1A PLANNING AND DEVELOPMENT
SHERIDAN COLLEGE GOES DANISH
IMPLEMENTING THEIR DISTRICT ENERGY
AGENDA

1. Background – up till now
2. District Energy on two campuses – current work
3. System optimisation and some advantages
4. A little bit on Standards
5. Questions?
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SUSTAINABILITY AT SHERIDAN
TRIPLE SUSTAINABILITY

Environment
• Better resource use (35→90% efficiency)

Economy
• Two revenue sources

Society
• Cheap “waste” heat → Lower energy cost
INTEGRATED ENERGY & CLIMATE MASTER PLAN (IECMP)

• Sheridan Integrated Energy & Climate Master Plan (IECMP) Taskforce
• A comprehensive technical, investment and savings plan
• Active participation of students and faculty
IEMP Framing Objectives

- Energy Efficiency Gain
  - At least 50% by 2030 below 2005 baseline
- Greenhouse gas emissions reduction
  - At least 60% by 2030
- Internal Rate of Return
  - At least 7% on recommended investment

- Ensure energy supply reliability
- Create campus-wide energy culture
- Be a platform for new energy technologies
- Offer competitive energy and climate curricula
- National and Community Role Model
PROJECT PROCESS

Development & feasibility

Design & Engineering

Tendering & Procurement

Construction & Commissioning

O&M
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Challenge
Develop district energy for the two campuses – Davis & Trafalgar

What we do
Owners engineer. Advise college on planning, technical and economic matters. Design district energy system.

Effect
Raise energy efficiency. Lower costs. Future proof energy system.
DAVIS AND TRAFALGAR CAMPUS
WORK TO DATE AND IN PROGRESS
WHOLE SYSTEM APPROACH

• Hydraulic optimization analysis using proprietary software, SR2, for both Davis and Trafalgar campus
  • Heating for Davis Campus
  • Heating and cooling for Trafalgar Campus
• Study for location of Trafalgar Energy Centre
• High level review of Davis Energy Centre

• Detailed piping design - distribution
  • In ground, above ground, and in buildings
• Energy Centre design at Trafalgar
  • Hybrid dual location design utilizing a new location and existing buildings to house the energy plant
• Energy Transfer Station (ETS) specifications tailored to each building’s requirements
HYDRAULIC OPTIMIZATION

- Roughly 70% of investment is usually in the network
- Pressure ratings, design against surge, water hammer, cavitation and thermal fatigue
- System Rornet engineering tool
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Design Goals

• Low operating supply temperature for minimal heat/energy loss which in turn reduces operating costs

• Maximum delta T at energy transfer stations for maximum energy transfer, maximum value for pumping costs which in turn reduces operating costs

• Maximize pipe flow capacity to allow for smaller pipes which in turn reduces capital investment and heat losses
ENERGY TRANSFER STATION - ETS

- Each connection is hydraulically separate from the network
- Allows buildings to operate individually from the network
- Protects the network from building related issues
- EU ETS manufacturers coming to the Canadian market
- Each connection point is metered individually
SOME PICTURES FROM REAL LIFE IN CANADA
PREINSULATED PIPING ADVANTAGES

- Bending flexibility – easier installation around bends which reduces installation costs
- Insulation – retains heat/energy which reduces operating costs
- Leak alarm system – detects and locates leaks which reduces operating costs
  - For both heating and cooling pipes
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PIPING INSTALLATION - BEST OF BOTH CONTINENTS
CSA, ASME VS EN STANDARDS

O-Reg 220 (CSA B51, ASME B31.1, etc.)

- X-Ray not required
- Alignment to be within 2mm
- Hydrostatic pressure test to be 1.5 times the design pressure, held for 10 minutes, then reduced to design for leak test

EN 13941 – Design and installation of preinsulated bonded pipe systems for district heating

- X-Ray required on 10% of welds
- Alignment to be within 1mm
- Pressure test is not required, but weld leak tightness test of all welds is
THANK YOU

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