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Energy Services Acquisition Program (ESAP) in Ottawa – Case Study

Presentation Workshop 2: Governance Models and Success Strategies for Developing Thermal Grids

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Real Property Services Branch
Public Services and Procurement Canada



Public Services and
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Services publics et
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Canada

Program Overview

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

Goals & Objectives:

- Reduce Greenhouse Gas (GHG) emissions
- Reduce Costs
- Increase Safety & Reliability
- Leverage Private Sector's Innovation & Expertise



ESAP and Key Government Priorities

The ESAP modernization will help the Government of Canada to meet the following commitments:

- **Paris Agreement** committing Canada to reducing GHG emissions by 30% by 2030
- **Federal Sustainable Development Strategy and Greening Government** committing to lead by example by greening government operations and reducing emissions in government buildings and fleets by 40% by 2030 at the latest
- **Pan-Canadian Framework on Clean Growth and Climate Change** committing to move toward smart and sustainable buildings that use less energy and open the way for using renewable energy sources



The Value Proposition

- Modernization will achieve **significant GHG reductions**
- The DES will operate at a **lower cost** because the current system:
 - uses outdated steam-based technology that is inefficient and expensive to operate and maintain
 - has many components that are well past their expected life spans
 - is 25% less efficient than what industry can achieve
- It will generate savings estimated at \$750 million over 40 years
- It will also meet a government commitment to eliminate use of ozone-depleting substances.



Inside Cliff heating and cooling plant

The Plan

First stage – Modernization

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

Second stage – Deeper Greening and Expansion

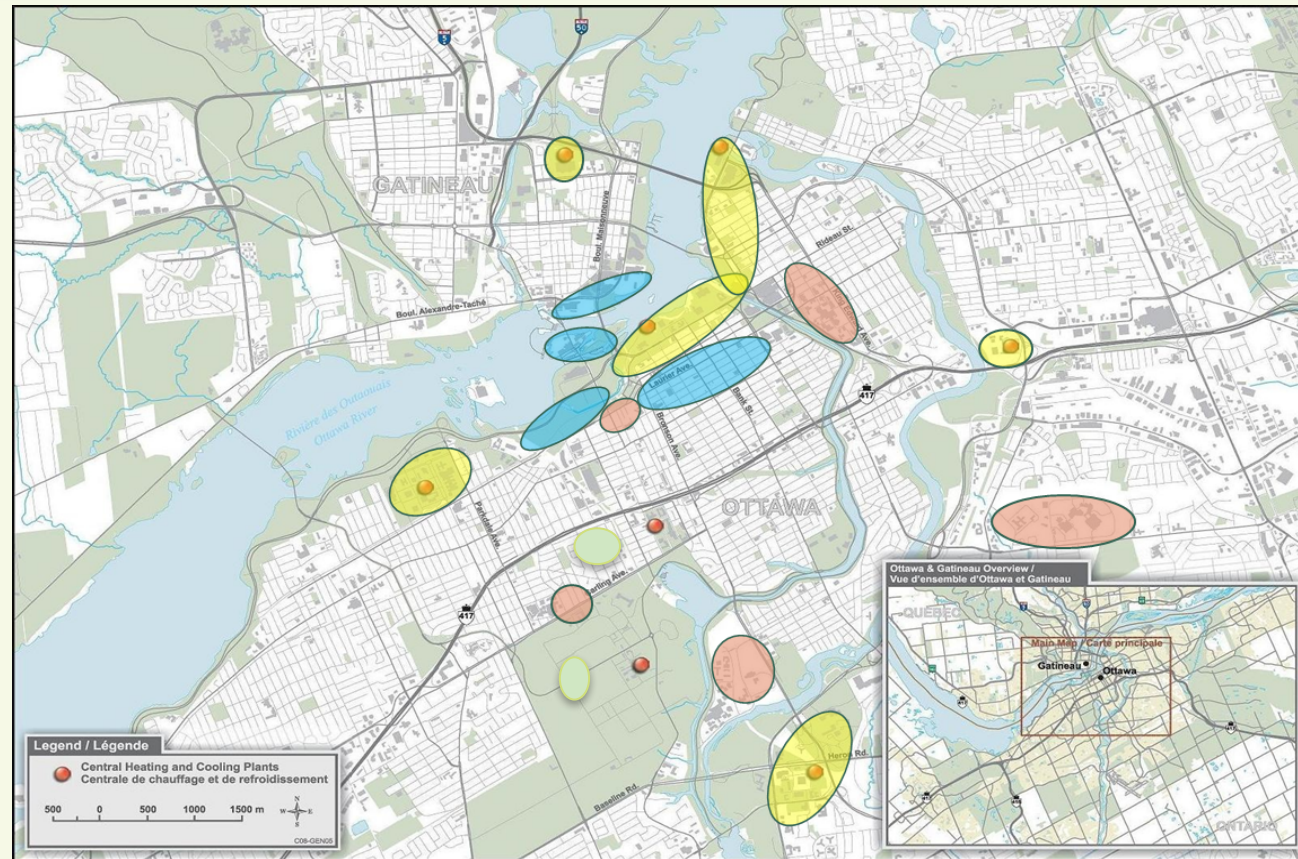
- Convert base load to carbon neutral fuels – achieve **low carbon government**
- Double the number of government buildings on the system
- Expand and share carbon neutral energy with non-GOC buildings in the community



Tunnels under Cliff heating and cooling plant

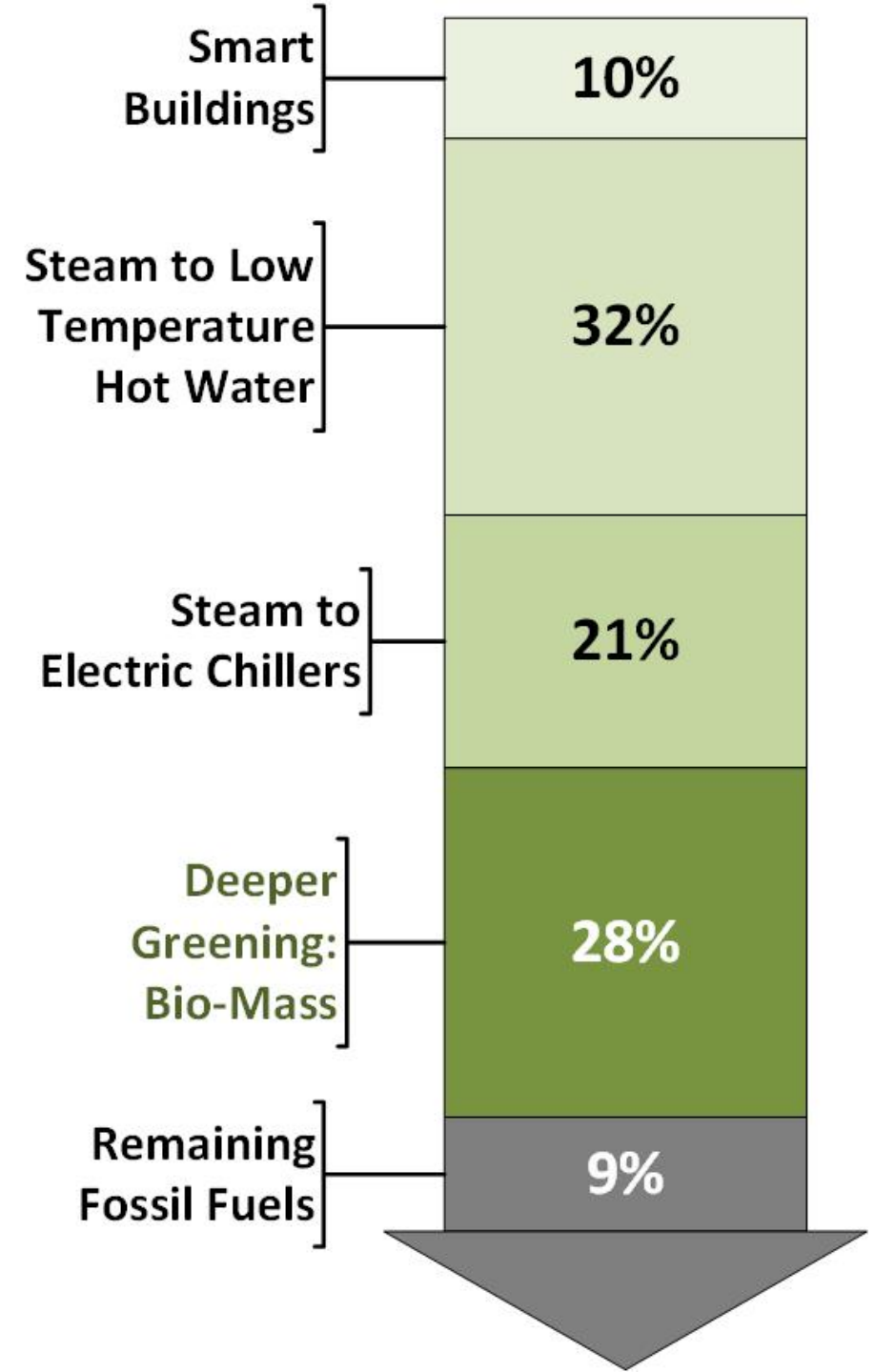
Our Network and Future Expansion

- Existing PWGSC DES locations
- Potential DES Growth and Expansion
- Other DES currently in operation (University of Ottawa, Carleton University, local hospitals)

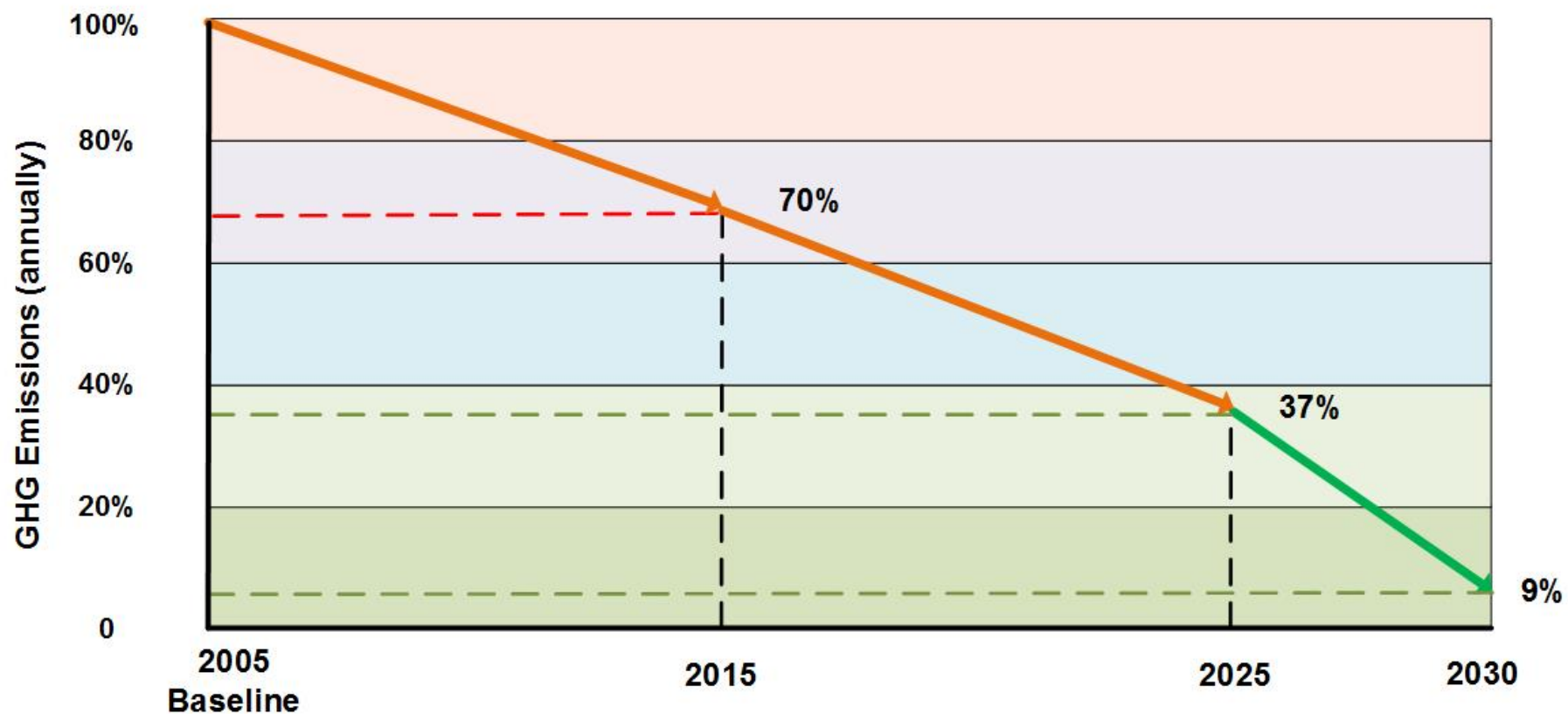


GHG Reduction Profile - All Actions

- By 2030 GHGs will be reduced to less than 10% of our 2005 baseline emissions if we implement stages 1 and 2
- The estimated reductions by category are listed here



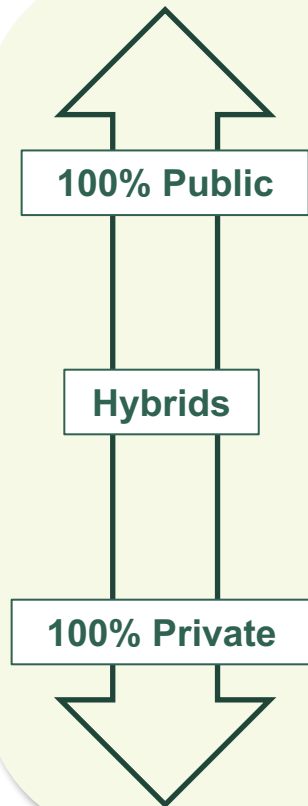
ESAP GHG Reductions 2005 to 2030



Selecting the Right Procurement Model

- DES projects are delivered worldwide through a variety of governance / business / procurement models and each one is developed within unique regulatory frameworks and business requirements
- In determining the procurement model, the sponsor needs to consider:
 - The preferred role of the sponsor in developing and operating the DES
 - The preferred risk allocation between the sponsor and the private sector
 - The regulatory framework
 - The contractual flexibility and sponsor's constraints
 - Existing infrastructure and diversity of client portfolio

Options for DES Procurement Models



Governance model	Ownership	Operated	Commercialization
Government owned	Public sector	Public sector In-house or outsource O&M	Public sector
Public Private JV	Co-ownership: public and private	Shared responsibilities	Co-owned entity
Split asset	Distribution: non-profit Plants: Private sector	Non profit company In-house or outsource O&M	Non profit company
P3 DBFOM	Public or private sector	Private sector	Public or private sector
Privately owned, Non-profit	Non profit company	In-house or outsource O&M	Non profit company
Privately owned	Private sector	Private sector	Private sector

Looking at DBFOM (Design, Build, Finance, Operate and Maintain)

- P3 contracts are comprehensive agreements with greater risk transfer to the private sector and typically include all phases of an asset:
 - Design and construction
 - Operations and maintenance
 - Financing
- P3s are fixed price performance based contracts, payments are made based on availability and alignment with technical and performance requirements



Looking at DBFOM (Design, Build, Finance, Operate and Maintain)

- The private capital at risk (project financing, debt and equity) provides additional due diligence and oversight on the project and anchors the risk transfer to the private sector
- In Canada, the public sector usually retains the ownership of the asset, however there are many DES P3s where ownership was transferred until the end of the contract term



Confederation Heights Plant

Benefits and Disadvantages of DBFOM for ESAP

Benefits

- The private sector assumes the risk (as long as the project does not change)
- Additional oversight from lenders
- Integration of O&M needs into design
- Cash up front

Disadvantages

- Higher cost of financing
- With any changes to the scope triggers negotiations to the contract and possibility that the risk reverts back to the Government of Canada

The ESAP Procurement Choices

- The delivery model will be one contract for energy modernization (Stage 1) – a DBfOM
 - It is a single P3 project agreement with a duration of 35+ years
 - **DB** = design build and this phase will take seven years
 - **f** = finance and only the design build phase will be financed
 - **OM** = operations and maintenance and it will go until 2055
- Two other important components are delivered outside of the P3
 - Smart Buildings implementation is a joint contract with another government entity - National Research Council (NRC)
 - Individual Building Conversion is a Design, Bid, Build (DBB) with contracts for each building

Exciting Models are an Inspiration for ESAP

Across the world we are seeing exciting new models for heating and cooling – ESAP will be a model for others once completed



*Amager Bakke incineration plant in Copenhagen,
Denmark*



*Exciting Public Architecture – Spittelau Waste
Incinerator, Vienna*

Efficient Installation Will Minimize Disruption

The installation of piping infrastructure is quick and efficient with public spaces affected for less than a week



Pre-insulated piping being installed



Rapid infrastructure installation in Copenhagen, Denmark

Thank You

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