
- Urban Design Studies
- Wind Studies
- Land Use Studies
- Transportation Studies

RESEARCH

- Research in Construction Materials and Methods
- Building Envelope Investigation

Appendix H – Comprehensive List of Types of Consultants on the Design Team

SPECIALIST CONSULTANTS:

- Acoustical consultant
- Airport consultant
- Architectural historian
- Art consultant
- Building code consultant
- Building envelope consultant
- Computer or CAD consultant
- Conservation or heritage architect
- Construction manager
- Cost consultant
- Demographer
- Economist
- Education consultant
- Elevator consultant
- Energy management consultant
- Environmental consultant or ecologist
- Facilitator
- Facilities manager
- Food service/kitchen consultant
- Graphic artist
- Hardware consultant
- Hospital consultant
- Information technology consultant
- Interior designer
- Laboratory consultant
- Land surveyor
- Landscape architect
- Lighting consultant
- Marketing consultant
- Programmer
- Psychologist
- Public relations consultant
- Quantity surveyor
- Realtor
- Scheduling consultant
- Security consultant
- Signage or graphics consultant
- Sociologist
- Specifications writer
- Technologist
- Theatre consultant
- Translator
- Transportation planner
- Urban and regional planner
- Urban designer
- Value engineering consultant
- Wayfinding consultant
- Wind/snow studies consultant

ENGINEERING CONSULTANTS:

- Acoustical engineer
- Civil engineer
- Electrical engineer
- Environmental engineer
- Geotechnical engineer
- Hydrological engineer
- Mechanical engineer
- Process engineer
- Seismic engineer
- Structural engineer
- Traffic engineer

Appendix I – Finding, Selecting and Engaging an Architect

Selecting the right architect is one of the most significant decisions you can make on a building project

1.0 How to Find an Architect

You can find an architect in several ways, including:

- Use the RAIC online Member Directory called "Find an Architect";
- Request and review a copy of the RAIC Directory, or, if available, obtain a provincial association directory, which is produced by some of the provincial associations of architects;
- Visit architects' websites;
- Use your own experience to nominate architects that have served you well in the past;
- Ask for recommendations from other organizations or persons who may have had similar projects; or
- Advertise in a local or province-wide publication, such as the RAIC electronic Bulletin, or a provincial association's newsletter or website. If you choose to advertise, you can use the suggested wording shown in the sample advertisement on the RAIC website.

You will find the process easier if you keep the list of potential architects to a manageable number. For a small project, two architects may be sufficient; ten or more may be appropriate for a large, complicated assignment.

2.0 How to Select an Architect

There are three methods for selecting an architect:

- Quality or Qualifications-based Selection (QBS)
- Direct Selection
- Architectural Design Competition
- Low fee

2.1 Quality or Qualifications-based Selection (QBS)

More information on QBS can abe found on the RAIC website at:
https://www.raic.org/raic/qualifications-based-selection-qbs

Additional information in the OAA QBS Kit and sample templates can be found on the website of the Ontario Association of Architects (OAA) at:

http://www.oaa.on.ca/images/docs/1311598926_OAA_QBS_Introduction_Final_Aug_2010.pdf

http://www.oaa.on.ca/images/docs/1305296260_OAA_QBS_SAMPLESfillledout_Final__Sept._14.06.pdf

Finally, the Canadian Handbook of Practice for Architects includes a detailed Checklist and Guidelines for Issuing Requests for Proposals at the end of Chapter 1.2.2 – The Client.

2.2 Direct Selection

There are many good reasons why a client might select an architect directly, often because of a referral from a previous client, or the public reputation of the architect.

Architects are aware of the importance of their reputation, both on a project-specific basis and on a broader public level. Most clients rely on either formal or informal references to confirm that they are selecting the best architect for the project at hand.

More information on direct selection can be found on the RAIC website at:
www.raic.org/architecture_architects/choosing_an_architect/index_e.htm

2.3 Architectural Design Competition

Architectural Design Competitions are appropriate when an owner wishes to create a public dialogue about architecture, or where a sponsor is seeking design solutions that are very different, one from the other. More information on architectural competitions can be found on the RAIC website at:
www.raic.org/architecture_architects/architectural_competitions/index_e.htm

2.4 Low Fee

There may be limited circumstances when the selection of an architect is based on low fee. Although this method is strongly discouraged and the potential for reduced value to the client is high, in situations where there is negligible project risk and a simple and fully defined scope of work, low fee may be appropriate.

3.0 How to Engage an Architect

A clear and written agreement is essential.

The services of an architect are rendered most effectively when a clear understanding exists between the client and the architect, and it is incorporated into a written contractual agreement.

This understanding is most effectively accomplished by a thorough and clear discussion and conclusion as to:

- The scope of the services to be provided by the architect;
- The scope of services provided by subconsulting engineers and specialists to be engaged by the architect;
- The role of the architect with respect to project coordination and any subcontracts with other consultants;
- The role of the architect relative to the review of construction;
- Professional responsibility and liability;
- Project timelines;
- The method of establishing the architect's fees; and
- The method of payment for the architect's services.

When a client and architect have fully discussed and agreed upon these items, a written contract outlining all of these terms should be prepared.

The following are among many variables that will influence the level of effort needed to provide full architectural services for a given project:

3.1 Project Coordination

Coordination of the consultant team is critical to the successful completion of any building project. The architect usually undertakes this coordination. Often the architect is appointed as the prime consultant.

3.1.1 Prime Consultant

The prime consultant not only manages and coordinates the design and administration of the project but also makes sure that all members of the consultant team are properly informed of, and fulfill, their responsibilities. These coordinating duties must be compensated fairly as they are of considerable value to the owner.

3.1.2 Subconsultants

Subconsultants are usually retained by the architect but they may be engaged and retained by the client or owner. Basic engineering consultants are structural, mechanical, and electrical engineers. It is possible to establish the architect's fee in one of two ways:

1) Including the fees of the three basic engineering consultants; or
2) Without the basic engineering fee.

3.1.3 Specialist Consultants

Today there is an increasing demand for new specialist consultants. It should be noted that specialist consultants are not part of the basic services of the architect. Some of these specialist consultants are:

- Fire protection consultants;
- Life safety and code consultants;
- Security consultants;
- Building envelope consultants; and
- Information technology specialists.

All of these are in addition to many of the basic consultants.

Refer to Appendix H for a complete list of possible subconsultants.

The architect typically coordinates the specialist and subconsultants, whether or not they have been retained directly by the architect or by the owner. Compensation for this coordinating role is sometimes called a coordination fee and the amount varies depending on:

- The complexity of the project;
- The subconsultant's discipline or field of expertise; and
- The magnitude of the coordination activity.

Often the coordination fee is approximately 25-35% of the subconsultant's fee. The fee for the services of specialist consultants is always over and above the fee or normal percentage for the architect's services.

3.2 Scope of Services

As indicated above, the scope of services must be agreed upon and the purpose of this document is to determine an appropriate fee for the architect's services. . This document provides checklists for the architect and client to review related to both basic and additional services for a building project. If the client and architect agree to eliminate some services, or add additional services, the fee must be adjusted accordingly.

Refer to Appendix G for a list of additional services that architects provide.

3.3 Client's Responsibilities

The written contract or agreement sets out the services to be provided by the architect. They also identify the client's responsibility to provide information, such as:

- The requirements for the project;
- Physical specifications (such as spatial and functional relationships) or functional program;
- Legal services;
- Site conditions (such as surveys, subsurface investigation reports, designated substances (asbestos, lead, etc.) and mould, etc.); and
- The schedule for payment of fees.

The use of RAIC Document Six is recommended.

NOTE: Some provincial associations develop their own contracts for use within their province.

The following are standard contracts which are also endorsed:

- OAA Document 600 (for use in Ontario)
- AIBC Standard Form of Contract 6C between Client and Consultant (for use on projects in British Columbia with separately engaged consultants)
- AAPPQ Contract Between Client and Architect (for use in the province of Québec)

Appendix J – Typical Buildings Requiring the Services of an Architect

Unless stated otherwise, this table lists the exceptions where the design services of an architect are not required.

	Condition	**Group A –** Assembly	**Group B –** Care and Detention	**Group C –** Residential	**Group D –** Business and Personal Services **Group E –** Mercantile **Group F –** Industrial	Other	Source
British Columbia **Note:** AIBC Bulletin 31 describes those buildings for which the design is within the exclusive scope of the practice of architects.	**1**	A one-story building, other than a school building, to be used for public assembly, if the gross area exceeds 275 m^2 or the unsupported span exceeds 9 m.	A hospital or similar building occupancy with 13 or more beds.	An apartment or residential building containing 5 or more dwelling units.	A commercial or industrial building, or combination of both with other occupancies, in excess of 470 m^2 gross area, being the aggregate area of all floors.	Any other building in excess of 470 m^2 gross area, being the aggregate of all floors, including mixed-use buildings. A mixed-use building that contains assembly occupancy is assessed by the most restrictive use and therefore requires an architect when it exceeds 235 m^2.	AIBC Bulletin 31, May 6, 2017 (Summary of the Architects Act, Section 60).
	2	A building of more than one story, other than a school building, to be used for public assembly, if the gross area exceeds 235 m^2.	A veterinary hospital in excess of 470 m^2 gross area.	A hotel, or similar occupancy, containing 11 or more guest rooms for transient or permanent occupancy.			
	3	All schools, any size					
Manitoba **Note:** The Architects Act describes those buildings, the design of which is within the exclusive scope of the practice of architects.	**1**	All buildings, except arenas with a fixed seating capacity of 1000 people or less, require an architect or engineer.	All buildings.	A building exceeding 600 m^2 in building area or exceeding 3 storeys in building height.	A building exceeding 600 m^2 in building area or exceeding 3 storeys in building height.		The Architects Act, Section 25, April; 20, 2018 and the Buildings and Mobile Homes Act, Regulation 31/2011.
	2				F2/3: A building exceeding 600 m^2 in building area or exceeding 3 storeys in building height.		
	3				F1: All buildings (architect or engineer).		
Alberta	**1**	A building, 3 storeys or less in height that:		A building, 3 storeys or less in height, for residential occupancy of hotel, motel, or similar use that:	A building, 3 storeys or less in height that:	A building that is a farm building not for public use.	Architects Act, Chapter A-44, April 30, 2015.
	2	In the case of a single storey building has a gross area of 300 m^2 or less;		In the case of a single storey building has a gross area of 400 m^2 or less;	In the case of a single storey building has a gross area of 500 m^2 or less;	A relocatable industrial camp building.	
		In the case of a 2-storey building has a gross area of 150 m^2 or less on each floor; and		In the case of a 2-storey building has a gross area of 200 m^2 or less on each floor; and	In the case of a 2-storey building has a gross area of 250 m^2 or less on each floor; and	Interior design.	
		In the case of a 3-storey building has a gross area of 100 m^2 or less on each floor.		In the case of a 3-storey building has a gross area of 130 m^2 or less on each floor.	In the case of a 3-storey building has a gross area of 165 m^2 or less on each floor.		
	3			A single-family dwelling.			
	4			A multiple family dwelling containing 4 dwelling units or less.			

	Condition	**Group A –** Assembly	**Group B –** Care and Detention	**Group C –** Residential	**Group D –** Business and Personal Services **Group E –** Mercantile **Group F –** Industrial	**Other**	**Source**
Saskatchewan	**1**	Any building conforming to the scope of NBCC Part 9.				Any farm building	Architects Act, Section 23, Scope of Practice.
	2					Interior design.	
Ontario	**1**	Architect required.		A building that is not more than 3 storeys and not more than 600 square metres in gross area.	A building that is not more than 3 storeys and not more than 600 square metres in gross area.	A building used directly in the extraction, processing, or storage of ore from a mine.	Architects Act, Section 11, April 18, 2018.
	2			A building that is not more than 3 storeys and contains 1 dwelling unit or 2 attached dwelling units constructed directly on grade.		Interior design.	
	3			A building that is not more than 3 storeys and not more than 600 m^2 building area, containing 3 or more dwelling units.			
Ontario – Licensed Architectural Technologist (limited scope of practice)	**1**	A building that is not more than 3 storeys and not more than 600 square metres in gross area, used for a restaurant designed to accommodate not more than 100 persons consuming food or drink.		A building that is not more than 3 storeys and not more than 600 square metres in gross area.	A building that is not more than 3 storeys and not more than 600 square metres in gross area.	A building used directly in the extraction, processing, or storage of ore from a mine.	**Policy Statement:** Policy of the Council of the OAA with respect to applications for a license and certificate of practice by holders of a certificate of qualification to make an application as a Licensed Technologist issued by the Ontario Association of Applied Architectural Sciences (OAAAS), January 2017.
	2			A building not more than 4 storeys and contains 1 dwelling unit or 2 attached dwelling units.		Interior design.	
	3			A building not more than 4 storeys and not more than 600 m^2 in building area, containing 3 or more dwelling units.			
Quebec	**1**	Architect required.		A semi-detached or attached single-family dwelling unit, a multi-family dwelling that contains no more than four units, that is not more than two storeys and not more than 300 square metres in gross area after the work is completed and has a single basement level.	A business, mercantile, or industrial occupancy that is not more than 2 storeys, not more than 300 square metres in gross area after the work is completed, and has a single basement level.	Or a combination of such dwellings or occupancies that is not more than 2 storeys and not more than 300 square metres in gross area after the work is completed, and has a single basement level.	Architects Act; R.S.Q. Chapter A-21, Section 16.
	2			A detached single-dwelling unit.			

	Condition	**Group A –** Assembly	**Group B –** Care and Detention	**Group C –** Residential	**Group D –** Business and Personal Services **Group E –** Mercantile **Group F –** Industrial	Other	Source
New Brunswick		Architect required.		A building that is not more than 3 storeys and not more than 600 square metres in gross area.	A building that is not more than 3 storeys and not more than 600 square metres in gross area.	Interior design.	Architects Act of New Brunswick, January 1998.
Nova Scotia	**1**	A building that is not more than 1 storey and not more than 200 square metres in building area.	Architect required.	A building that is not more than 3 storeys and not more than 450 square metres in building area.	A building that is not more than 3 storeys and not more than 450 square metres in building area (D, E, F2, F3).	Interior design.	Architects Act, November 23, 2006.
	2			One-dwelling or a 2 dwelling unit.	A building that is not more than 1 storey and not more than 200 square metres in building area (F1).		
Prince Edward Island	**1**	Architect required.		A building that is not more than 3 storeys and contains 1 dwelling unit or 2 attached dwelling units constructed directly on grade.	Not permitted.	A building used directly in the extraction, processing, or storage of ore from a mine.	Architects Act, Chapter A-18.1, March 31, 2000.
	2			A building that is not more than 3 storeys and not more than 600 m^2 in building area, containing 3 or more dwelling units constructed directly on grade with no units above another.		Interior design.	
Newfoundland and Labrador	**1**	A building, in whole or in part, used or intended for assembly occupancy only, where the building's total occupant load does not exceed 50 persons.	Architect required	A detached or semi-detached house or row housing, with or without a subsidiary apartment.	A building where the total area of all floors located at and above the lowest outside grade does not exceed 300 m^2, and the building does not contain more than one dwelling unit (D & E).	Interior design.	Architects Act, 2008.
	2			A building containing only residential units, having a maximum of 15 bedrooms, where access to each unit is only from the exterior.	A building, in whole or in part, used or intended for industrial occupancy only, where the building's total occupant load does not exceed 50 persons.		
	3			A lodging house or bed and breakfast establishment where the maximum number of guest bedrooms does not exceed 4.			
Northwest Territories	**1**	Architect required.		A building that is not more than 3 storeys and not more than 600 square metres in gross area.	A building that is not more than 3 storeys and not more than 600 square metres in gross area (D, E, F1, F2).	A building that is a farm building not for public use.	Architects Act; SNWT, 2001 cp.10.
	2					A relocatable industrial camp building.	

TABLE 9 *Scope of Design Services in the Practice of Architecture*

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Attachment 7

JT1.12 – Fee Calculation

Appendix A – Fee Calculation Sheet

		FEE ADJUSTMENT FACTOR	COMMENTS
Project Number	2123.00		
Project Name	ERTH Power Headquarters Building		
MAJOR BUILDING OCCUPANCIES			
Building Category	Category 3		Excludes Interior Office Design
Building Area	TBD		
Project Complexity	Complex	Plus 0.5%	PV system, Ground Source Heating, Interior Design of Offices not included in Category 3
Construction Budget	$20,000,000		
Method of Project Delivery	Design, Bid, Build		Include Prequalification of GCs
Heritage Conservation	N/A		
METHODS OF COMPENSATION TO ARCHITECT			
Fee 1 Percentage-based	9.43%		
Fee 2 Hourly or Per Diem	N/A		
Fee 3 Fixed Fee	N/A		
SCOPE OF SERVICES BY PHASE			
Pre-design	N/A		
Design	Yes		
Construction Documentation	Yes		
Bidding and Contract Negotiation	Yes		
Contract Administration	Yes		
Post-construction	Considered Additional Services		
Facility Management	Considered Additional Services		
ADJUSTMENT FACTORS			
Construction Schedule/Fast-track	N/A		No Fast-track being considered
Project Documentation	N/A		No multiple tender packages
Specialist Consultants	Civil Engineer	Plus 0.75%	Additional to Base Arch, Struct, Mech, Elect
Approvals	N/A		Assuming only Site Plan Approval and Building Permit is required
Submittals	Normal		
New Technologies	N/A		PV system, Ground Source Heating included Above
Third Party Certification	N/A		
Construction Contract(s) Administration	Normal		
Location	Normal		
Renovation/Vertical Additions	N/A		
Repeat Work/Repetitive Design	N/A		
Architect's Personnel	Normal		
Other	N/A		
Total Fee Adjustment Factors		Plus 1.25%	
Adjusted Fees	9.43% + 1.25% = 10.68%	10.68%	Total Fee Approximately = $2,136,000
Fee 1 Percentage-based		10.68%	
Fee 2 Hourly or Per Diem			For Additional Services
Fee 3 Fixed Fee			N/A

Range of Percentage Fees with Architectural and Basic Engineering Fees for "Average"' Projects

Base Percentage Fee by Building Category (in millions) – *New Construction* WITH Basic Engineering (structural, mechanical, and electrical ONLY)								
CONSTRUCTION COST / BUILDING CATEGORY	<$500,000	$500,000 to <$1M	$1M to <$2M	$2M to <$5M	$5M to <$10M	$10M to <$25M	$25M to <$50M	<$50 million
1	9.22	8.17	7.85	7.76	7.55	7.34	7.13	Fees for projects with a construc-tion value above $50m to be negoti-ated
2	10.26	9.39	8.91	8.80	8.60	8.38	8.17	
3	11.32	10.26	9.96	9.85	9.64	9.43	9.22	
4	12.36	11.32	11.00	10.89	10.68	10.47	10.26	
5	13.41	12.36	12.05	11.95	11.74	11.53	11.32	
6	14.45	13.41	13.09	13.00	12.78	12.57	12.36	
7	18.48	17.60	17.28	17.00	16.14	15.46	14.95	

TABLE 6 *Average Fees for Basic Architectural and Engineering Services*