

Respect ♦ Integrity ♦ Excellence ♦ Leadership

Serving
GOVERNMENT,
Serving
CANADIANS.

Procurement models for District Energy System Projects

IDEA Conference

Presented by Tomasz Smetny-Sowa, Senior Director
Energy Services Acquisition Program
June 13, 2018

Real Property Services Branch
Public Services and Procurement Canada



Public Services and
Procurement Canada

Services publics et
Approvisionnement Canada

Canada

Program Overview

The **Energy Services Acquisition Program (ESAP)** is modernizing the District Energy System (DES) which provides heating services to over 80 buildings and cooling services to 67 buildings in the National Capital Region (>1.6M m² of floor space), accommodating 55,000+ occupants

There are **two stages** to ESAP:

- Stage 1: DES Modernization
- Stage 2: Deeper Greening



ESAP Has Two Stages

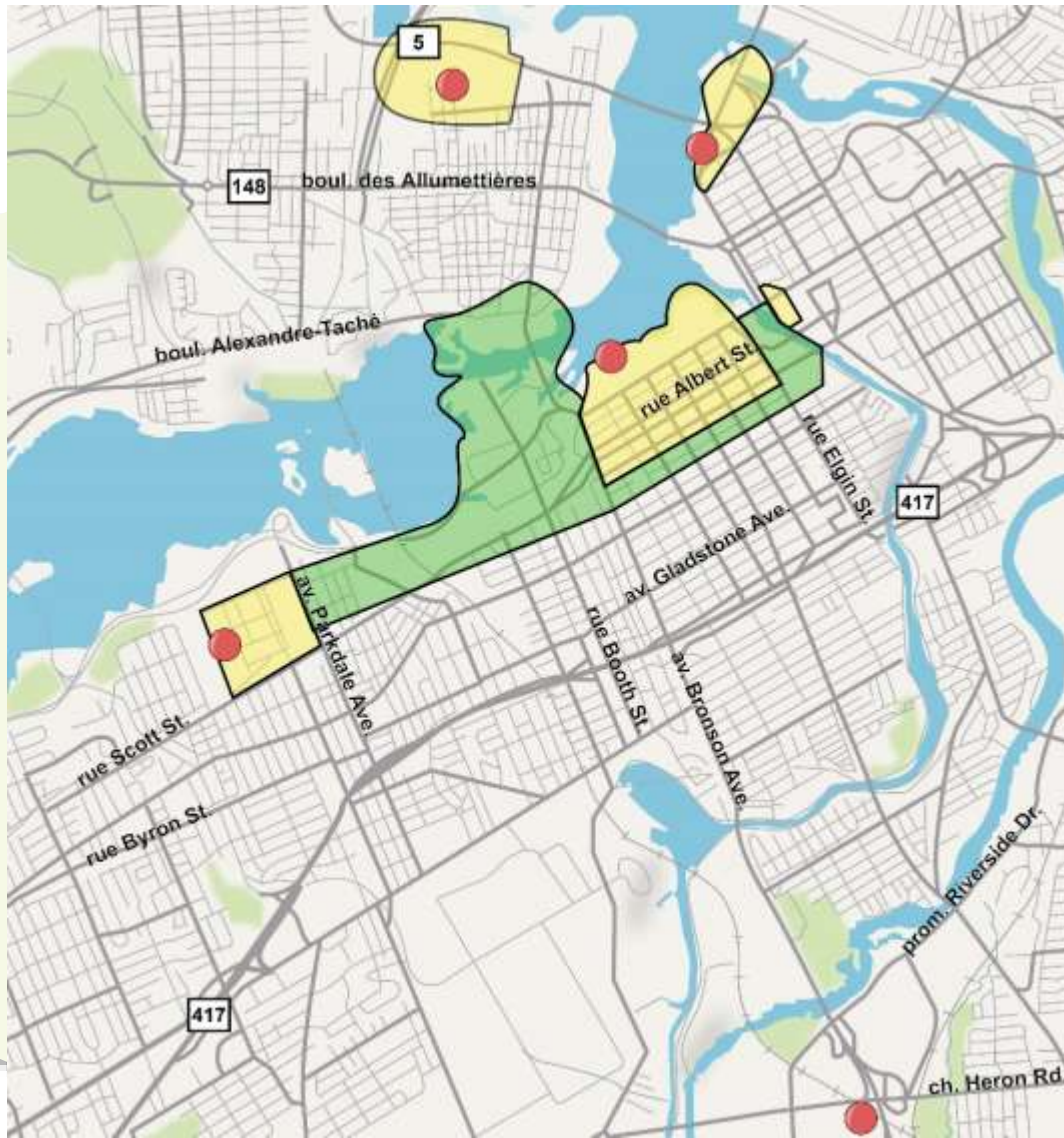
Stage 1 – DES Modernization

- Convert to industry-standard low temperature hot water technology (LTHW)
- Switch from steam driven to electric chillers
- Implement Smart Buildings data analysis to improve efficiency
- Test new carbon neutral fuels for deeper greening - pilot projects, feasibility studies

Stage 2 – Deeper Greening

- Convert base load to carbon neutral fuels – achieve **low carbon government**
- Increase the number of government buildings connected to the DES
- Expand and share carbon neutral energy with non-federal buildings in the community





Expansion

- Existing Plants
- Existing DES Service Area
- Potential DES Growth and Expansion



Capital Structures and Procurement Options

For District energy projects, comprehensive solutions (via Alternative Finance Procurements) are attractive options that can meaningfully transfer many project risks to the Private sector.



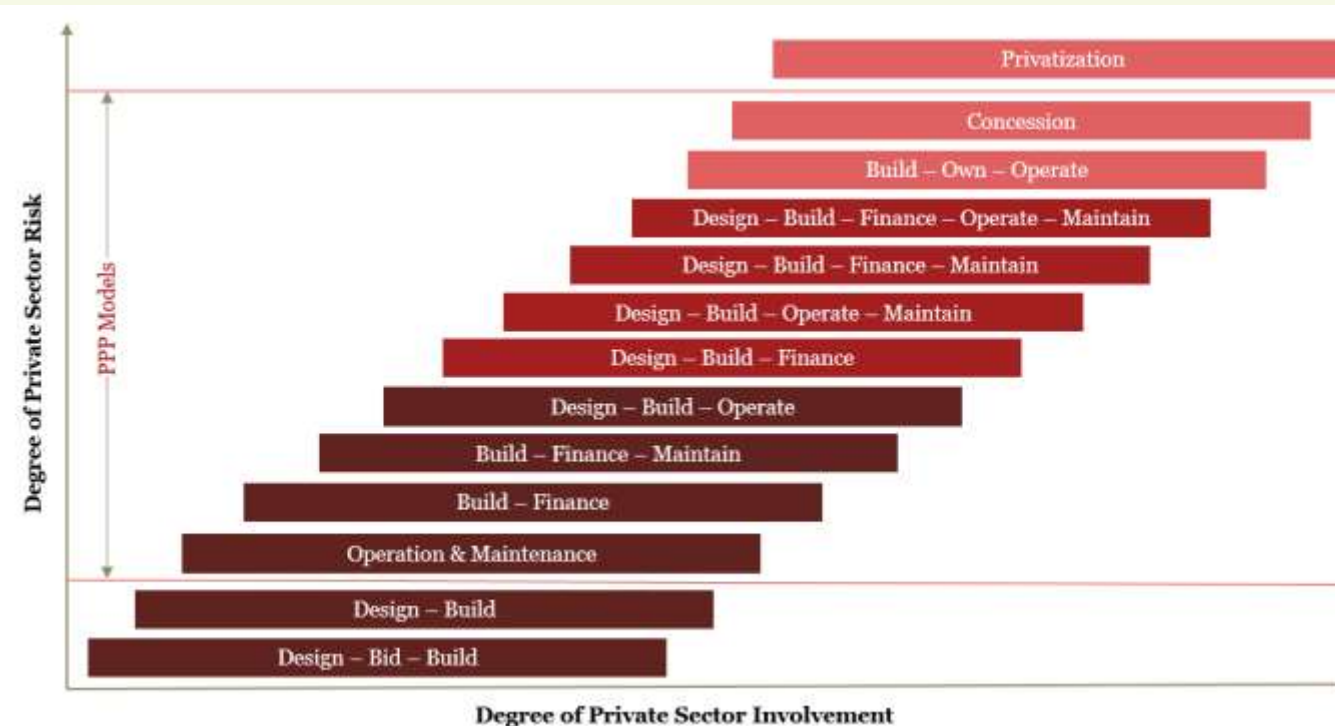
Government should retain risks that are inherently governmental	Shared Risks	Private sector may manage risks that are inherently commercial
<ul style="list-style-type: none"> • Changes to scope and specification • Planning permission, permitting • Demand risk • Latent defects (some) • Lands 	<ul style="list-style-type: none"> • Inflation • Regulatory 	<ul style="list-style-type: none"> • Design, construction, commissioning • Operating and maintenance costs • Operating performance • Technology obsolescence • Project Financing • Latent defects (some)

Risk Transfer



Capital Structures and Procurement Options

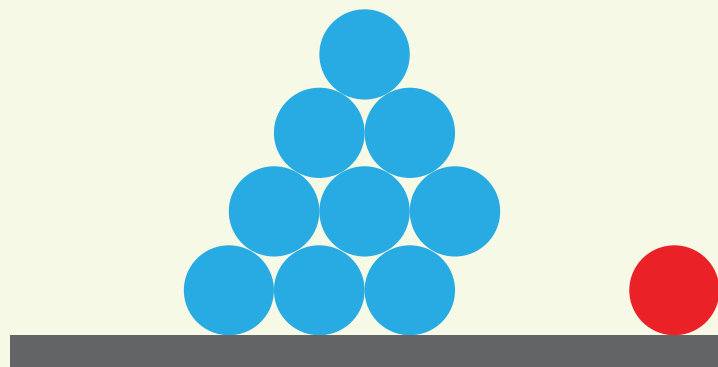
As the degree of risk-transfer increases, so do the Private Partner's liabilities via involvement. Consequently, more rigid contract structures are typically required for their protection.



Objectives

ESAP's objectives include leveraging private-sector expertise and innovation over the long-term, balanced with a need to retain operational flexibility for future growth and adaptability.

Custom solution using AFP principles



DE systems can evolve over time; AFP models offer building blocks for custom solutions.

Capital Structures and Procurement Options

Project-specific considerations, prioritized by the project owner, are important to procurement model decision making.

Qualitative Factor Examples		Considerations
1	<u>Budget Certainty</u>	Achieve on-budget delivery without cost overruns and additional claims. Essential to not exceed affordability constraints.
2	<u>Schedule Certainty</u>	Achieve on-time delivery without schedule delays during the construction period. Schedule delays prevent the timely availability of the assets for the community.
3	<u>Service-Level Accountability and Sponsor's Rights</u>	Achieve meaningful risk transfer through contract mechanisms that define availability and performance standards during Construction and O&M Phases, with adequate intervention rights for the project owner.
4	<u>Operational Flexibility</u>	Flexibility to update operational requirements once the system is in service. The degree to which staffing, operational processes, maintenance and rehabilitation schedules can be changed throughout the operating period.



These example qualitative factors can be mapped against short-listed procurement models to identify relative suitability. Qualitative multi-criteria evaluation example:

Budget Certainty		
Procurement Model	Score	Rationale
Design-Bid-Build	<p>Low</p> <p>(Minimally meets the objective)</p>	<ul style="list-style-type: none"> • DBB contracts frequently encounter cost overruns and contractor claims during construction. • Operational costs are seldom fully understood or budgeted for under this model.
Design-Build-finance-Operate-Maintain (short term financing)	<p>High</p> <p>(Fully meets the objective)</p>	<ul style="list-style-type: none"> • Capital payments are fixed to the Private Partner's proposal price unless the Authority asks for a change. • Operational costs are fixed to the Private Partner's proposal, and security is offered via prescribed security package of Letters of Credit and other guarantees as required.
Design-Build-Finance-Operate-Maintain (long term financing)	<p>High</p> <p>(Fully meets the objective)</p>	<ul style="list-style-type: none"> • Capital payments are fixed to the Private Partner's proposal price unless the Authority asks for a change. • Operations, maintenance, and lifecycle also included in the contract over a long-term operating period at a fixed price based on the Private Partner's proposal price unless the Authority asks for a change.



Qualitative multi-criteria evaluation example (continued):

Schedule Certainty		
Procurement Model	Score	Rationale
Design-Bid-Build	<p>Low</p> <p>(Minimally meets the objective)</p>	<ul style="list-style-type: none"> • Separate engineering design and construction contracts pose interface delay risks and many self-imposed obligations. • Delays in construction schedule common due to design error, contractor claims, etc. • There is not sufficient private financing at risk to fully incentivize on-time delivery.
Design-Build-finance-Operate-Maintain (short term financing)	<p>High</p> <p>(Fully meets the objective)</p>	<ul style="list-style-type: none"> • Integrated contract for design and construction requirements resulting in schedule efficiencies. • On-time delivery incentivized due to private financing at risk and typical requirement to achieve substantial completion before payment issued.
Design-Build-Finance-Operate-Maintain (long term financing)	<p>High</p> <p>(Fully meets the objective)</p>	<ul style="list-style-type: none"> • Integrated contract for design and construction requirements resulting in schedule efficiencies. • On-time delivery incentivized due to private financing at risk and typical requirement to achieve substantial completion before payment issued. • Operational term security package and performance liability established form of long-term debt and equity.



Qualitative multi-criteria evaluation example (continued):

Service-Level Accountability and Sponsor's Rights		
Procurement Model	Score	Rationale
Design-Bid-Build	<p>Low</p> <p>(Minimally meets the objective)</p>	<ul style="list-style-type: none"> • No formal availability and performance indicators • No security packages during operations • Operations contracts are independent from design and construction contracts • Latent defect on new assets and non-performance risk is retained by the sponsor
Design-Build-finance-Operate-Maintain (short term financing)	<p>Medium - High</p> <p>(Meets the objective very well)</p>	<ul style="list-style-type: none"> • Construction agreement in place to deliver full construction of assets, certified independently. • Agreement in place for operating period is calibrated to availability and performance indicators. • Agreement not backed by long-term financing; security packages sized to provide sponsors <i>adequate</i> capital at risk • Latent defect on new assets and non-performance risk is transferred to the PP
Design-Build-Finance-Operate-Maintain (long term financing)	<p>High</p> <p>(Fully meets the objective)</p>	<ul style="list-style-type: none"> • Construction agreement in place to deliver full construction of assets, certified independently. • Agreement in place for operating period is calibrated to availability and performance indicators. • Agreement backed by long-term financing with <i>significant</i> capital at risk; • Latent defect on new assets and non-performance risk is transferred to the PP



Qualitative multi-criteria evaluation example (continued):

Operational Flexibility		
Procurement Model	Score	Rationale
Design-Bid-Build	<p>High</p> <p>(Fully meets the objective)</p>	<ul style="list-style-type: none"> • This model does not include an operating contract and is therefore fully flexible in terms of operational requirements. • Future capital expansions or rehabilitations are uncomplicated and pose no interface risk to undertake.
Design-Build-finance-Operate-Maintain (short term financing)	<p>Medium</p> <p>(Adequately meets the objective)</p>	<ul style="list-style-type: none"> • This model's operating contract and is flexible in terms of operational requirements, particularly where the potential future needs can be partially predicted. • Change orders could be resisted, but major disagreements resulting in termination are relatively low-cost • Future capital expansions or rehabilitations are uncomplicated and pose no interface risk to undertake.
Design-Build-Finance-Operate-Maintain (long term financing)	<p>Low</p> <p>(Minimally meets the objective)</p>	<ul style="list-style-type: none"> • This model includes a long-term operating contract at a fixed price associated with distinct responsibilities. • Change orders could be resisted, but major disagreements resulting in termination can be very costly to the project sponsor • Future capital expansions or rehabilitations are potentially challenging if new works affect private operator processes and responsibilities.



Based on some of the project-specific priorities evaluated, the qualitative multi-criteria evaluation example summary results:

	DBB	DBF + OM	DBFOM
Budget Certainty	Low	High	High
Schedule Certainty	Low	High	High
Service-Level Accountability and Sponsor's Rights	Low	Medium-High	High
Operational Flexibility	High	Medium	Low

This process can bring focus to project-specific priorities and options.



Risk Allocation

Risks and Responsibilities	Risks and responsibilities principally assigned to:	
	Private Partner	Canada
Approvals and Permits		
Initial CEEA environmental assessment approval		√
Compliance with environmental regulations	√	
National Capital Commission land use approvals		√
National Capital Commission design approvals	√	
Construction and municipal permits	√	
Operating permits	√	
Transition Period		
Operation, maintenance and rehabilitation of Existing National Capital DES		√
Efficiency of Existing National Capital DES		√



Risks and Responsibilities	Risks and responsibilities principally assigned to:	
	Private Partner	Canada
Design and Construction Work Period		
Operation, maintenance and rehabilitation of Existing National Capital DES	√	
Efficiency of Existing National Capital DES		√
Latent defect risk of Existing Building Structures and Existing Tunnel Structures	√	√
Design and construction of the Modernized National Capital DES	√	
Building conversions to LTHW		√
Cost overruns	√	
Delays	√	
Relocation of public utility infrastructure	√	
Contamination - known conditions or resulting from construction and O&M activities for which the Private Partner is responsible	√	
Contamination – unknown conditions	√	√
Geotechnical risks - known conditions	√	
Geotechnical risks – unknown conditions		√
Testing & commissioning	√	



Risks and Responsibilities	Risks and responsibilities principally assigned to:	
	Private Partner	Canada
Modernized National Capital DES Operational Term		
Operation, maintenance and rehabilitation of the Modernized National Capital DES	√	
Efficiency and reduction of GhG emissions of the Modernized National Capital DES	√	
Latent defect risk of Existing Building Structures and Existing Tunnel Structures	√	√
Building demand, building energy consumption and commodity price risk		√
Selection, procurement, management and optimization of the input fuel	√	√
Meter reading	√	
Handback Requirements	√	




Expansion

Risks and Responsibilities	Risks and responsibilities principally assigned to:	
	Private Partner	Canada
Expansion		
Marketing activities	√	√
Energy Supply Agreements		√
Design of rate structures associated with energy services for Users		√
Identification of work required	√	√
Capital investment decisions		√
Design and construction	√	
O&M Work	√	
Customer services		
Meter reading	√	
Customer billing and payment management		√
Help Desk services: emergencies, clients' requests linked with the National Capital DES	√	



Alternative finance procurements can be very good options for large and complex infrastructure assets; DBFOMs work well for fixed-scope assets (e.g. bridges and hospitals with no expansion options)

A silhouette of a city skyline in a brownish-gold color, featuring various building shapes and a central tower with a spire. The skyline is positioned behind a dark brown rectangular box containing white text.

For ESAP, budget and schedule certainty are achieved via a DBF-style AFP; O&M services are simultaneously bid with a security package instead of LT financing



Thank you.



Entrance to Chilled Water Plant in Paris

Tomasz Smetny-Sowa, Senior Director
Energy Services Acquisition Program
Public Services and Procurement Canada
tomasz.smetny-sowa@tpsgc-pwgsc.gc.ca

