

Whistler Athletes' Village



Whistler Athletes' Village Low-Temperature District Energy-Sharing System

EXTRACTING CLEAN HEAT FROM SEWAGE EFFLUENT

District energy systems are normally designed to circulate high temperature water through their distribution loops, limiting their use and responsiveness.

The Whistler system is unique in that it uses low-temperature ambient heat, making it flexible enough to provide both heating and cooling for the Athletes' Village.

Using recovered sewer heat, it is one of the first closed-looped, heating and cooling district energy system in the world.

Its use of treated effluent advances the science of reducing greenhouse gas emissions by replacing natural gas with a previously wasted energy source.

Whistler DES Size and Performance

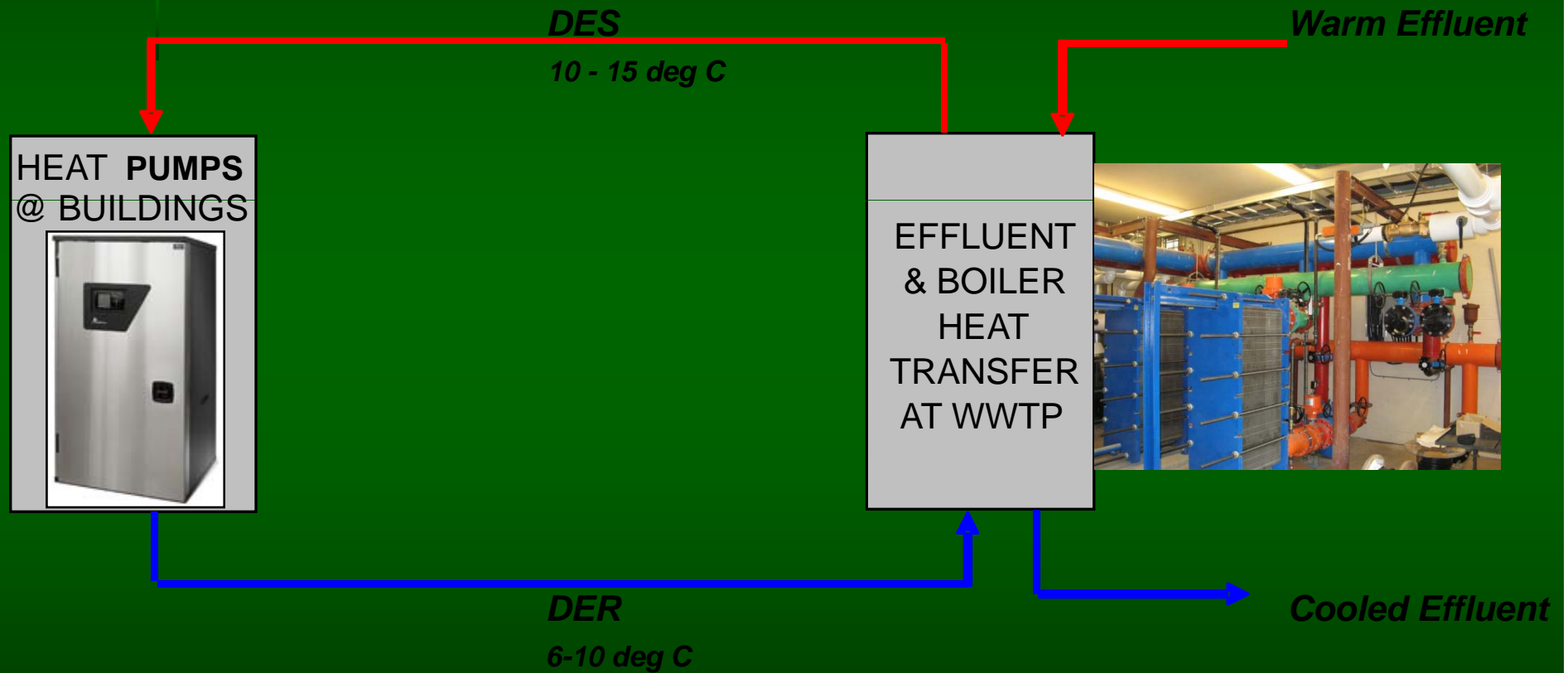
- Reduction in natural gas heating: 97%
- Tonnes of CO₂ saved annually: 1,500
- Ultimate population served: 2,200



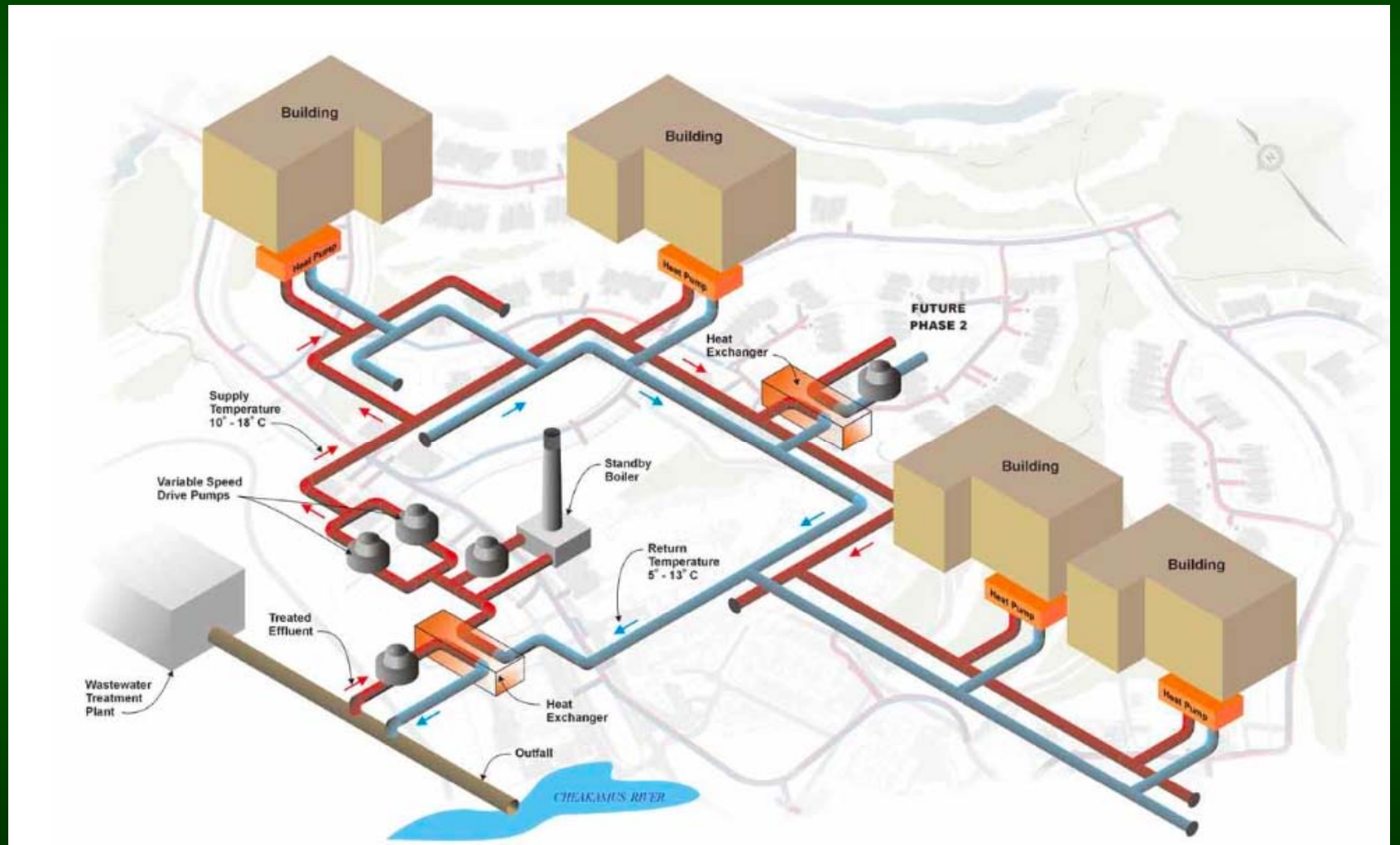
Whistler Athletes' Village - DES

- **Low temperature District Energy System (DES)**
- **Primary heat source: WWTP treated effluent**
- **Secondary heat source: natural gas boilers**
- **Load-side ETS: heat pumps & heat exchangers**
- **Heat sharing: MURBs/Institutional cooling – shed heat to supply loop**
- **Phase 1 (current): 300 units; Phase 2: 600 units**

WAV DES Design



DES System Schematic



Whistler Athletes' Village (or now, Cheakamus Crossing)



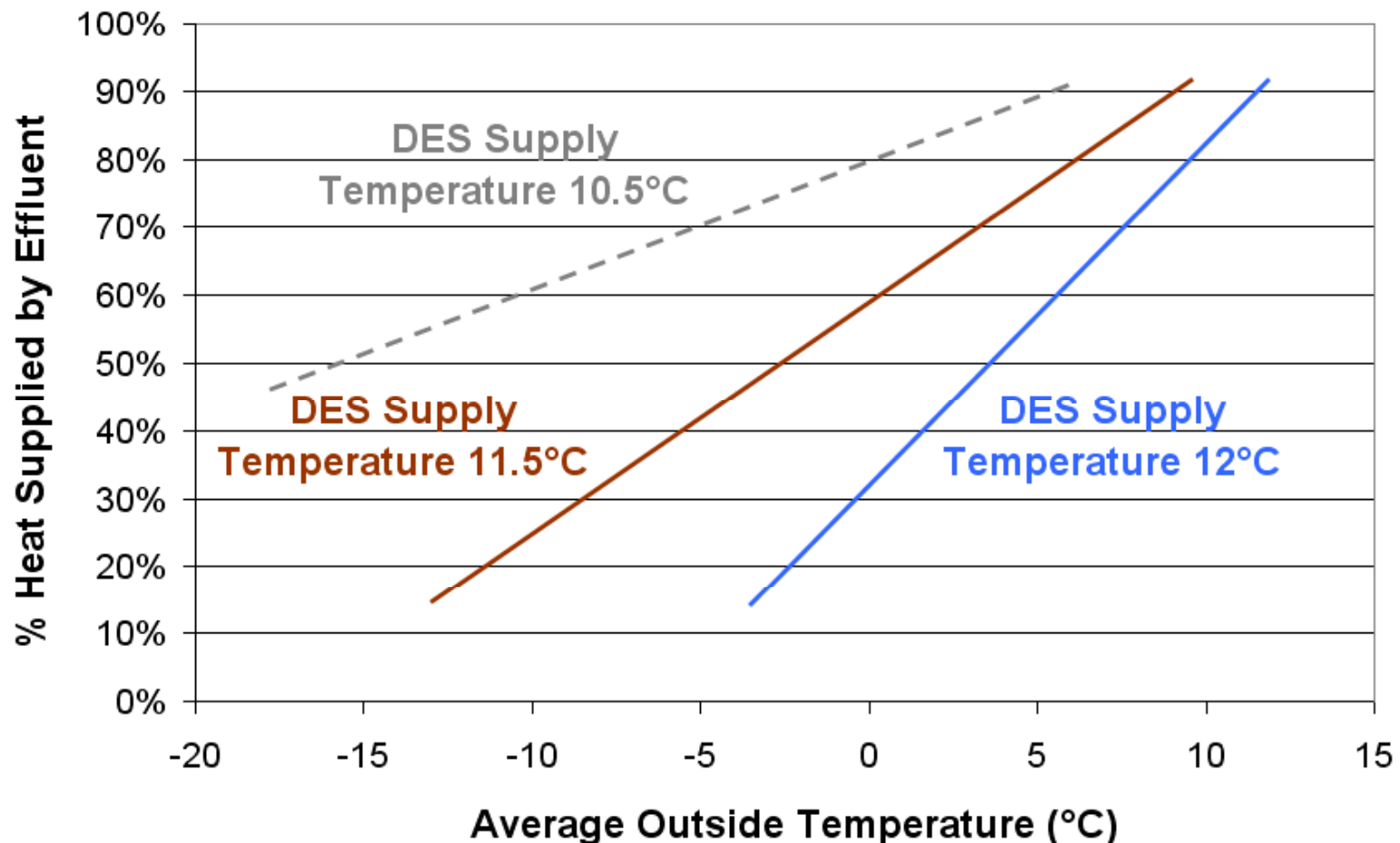
DES Effluent Heat Recovery System



WAV DES Design Parameters

- Flow rate: 1 to 4 m³/min (Phase 1)
- Supply Temperature: 10°C to 15°C
- Return Temperature: 6°C to 10°C

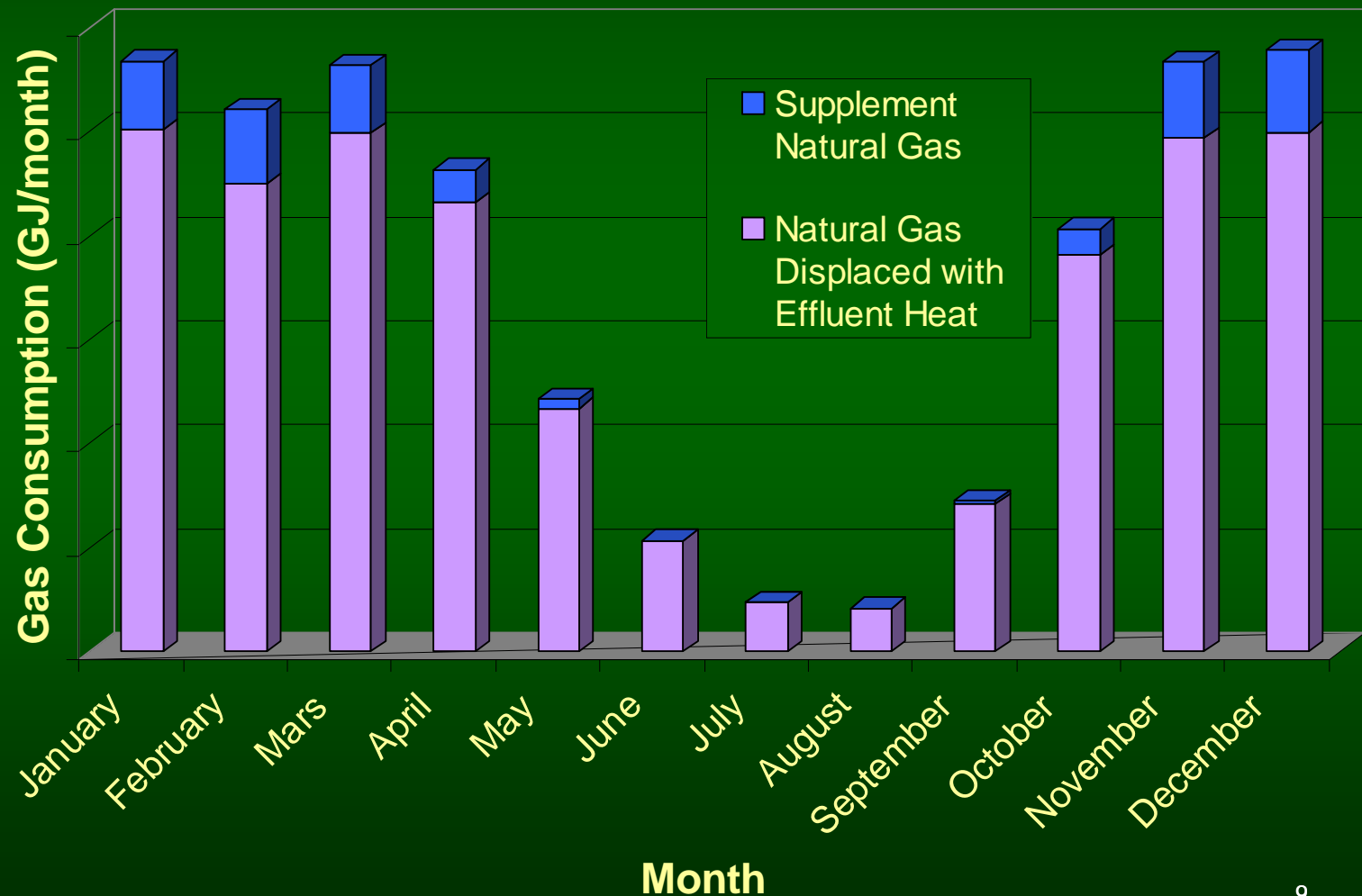
WAV DES Commissioning: Heat Supplied By Effluent



Notes - solid lines: operational results; dashed line: system design parameters.

WAV DES – Forecast Performance

10.5 deg C Loop Temperature



Notes - February 2006 was warmer than average.

Forecast Heating Energy Cost Savings – Development Phase 1

- 10.5°C DES Supply Temperature:
 - >90% displacement of natural gas
 - Annual saving of ~ \$300K from BAU (@2010 NG prices)
- 12°C DES Supply Temperature:
 - ~50% displacement of natural gas
 - Annual saving of ~ \$170K from BAU (@2010 NG prices)