



# IDEA 2021

Powering the Future: District Energy/CHP/Microgrids

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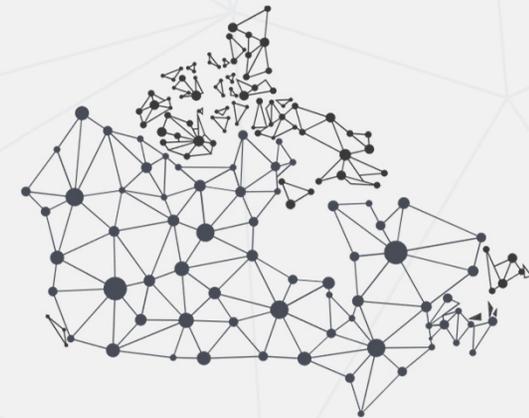


# From Explosion to Renovation – The 10 Year Journey to Project Initiation in Ottawa

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Tomasz Smetny-Sowa, Senior Director  
Energy Services Acquisition Program (ESAP)  
Public Services and Procurement Canada (PSPC)

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Public Services and  
Procurement Canada

Services publics et  
Approvisionnement Canada

Canada

# History of ESAP



# Creation of ESAP- May 2009

- ◆ In the 2000s, the Department of Public Works began looking at options for upgrading the aging infrastructure of its district energy system
- ◆ Many components installed in the 1950s and 60s were still being used
- ◆ Energy Services Acquisition Program (ESAP) is created



View of the Cliff Plant in 1920

# Explosion and Temporary Plant

- ◆ On Oct. 19, 2009, one of six boilers exploded at the Cliff and a worker died from injuries
- ◆ In 37 days, a temporary plant was put in place through extraordinary effort, with teams working around the clock
- ◆ The temporary plant is still in operation today



View of the Cliff Plant after Temporary Plant was installed in 2009

# Outreach to Industry

- ◆ From 2009 to 2015 ESAP went to the private sector with three Requests for Information (RFIs) to learn about the options for upgrading, and visits were made to other district energy systems in Europe and North America.
- ◆ In addition, Price Waterhouse Coopers (PWC) completed two market soundings on behalf of ESAP.



Temporary plant at Cliff Street installed after explosion

# Options Analysis

- ◆ ESAP considered a number of contracting options including several variations of public-private partnerships (P3s). All forms of P3 contracting options ranked ahead of alternative service delivery and Design-Bid-Build (Crown-Construct) with operations and maintenance by PSPC.

## Criteria

- Achieves PSPC environmental targets
- Increases system reliability
- Determines funding and financing
- Leverages private sector expertise and innovation
- Meets PSPC business objectives
- Transfers business risks
- Flexible to future load requirements
- Addresses stakeholder concerns
- Provides client and user satisfaction

# Approval in Budget 2016

- ◆ In Budget 2016, the Government announced that it will invest up to \$2.1 billion towards repairs and retrofits to its wide range of properties and buildings, as well as the greening of government operations
- ◆ The upgrades to the district energy system were part of this investment



Formal announcement of Funding for ESAP project

# Thank you

**Tomasz Smetny-Sowa**

*Energy Services Acquisition Program*

*Public Services and Procurement*

*Canada*

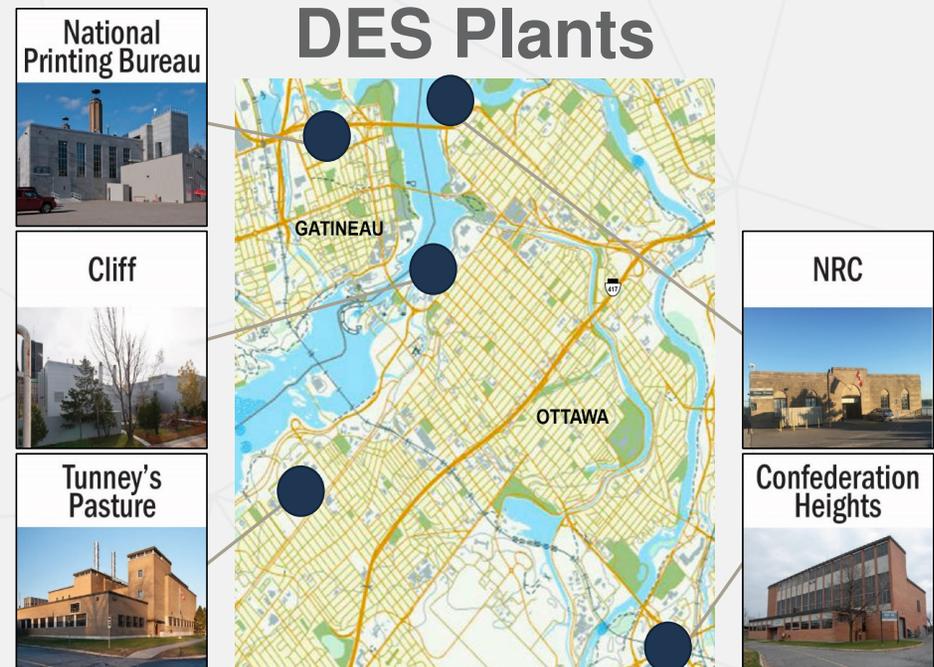
*[Tomasz.Smetny-Sowa@tpsgc-](mailto:Tomasz.Smetny-Sowa@tpsgc-pwgsc.gc.ca)*

*[pwgsc.gc.ca](mailto:Tomasz.Smetny-Sowa@tpsgc-pwgsc.gc.ca)*



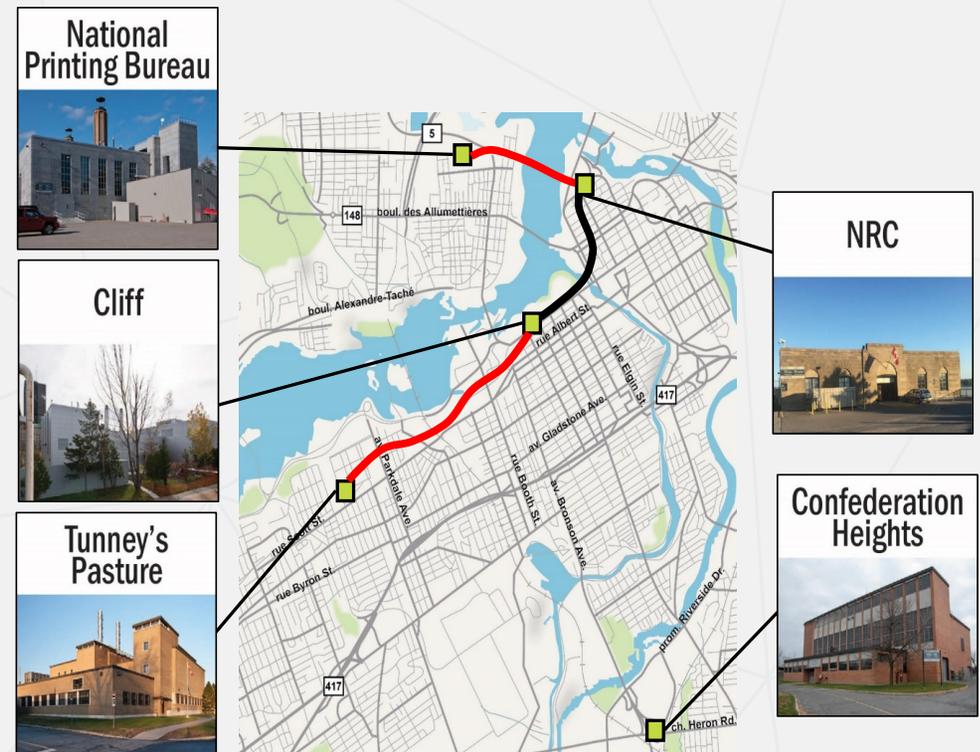
# What ESAP Started With

- ◆ Five independent District Heating and Cooling Systems
  - ◆ Steam-based
- ◆ Located in two provinces
- ◆ Modernizing to convert steam to Low Temperature Hot Water
- ◆ Chilled water upgraded to centrifugal chillers



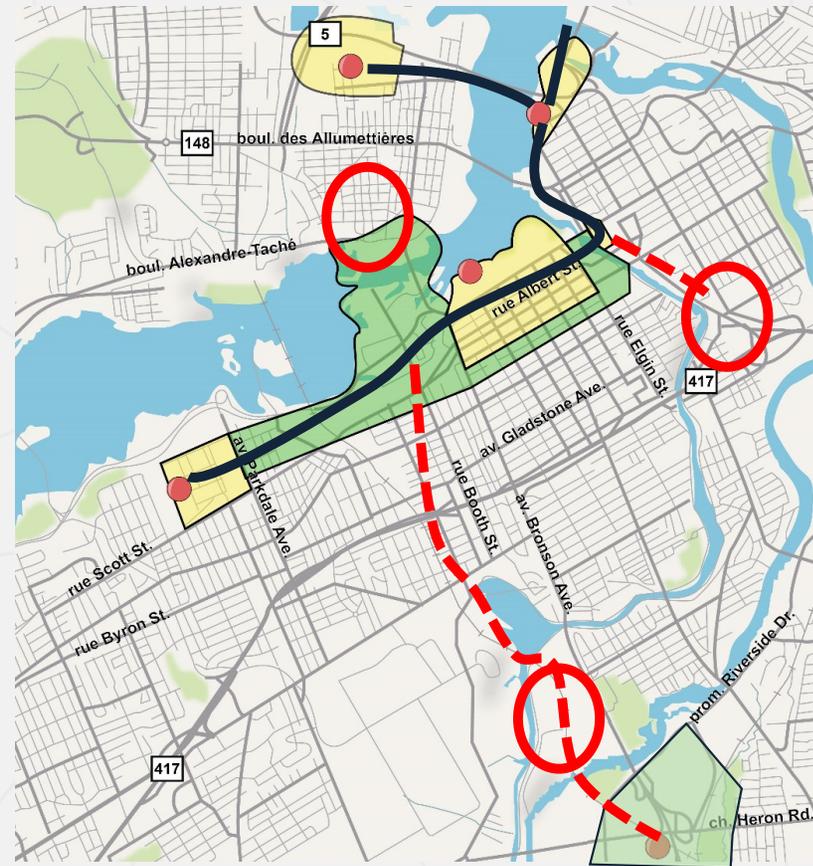
# Where We Pivoted To

- ◆ Interconnected systems
- ◆ Leverage provincial utility rates
- ◆ Share green energy with more users



# Growth Potential (Future)

- ◆ Downtown Ottawa
- ◆ Downtown Gatineau
- ◆ Universities



# Structuring the Technical Requirements

- ◆ Focus on performance rather than prescriptive requirements
- ◆ Establishing main objectives:
  - ◆ Improve environmental performance
  - ◆ Reduce costs
  - ◆ Reduce risk
  - ◆ Leverage private sector know how
  - ◆ Setup for future growth



# Appropriate Risk Sharing

## ◆ Owner

- ◆ Existing conditions
- ◆ Latent risk
- ◆ Lands (NCC)
- ◆ Permitting, approvals (some)

## ◆ Private Partner

- ◆ Design innovation
- ◆ Integrated design
- ◆ Construction expertise
- ◆ Schedule (subject to PA)



*\*\*\*put the risk in the hands of those most capable of managing it\*\*\**

# Procurement Strategy

## RFQ

- ◆ Focus on qualifications
- ◆ Identify skill limitations:
  - ◆ District heating and cooling experience
  - ◆ Direct buried distribution piping
  - ◆ EN253 systems
  - ◆ Central chilled water plants
- ◆ Value broad skills and experience
- ◆ Value Canadian context

## RFP

- ◆ Focus on proposals
  - ◆ Concepts
  - ◆ Key individuals
  - ◆ Innovation
- ◆ Structure to mitigate industry skill limitations
  - ◆ Evaluation criteria
- ◆ Focus on desired outcomes
  - ◆ Performance

# Thank you

**Jim Manson**

*FVB Energy*

[jmanson@fvbenergy.com](mailto:jmanson@fvbenergy.com)





# IDEA Conference

## **ENGIE's Journey with Ottawa's ESAP Project**

Austin, Septembre 2021

INTERNAL

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# ESAP RFQ Objectives

-  ● Improve the Government of Canada's Energy Management Performance
-  ● Reduce the Costs of Heating and Cooling Operations for the Government of Canada
-  ● Increase Safety and Reliability of Heating and Cooling Operations
-  ● Collaborate with the Private Sector and utilize their Innovation, Capacity and Expertise
-  ● Modernize the District Energy System with the potential for DES expansion throughout the NCR
-  ● Integrate an Education Platform as part of System Transformation and Operation
-  ● Design and build the Cliff Plant to be an architectural landmark and learning centre



## The ESAP RFQ Objectives and Deliverables guided our Strategy Pursuit Plan and Partnership Agreements



- Innovate Energy consists of ENGIE, PCL Construction, Black & McDonald, WSP and bbb Architects
  - ENGIE is the Operations and Maintenance (O&M) Partner for the 35 Year Contract Period
  
- Pursuit Strategy included; Demonstrating Skills and proven DES experience across all Project Phases.
  
- Project Phases;
  - Transition of existing Operations and District Energy Infrastructure
  - Design & Construction + Validation Phase. Develop O&M responsibilities for New DES
  - Modernized Phase (O&M Phase)



Project Phase	Indicative Duration	Estimated Timeline	Milestone
Transition Phase	6-12 months	2019-2020	Transfer of Existing Infrastructure
Design and Construction Phase	5 years	2020-2025	Substantial Completion of Project recapitalization
Validation Period	2 years	2025-2027	Acceptance of initial performance
O&M Phase	30 years	2025-2055	End of the term of the Project Agreement

## The ESAP RFQ Objectives and Deliverables guided our Strategy Pursuit Plan and Partnership Agreements



### ● RFQ Requirements included

- RFQ Evaluation Table requested Comparability and Capability of DES projects
- Construction Team + O&M Team would be evaluated individually
- Key Project References (comparable criteria)
- Key Individuals, relevant expertise and specific project references
- Risk comprehension and allocation for the project
- Technical and Financial Capability and Experience (Team Partnering)
- Demonstrative evidence and skills of proven DES experience within all Project Phases through a Project Agreement
- Signing one single Project Agreement which includes all Project Phases and necessary requirements



### ● Innovate Energy & ENGIE's RFQ Strategy:

- Leverage global, innovative expertise & DES Project references with use of local resources and a proven track record of successful completed projects within the Ottawa Region (+250 Projects, 15B\$ over 10 years.)
- Promote a relevant approach to developing a successful long-term partnership while attaining projected KPIs

## The ESAP RFQ Objectives and Deliverables guided our Strategy Pursuit Plan and Partnership Agreements

ENGIE's (O&M partner) responsibilities include:

- Deliver heating and cooling to meet the peak load and annual energy usage requirements for the buildings served by the Existing Infrastructure
- Operate, maintain and rehabilitate the District Energy Infrastructure associated with providing heating & cooling thermal energy services to the buildings
- Meet or exceed the targeted GHG emissions reduction associated with providing heating and cooling services for the NCR buildings;

ENGIE RFQ Response leveraged:

- Key DES expertise led by our Paris ENGIE Team (Olivier Racle)
- DES Global experience :
  - Convert Steam to LTHW, Carbon Reduction & Operational Strategies, Life-Cycle Approach, Renewable Energy Sources, and Digital Solutions
  - DES Modeling; Fuel Sources + Thermal Loads + Network + Dispatch ensuring we can attain projected KPIs; DES efficiency + GHG Targets.
  - References;
    - Stratford City & Olympic Park Energy Centre (East London)
    - Paris CPCU (1927) & CLIMESPACE
    - Ohio State University (+3B\$, 50 yr. Contract. ENGIE is Prime)
    - Nantes Métropole (DES Start Date = 2012)



## The ESAP RFQ Objectives and Deliverables guided our Strategy Pursuit Plan and Partnership Agreements



- Innovate Energy Team made the RFQ Short List
- ESAP Project became bigger than any individual Innovate Partner or individual.
  - We acted as one entity with one common objective; gain the confidence of the ESAP Team and win this 35 Year Partnership Agreement. Respect among Team members has consistently been maintained and became paramount to our overall success.
- RFQ Phase; many weekly in person meetings and conference calls
- RFP Phase; an arduous process despite our successful P3 experience
  - ESAP RFP contained:
    - Project Agreement (several versions & numerous pages)
    - RFP details and 33 Schedules
      - Schedule 9 Output Specification, Schedule 11 Environmental Obligations, Schedule 17 Payment Mechanism
    - Financial Requirements for Design Build & Construction Team + O&M for Existing and Modernized Phases.

## RFP Response Obligated Pursuit Team to partake many internal and Partnership Meetings to address all aspects of the ESAP RFP

- Legal Team developed, negotiated and approved 20 Agreements (O&M Agreement to Consortium Agreement)
- Technical Team developed and negotiated designs, costs, risks, schedules to satisfy DES Design, implementation and O&M requirements including Life-Cycle projections
  - Agreed upon DES efficiency & GHG targets enabled to conclude all technical aspects
- Financial Team included: Lenders Agreement & Financial Package requirements
- ENGIE Internal Meetings included
  - Risk Assessment
  - Joint Technical reviews, including DES Modeling led by Paris
  - Project's Life-Cycle Costs based upon a 35-year period
    - Staffing Requirements
    - Operational Plans for Existing & Modernized Phases
    - Maintenance Plans
    - Life-cycle & replacement equipment & related costs
    - Approvals at all levels
  - Average of 30 Meetings a week (long workdays for Global teams)

Risks and Responsibilities	Risks and responsibilities principally assigned to:	
	Private Partner	Canada
Cost overruns	√	
Delays	√	
Relocation of public utility infrastructure	√	
Contaminated soil - known conditions or resulting from construction and O&M activities for which the Private Partner is responsible	√	
Contaminated soil - unknown conditions	√	√
Geotechnical risks - known conditions	√	
Geotechnical risks - unknown conditions	√	√
Testing & commissioning	√	
<b>Modernized National Capital DES Operational Term</b>		
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	√	
<b>Finance</b>		
Financing during Design and Construction Work Period and Validation Period	√	
Inflation risk during Design and Construction Work Period	√	
Financing of any future Modernized National Capital DES expansion		√
Inflation risk during Modernized National Capital DES Operational Period		√
<b>Expansion</b>		
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	√	
<b>Customer services</b>		
Meter reading	√	
Customer billing and payment management		√
Help Desk services: emergencies, clients' requests linked with the National Capital DES	√	

## RFP Response included the following Operating Plans to be designed, developed and elaborated upon:

Rated Criterion	Section of this Technical Proposal	Relevant Project Agreement Schedules
<b>R1: Overall Management Approach</b>		
Health and Safety Plan	Tab 3.2.4	Schedule 9, 11, & 27
Communications Plan	Tab 3.2.5	Schedule 9, 15, & 27
Emergency Response Plan	Tab 3.2.6	Schedule 9
Environmental Management and Regulatory Compliance Plan	Tab 3.2.7	Schedule 9 & 11
Security Management Plan	Tab 3.2.8	Schedule 9 & 32
Incident Logging Centre Plan	Tab 3.2.9	Schedule 9
Transition Period Plan	Tab 3.2.2	Schedule 2, 9, 18, & 32
Utility Location Plan	Tab 3.2.10	Schedule 2 & 9
<b>R2. Quality Management Plan</b>		
Quality Management Plan	Tab 3.2.3	Schedule 6 & 27
<b>R3. Existing National Capital DES O&amp;M</b>		
O&M Plan	Tab 3.3.1	Schedule 9 & 18
Organization Chart	Tab 3.3.2	Schedule 9 & 27
Fuel and Electricity Plan	Tab 3.3.4	Schedule 9 & 18
Asset Management Plan	Tab 3.3.5	Schedule 9 & 18
<b>R4. Design Approach</b>		
Design Plan	Tab 3.4.1	Schedule 2, 5A, 9, 10
Design Activities Organization Chart	Tab 3.4.2	Schedule 9 & 27
Schematic Design Package for each District Energy System Network (Cliff Pack-age, Tunney's Pasture Package, NPB Package and Confederation Heights Package)	Tab 3.4.3.2	Schedule 9

ENGIE leveraged its Paris, London, Houston, Montreal and other Global Teams to design and develop the required ESAP Responses during the RFQ & RFP Phases.

Develop all Operating Plans, such as Asset Management, Communications & Operational Plans

Date	Location	Meeting Event	Objective	Details
August 7th	WSP	IA Design Meetings	Design weekly meeting	
August 13th	Confed	Work Stream CMMS	CMMS Design; Stage 1 - towards Design & Implementation	Half day focus event on CMMS with PSPC Manager - Ralph
August 13th	Confed	Environmental WG	Full day focus event on IT (TPP & Schedule 32)	PCPS & ENGIE IT & OT Teams meet to discuss Digital Solution Deliverables. (1) Final assessment Stage (2 is Design, 3 Present & 4 is Implement)
August 13th	Confed	Aesthetics and NCC Working Group	Full day focus event on IT (TPP & Schedule 32)	PCPS & ENGIE IT & OT Teams meet to discuss Digital Solution Deliverables. (1) Final assessment Stage (2 is Design, 3 Present & 4 is Implement)
August 13th	WSP	IA Design Meetings	Design weekly meeting	
August 14th (15:30)	B&M	Innovate Energy: Pre Controls Meeting	Digital Solution	Ensure Controls & equipment selection can be easily integrated into our Smart O&M Digital solution
August 15th	Confed	Lands WG	Full day focus event on IT (TPP & Schedule 32)	PC So De
August 15th	Confed	Building Conversion WG	Full day focus event on IT (TPP & Schedule 32)	PC So De
August 20th PM	PCL Offices	Operations Management Committee	Monthly (1st)	PC M
August 20th AM	Confed	Work Stream: PLAA Sub Contracts, Maintenance Contracts or ...?	PLAA - Plant Sub Contractor provider, Retain or NOT	PC Co
August 21st	WSP	IA Design Meetings	Design weekly meeting	
August 21st	WSP	Submit Quality Plans	Transition WG - PLANS	EN
August 22nd	DELTA HOTEL	ENGIE Town Hall (PSPC)	Transition WG - Prelim Staffing	EN
August 22nd	NPB	ENGIE Town Hall (BGIS)	Transition WG - Prelim Staffing	EN
August 27th AM	Confed	Work Stream- Prelim Staffing	ESAP Plants - Staffing & COMPLIANCE (PSPC Plants)	Pl, (A)
August 27th PM	B&M	Controls Meeting, invited by Charles L. & Tony D	Full day focus event on IT (TPP & Schedule 32)	En Int
August 27th AM	DND	Transition WG - Site Visit	(1) Review of Transition Plan. (2) Assess Deliverables Scope	Se sw Pl, PC So De Pl, Pl, En
August 29th?	PCL	General Partnership Committee Meeting	Full day focus event on IT (TPP & Schedule 32)	PC So De
August 28th	NPB?	Work Stream- Prelim Staffing	ESAP Plants - Staffing & COMPLIANCE (BGIS Plants)	Pl, Pl, En
August 28th	WSP	IA Design Meetings	Design weekly meeting	
August ?	B&M or WSP	Innovate Energy: Metering Meeting	Digital Solution	En ou

## COMMITTEES & WORKING GROUPS

ESAP Participants: Committee & Work Groups							
Item	EVENT	Frequency	Participants	ENGIE	PCL	B&M	W&P
1	General Partnership Committee	Monthly	Tomasz Smarzyk-Sowa (Chairperson), Miguel Martin, Chris Sullivan and Robert Rowe	Joseph Marrs	Tony Cook	Charles Leonard	D
2	Design and Construction Work Committee	Monthly	Robert Rowe (Chairperson), Miguel Martin, Chris Sullivan	John Samulack	Dave Coyle	Tony Dolan	D
3	Operations Management Committee	Monthly	John Shannon (Chairperson), Miguel Martin, Chris Sullivan	Thomas Catherineood & Joseph Marrs			D
<b>Working Groups</b>							
4	Design and Construction Working Group	min Monthly	Chris Micallef (Authority Group Lead), Miguel Martin, Robert Rowe, John Shannon, Doug Brown, Afif Suhail, Jim Manson, design managers. Others as required.	John Samulack, Olivier Racle Team (Olivier Racle, Ines Devautour)	Dave Coyle	Charles & Tony Dolan	Matt Anson
5	Operations and Maintenance Working Group	min Monthly	John Shannon (Authority Group Lead), Miguel Martin, Robert Rowe, Doug Brown and Jim Manson (FVE). Others as required.	Joseph Marrs (Transition Mgr), Tom Catherineood (O&M Manager), Remi Blackburn (Digital Director), Marie Samaja (HR VP)			
6	Transition Working Group	min Monthly	Brian Kendall (Authority Group Lead), John Shannon, Ralph Greenough and Doug Brown. Others as required.	Joseph Marrs & John Samulack	Tony C?		
7	Lands Working Group	min Monthly	Afif Suhail (Authority Group Lead), John Shannon, Justin Smith, David Wylie, Susan Cook. Others as required.	John Samulack		Tony Dolan	
8	Environmental Working Group	min Monthly	Conor Amos (Authority Group Lead), Afif Suhail and Design Manager (TBD). Others as required.	Qlyna Fallon and John Samulack		Tony Dolan	Matt
9	Aesthetics and NCC Working Group (Tunney's and Clift, NPB pumphouse)	min Monthly	Donald Grant (Authority Group Lead), Doug Brown, Afif Suhail, Design Manager (TBD) and consultants as required.	Joseph Marrs & Marie-Claude Cabana			
10	Security Working Group	min Monthly	Afif Suhail (Authority Group Lead), John Shannon, CISD and Security Team as required.	Caroline Paquette (CSO), Jean-Francois Maran		Tony Dolan	
11	Communications Working Group	min Monthly	Donald Grant (Authority Group Lead), Doug Brown. Others as required.	Marie-Claude Cabana & Joseph Marrs	Tony C?		
12	Building Conversion Working Group	min Monthly	Alexstar Day (Authority Group Lead), UBCP Team Member (s) (TBD), Bryn Elliot (FVE), Doug Brown and Afif Suhail.	John Samulack		Tony Dolan	
	ENGIE, Other Working Groups ?						

RFQ to RFP to Transition Phase, we became Masters at creating Roadmaps to attain the “End in Mind”; Start Date April 1<sup>st</sup> 2020 during the Covid Pandemic Challenge.

Intensity, passion and collaboration was an amazing and thrilling experience!

# Conclusion

## ENGIE's Journey with Innovate Energy and ESAP Team

### Comparable DES Experience includes :

- Manage +400 DES Contracts Globally, implicated from Design to Operation Phase and leveraging expertise & Project References
- Numerous DES Sites are committed with the Carbon Transition towards low Carbon fuels & seeking Carbon Reduction Strategies
- 4<sup>th</sup> generation DES Designs includes Integrated Digital Solutions, Renewable Energy, LTHW & Low Carbon Fuel Sources + Operational Best Practices. Our Strategy was to leverage such expertise including River Water Cooling in order to attain ESAP's KPIs
- Experience with Long Term Contract Development.
- DES Modeling leveraged NEMO to validate KPIs (Efficiencies & GHG Targets)
- ENGIE's goal is to continue pioneering the Energy Transition, aligned with ESAP's Sustainability Goals
- ENGIE Paris DES Team funneled comparable Global expertise onto the ESAP Project to manage Risk and projected O&M costs.

### Compelling Events:

- RFQ Kick Off, the Global race was on.
- Translating ESAP Challenges and Needs into Pursuit Strategies. Develop and validate Combined Value Propositions with Partners and ESAP .
- Collaborate with Partners and Act as One Entity, at the executive level and within the local Offices; develop **Trust & Respect** along the Journey. No Egos were permitted.
- Leverage ENGIE's References and Approach, similar to ESAP expectations (Performance Based Contracts).



[engie.com](http://engie.com)

**Tomasz Smetny-Sowa**  
**Energy Services**  
**Acquisition Program**  
**tomasz.smetny-**  
**sowa@tpsgc-**  
**pwgsc.gc.ca**



**Jim Manson**  
**FVB Energy**  
**[jmanson@fvbenergy.com](mailto:jmanson@fvbenergy.com)**



**Olivier Racle**  
**Engie**  
**Olivier.racle@engie.**  
**com**

