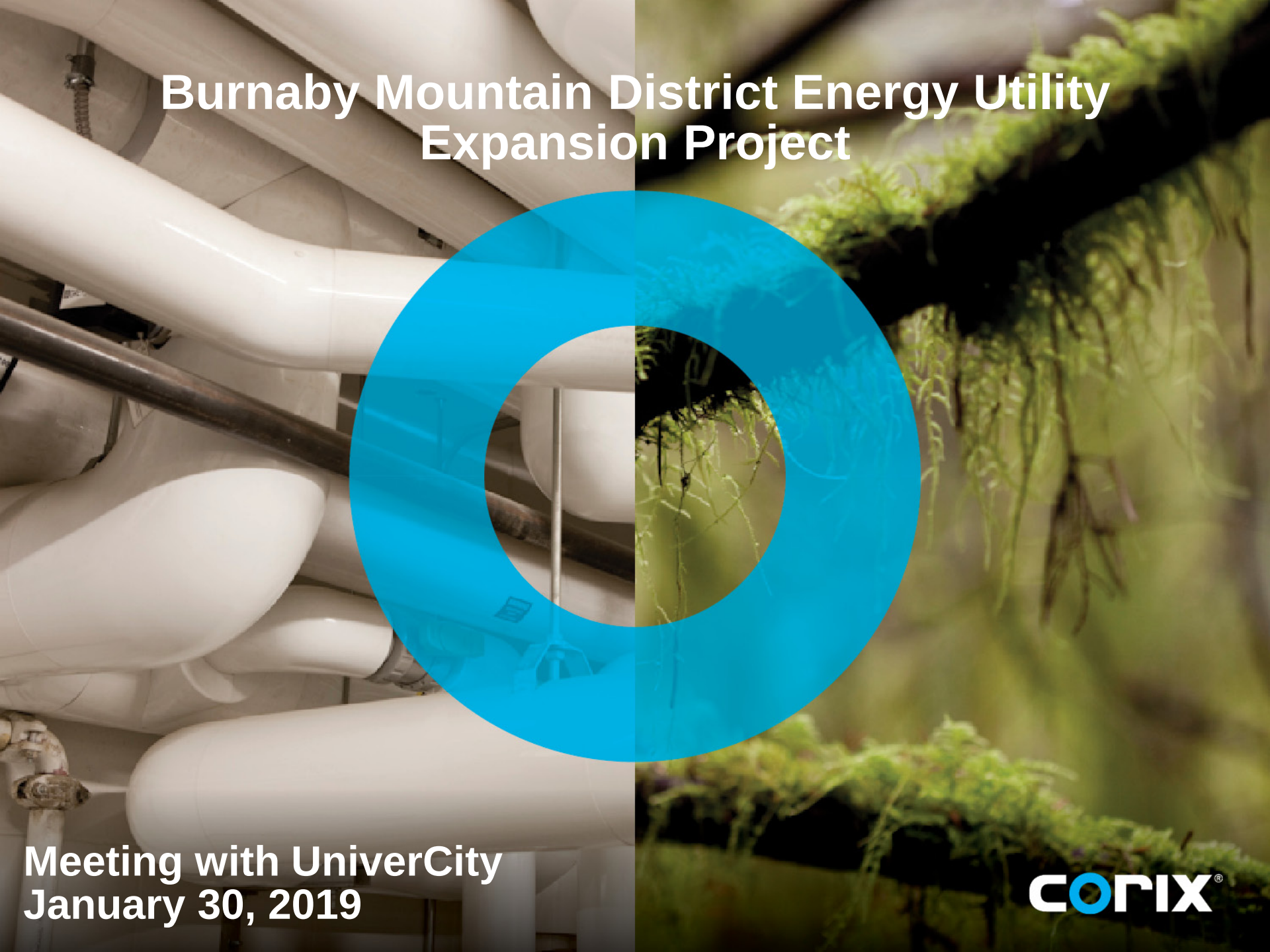
Burnaby Mountain District Energy Utility Expansion Project



Meeting with UniverCity
January 30, 2019

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Agenda

- Introductions
- Project Overview
- Project Impacts and Road Closures
- Project Timelines
- Questions and Answers

Burnaby Mountain DEU Overview

- The BMDEU is a regulated District Energy Utility (DEU) that currently provides energy for space heating and hot water to UniverCity.

- The Biomass Expansion Project provides:
  - Cost-effective, low carbon thermal energy to the SFU campus and UniverCity
  - An estimated **80% reduction in greenhouse gas emissions at SFU** when compared to fossil fuel and electricity use
  - 1.5 km expansion to existing network along Tower Rd and South Campus Rd
  - 23.5 MW Central Energy Plant (13.5 MW biomass + 10 MW Natural Gas)

Burnaby Mountain DEU Development

We are Here

- 2 interim central energy plants using NG (2.3 MW + 6.0 MW)
- 1.8 km of piping installed
- 10 buildings connected

Burnaby Mountain DEU

- Biomass based central energy plant - 13.5 MW
- 10 MW natural gas peaking and back-up for UniverCity
- 22 buildings and SFU Campus connected
- Over 5 km of piping installed

Project Benefits and Opportunities

Benefits

- 11,600 tonnes of CO_2 saved
- Use of clean wood waste sourced locally
- Increased efficiencies, economies of scale
- Possibility to integrate a low carbon electricity generation
- Price stability
- Independent third party oversight

Opportunities

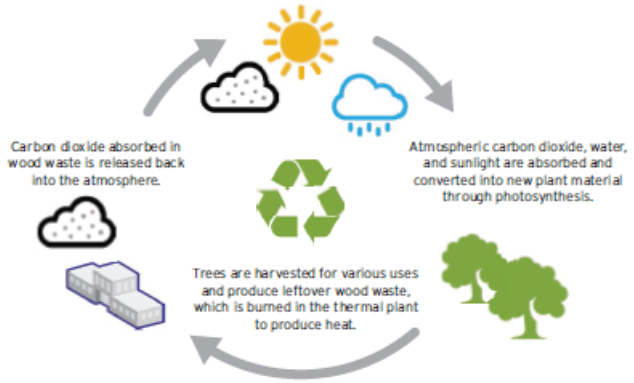
- Educational - synergy with SFU Energy Systems and Environmental Engineering Program
- Integration with the SFU stainability plan
- SFU environmental objectives

Environmental Considerations

Environment and Air Quality

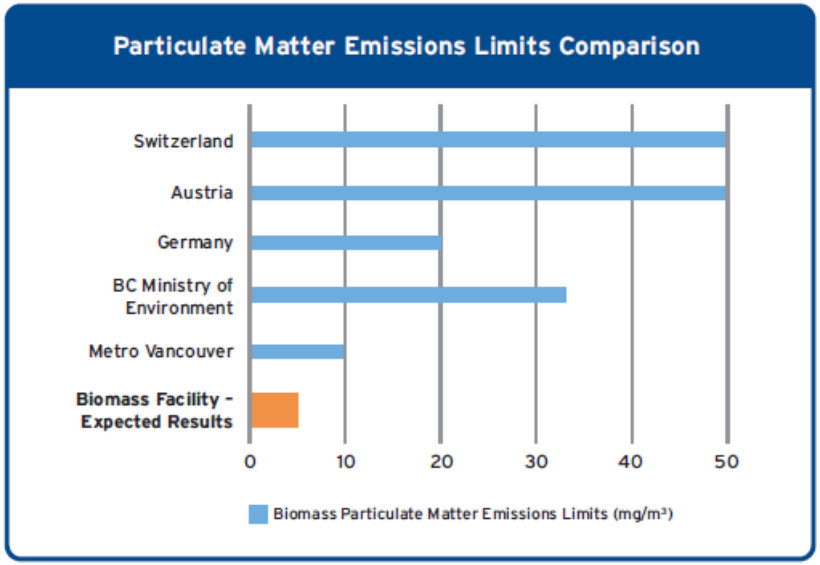
Once the project is fully implemented, the system will reduce an estimated 11,600 tonnes of CO_2 annually, representing an 80% reduction in greenhouse gas emissions when compared to fossil fuel and electricity use.

Using wood waste for energy has a positive impact on controlling climate change. While fossil fuel combustion takes carbon from underground and puts it into the atmosphere in the form of carbon dioxide (CO_2), which is the primary cause of climate change, biomass combustion recycles the carbon that was already in the natural carbon cycle, not adding any additional CO_2 to the atmosphere.



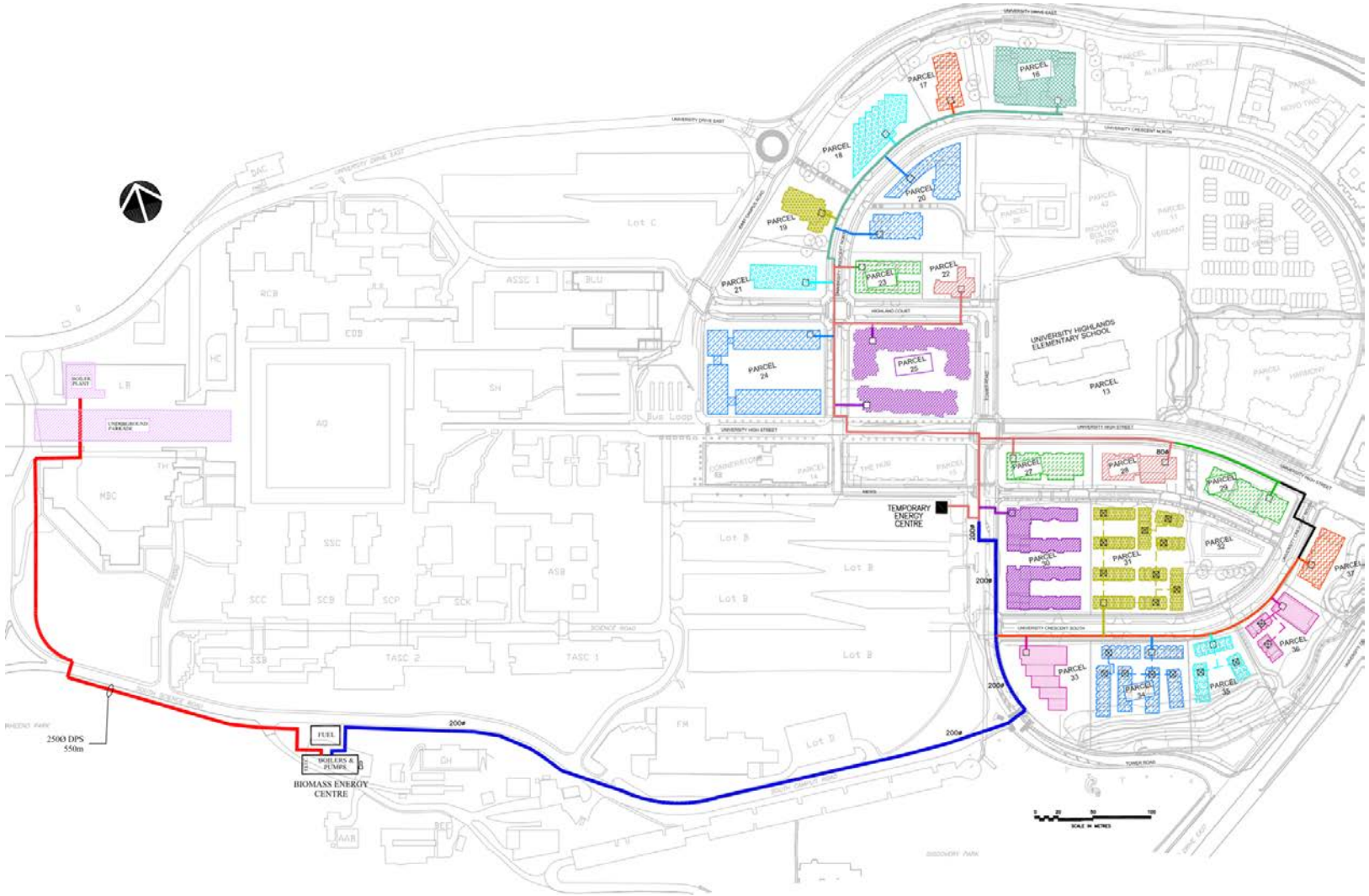
Metro Vancouver has set some of the most stringent limits for particulate matter emissions in the world.

Air emissions from the biomass facility will meet or exceed Metro Vancouver's bylaw requirements and will be continuously monitored.

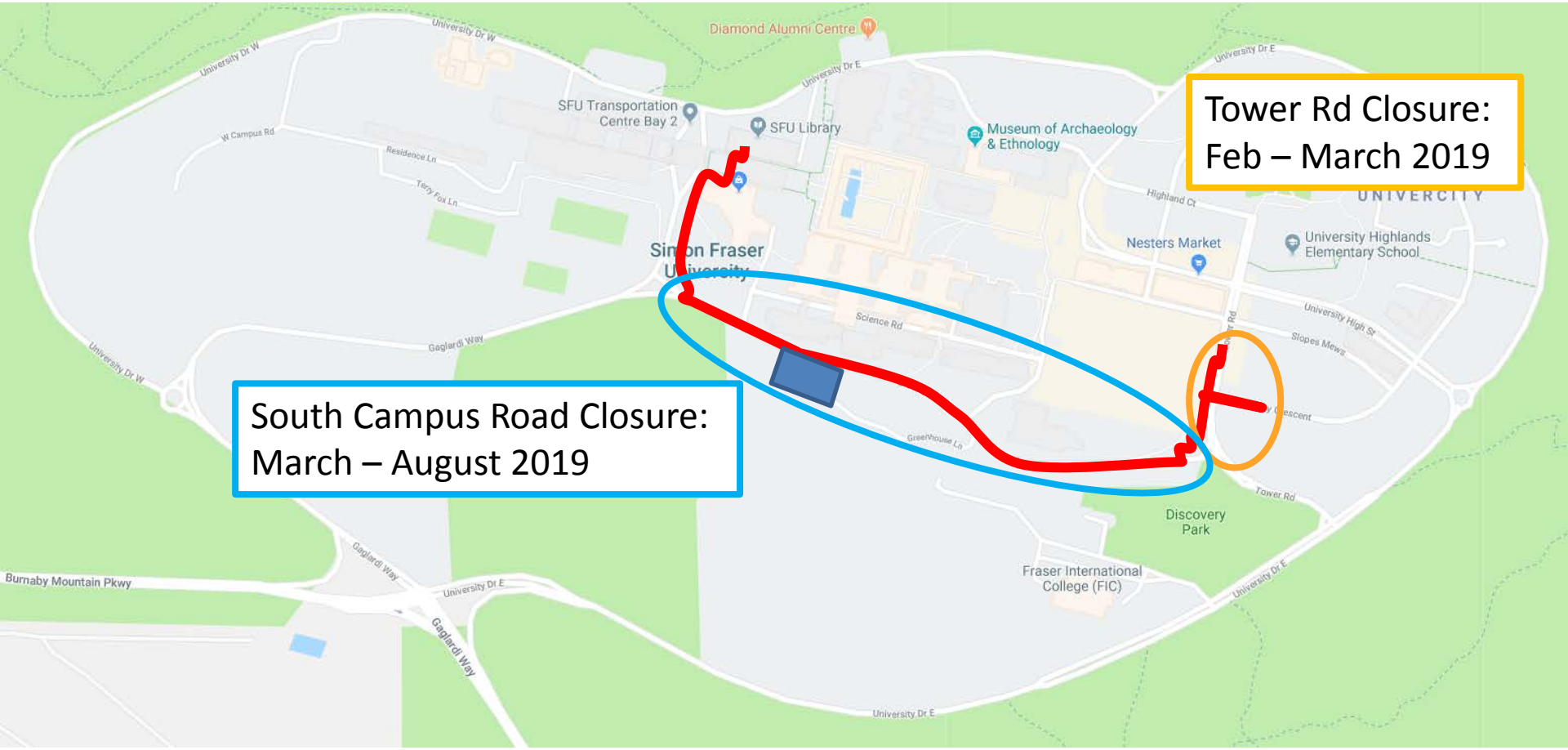


Source of Comparison Data: BC Ministry of Environment, 2008. Emissions from Wood-Fired Combustion Equipment: http://www2.gov.bc.ca/assets/gov/environment/waste-management/industrial-waste/industrial-waste/pulp-paper-wood/emissions_report_08.pdf

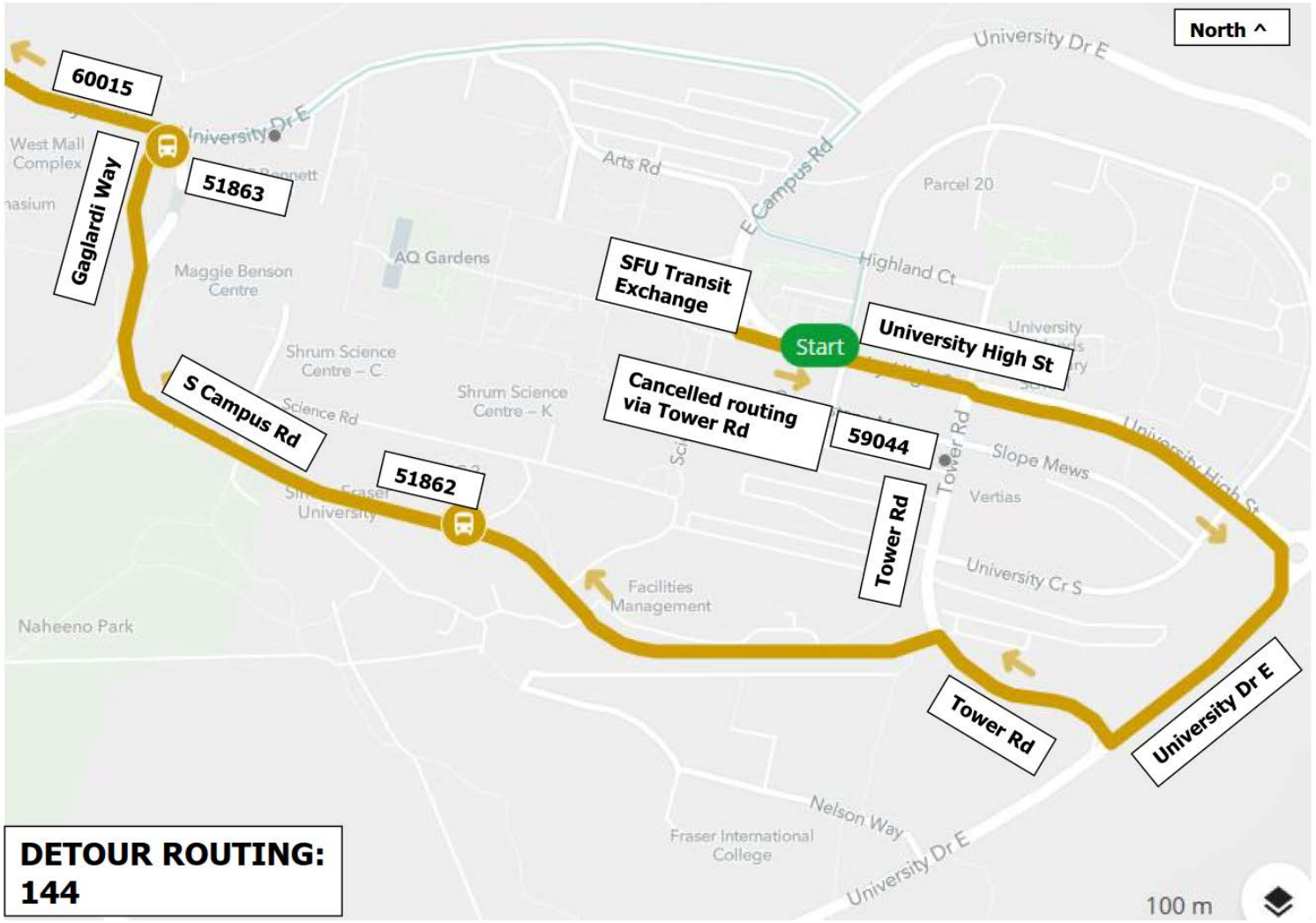
Distribution Network



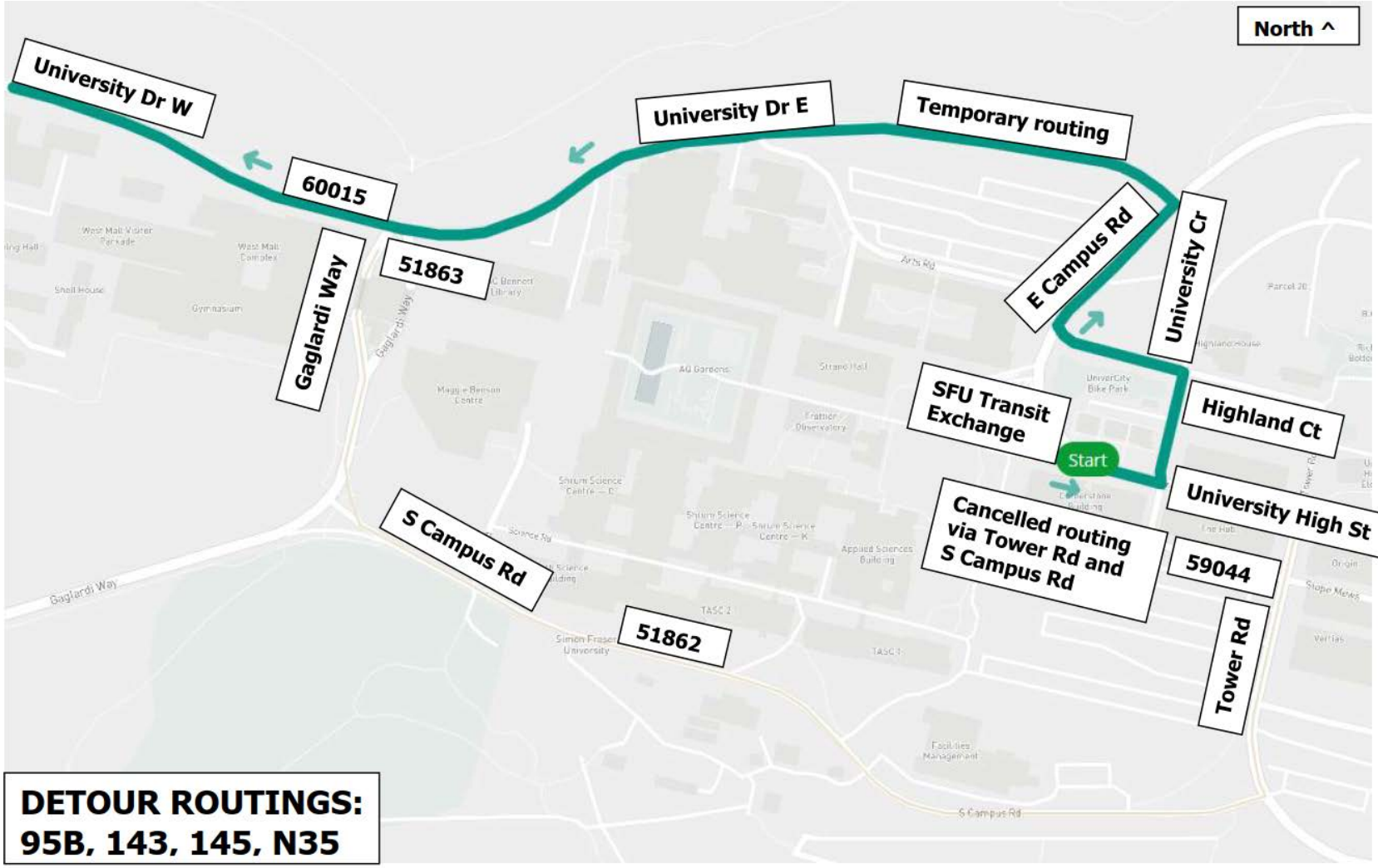
Distribution Network Extension



144 Bus Detour: February – April 2019

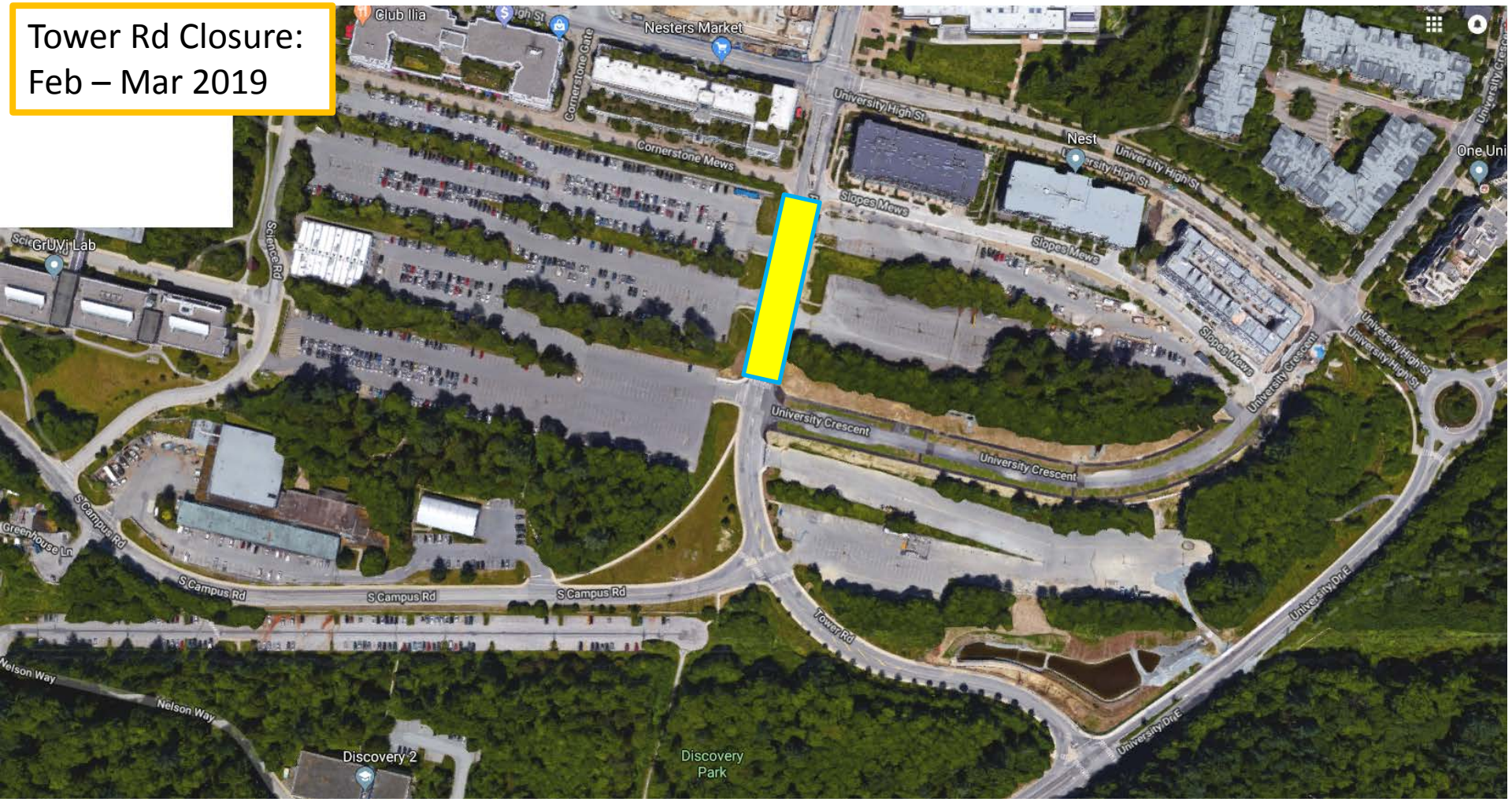


Bus Detours: February – August 2019



Tower Road Closure

Tower Rd Closure:
Feb – Mar 2019

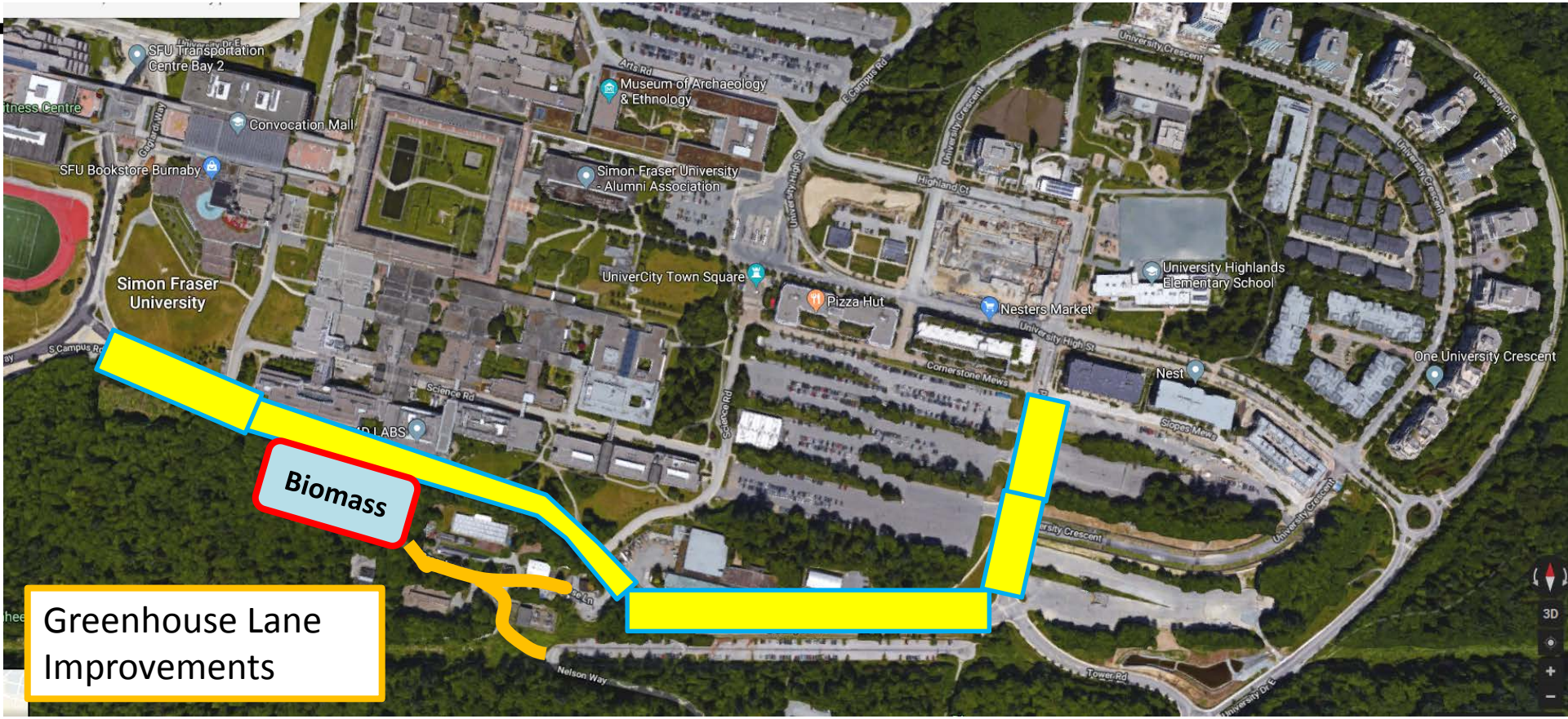


Tower Road Closure: Phase 1.1
Estimated 4 weeks, starting Feb. 4

Tower Road Closure: Phase 1.2
Estimated 1.5 weeks

Tower Road Closure: Phase 1.3
Estimated 2.5 weeks

South Campus Road Closure



Greenhouse Lane Permanent Intersection Closure: Feb. 4, 2019

Tower Rd Closure: Feb – March 2019

South Campus Road Closure: March – August 2019

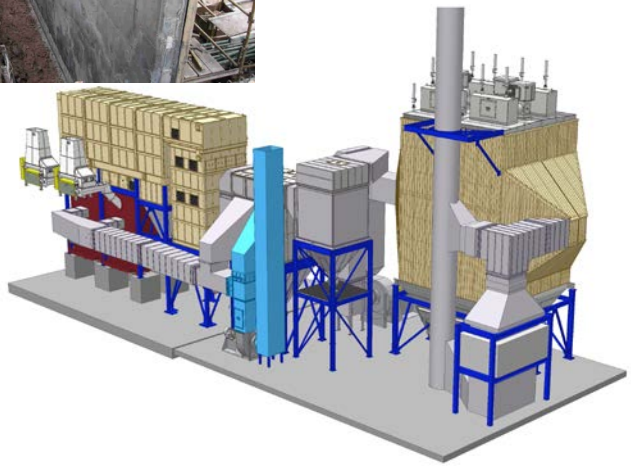
Timelines

February – April 2019

- Greenhouse Lane permanently closed at South Campus Road (West int.)
- Biomass Civil Works Start (Grading, Removals, Services)
- Tower Rd Construction

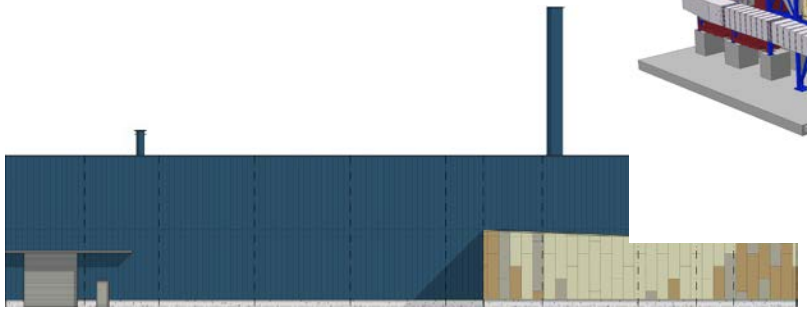
March – August 2019

- South Campus Road Construction
- Foundations and Retaining Wall Construction



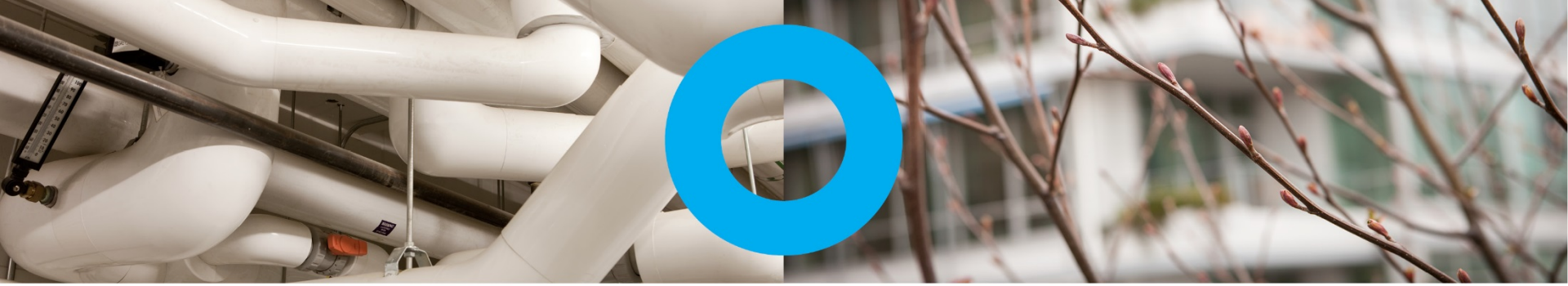
July 2019 – March 2020

- Install process equipment
- Building Installation
- Pour concrete floors
- Landscaping



Spring 2020

- Biomass Commissioning



Questions and Answers

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