

PROJECT:

CITY OF SHORELINE

TOPIC:

DISTRICT ENERGY OVERVIEW AND FEASIBILITY STUDY

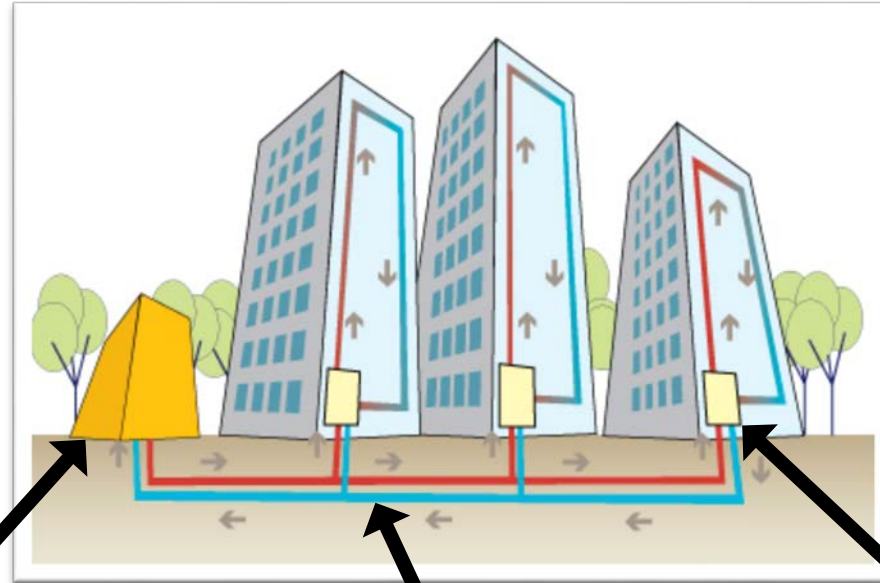
LOCATION:

SHORELINE, WA

DATE:

JULY 24, 2017

DISTRICT ENERGY



CENTRAL PLANT
Plant on roof of building



DISTRIBUTION PIPING
4 pipe system (heating & cooling)



BUILDING CONNECTION
Heat Exchanger

DISTRICT ENERGY



SOUTH FALSE CREEK
Vancouver, BC



DOCKSIDE GREEN
Victoria, BC



REGENT PARK
Toronto, ON



THE BREWERY BLOCKS
Portland, OR



THE ROUND
Beaverton, OR



Hartford Central School District
Hartford, NY

DISTRICT ENERGY



REGENT PARK
Toronto, ON

Mixed Use
Development
70 acres



DISTRICT ENERGY

COMMUNITY

1. INCREASED ENERGY EFFICIENCY
2. REDUCED GHG EMISSIONS
3. REDUCED COST OF ENERGY SERVICE
4. IMPROVED RESILIENCY AND RISK MITIGATION
5. PARTNERSHIP AND INVESTMENT OPPORTUNITY

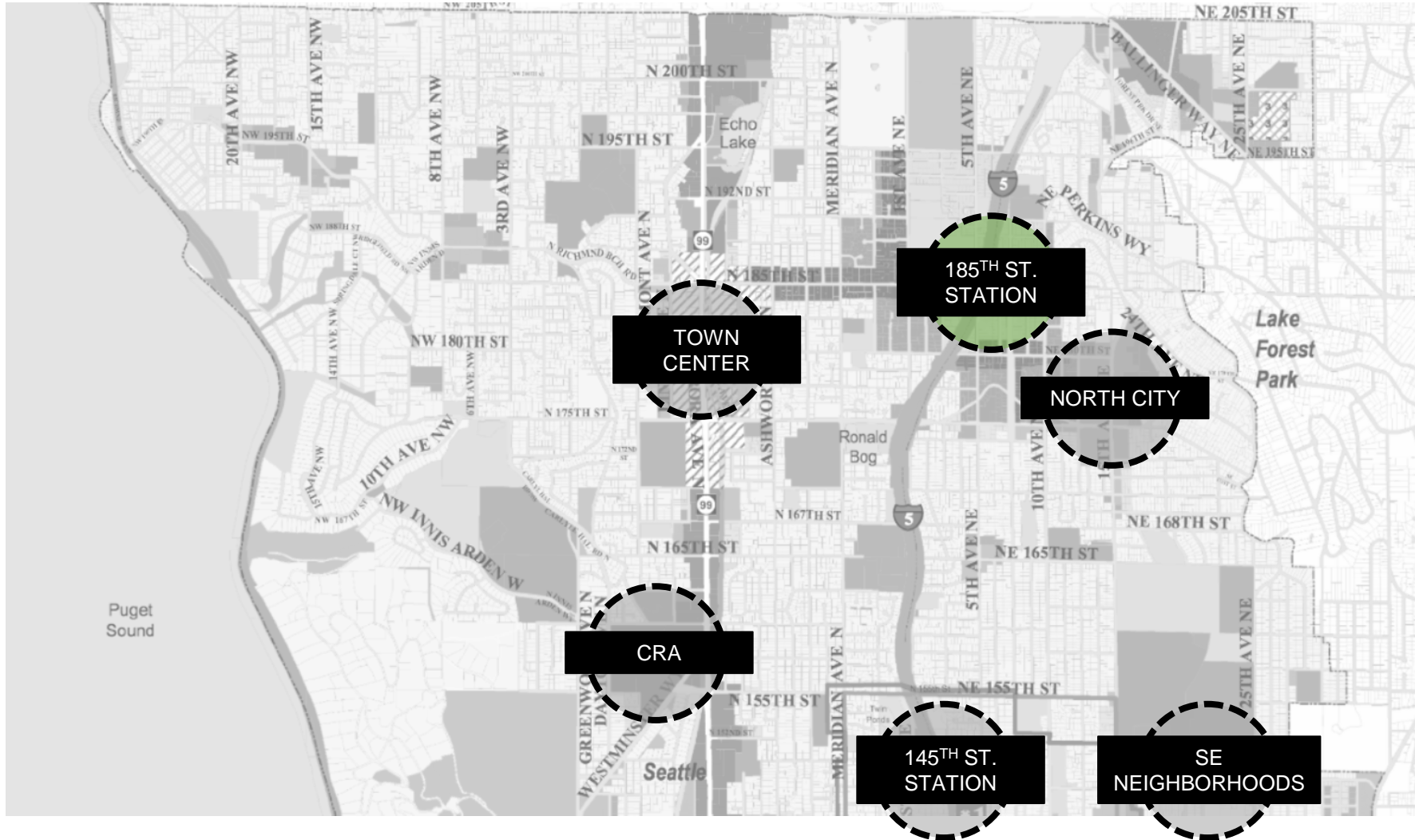
BUILDING

1. REDUCED ENERGY COSTS AND COST STABILITY
2. INCREASED COST EFFECTIVENESS
3. ENHANCED ENERGY EFFICIENCY AND GREENER ENERGY
4. REDUCED BUILDING O&M RESPONSIBILITY AND COST
5. FUTURE TECHNOLOGY BENEFITS

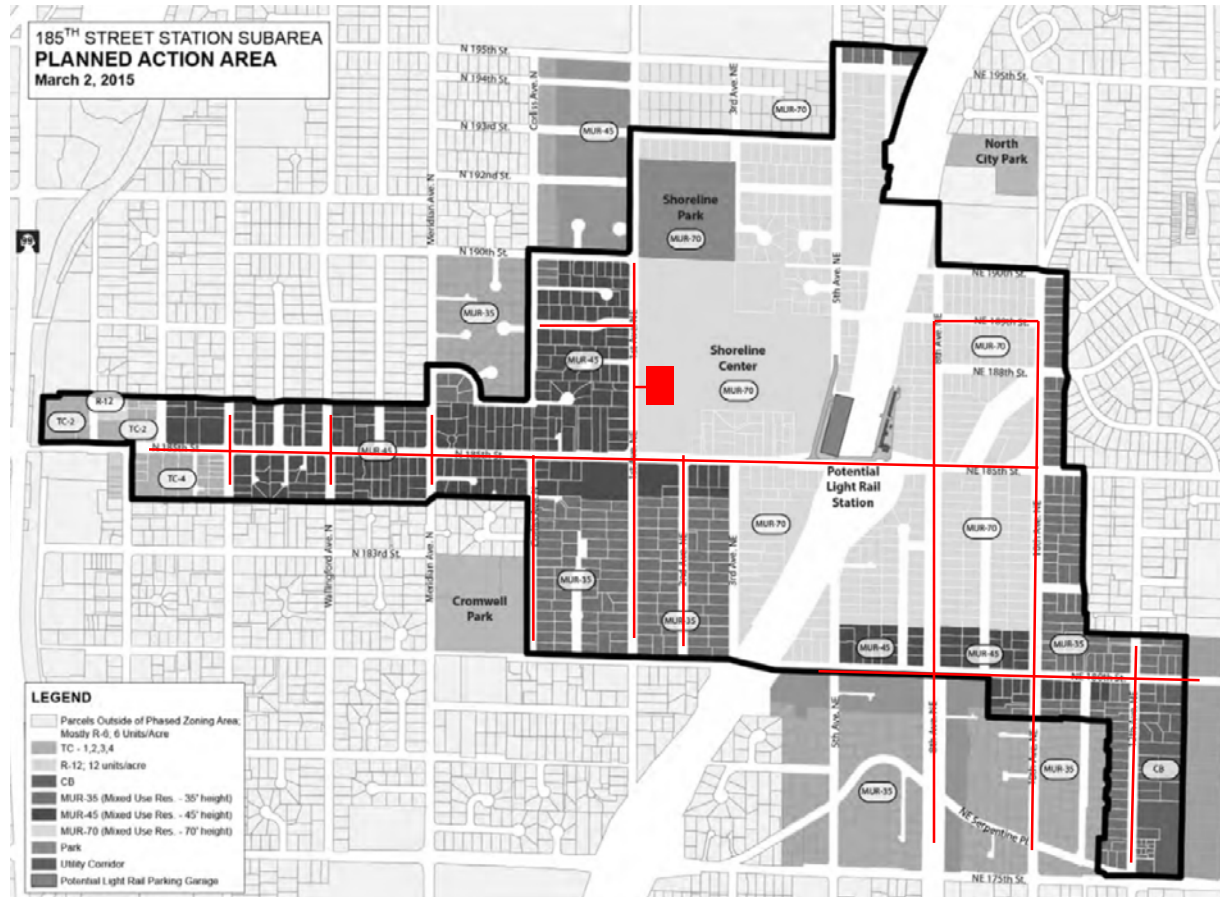
DETERMINING THE POTENTIAL VALUE OF DISTRICT ENERGY

1. SCALE – The ultimate scale of the system.
2. DENSITY AND LOAD MIX – The density and mix of loads (the higher density and greater use mix will typically results in greater ratio of benefits to costs).
3. DEVELOPMENT RATE AND PHASING – Adequate development demand to justify capital investments.
4. LOAD SECURITY – Ensuring load certainty through agreements, requirements and/or incentives for customers to connect and consume.


POTENTIAL SHORELINE DE




POTENTIAL SHORELINE DE




SYSTEM BOUNDARY

-  Likely district energy system boundary.

CENTRAL PLANT

-  Central generation of heating (boilers) and cooling (chillers)
- Boilers to be natural gas fired.
- Chillers to be electric.
- Footprint likely 10,000-20,000 SF (to confirm...).
- Central plant can be integrated into open space or buildings.

DISTRIBUTION SYSTEM

-  Traditional four pipe system.
- 2 pipes for heating (supply and return)
- 2 pipes for cooling (supply and return)



CENTRAL PLANT INTEGRATED INTO URBAN FABRIC

The Brewery Blocks (Portland, OR)

NOTE: Concepts are for illustrative purposes only. Further assessment of DE feasibility recommended.

185TH ST. STATION – DEVELOPMENT

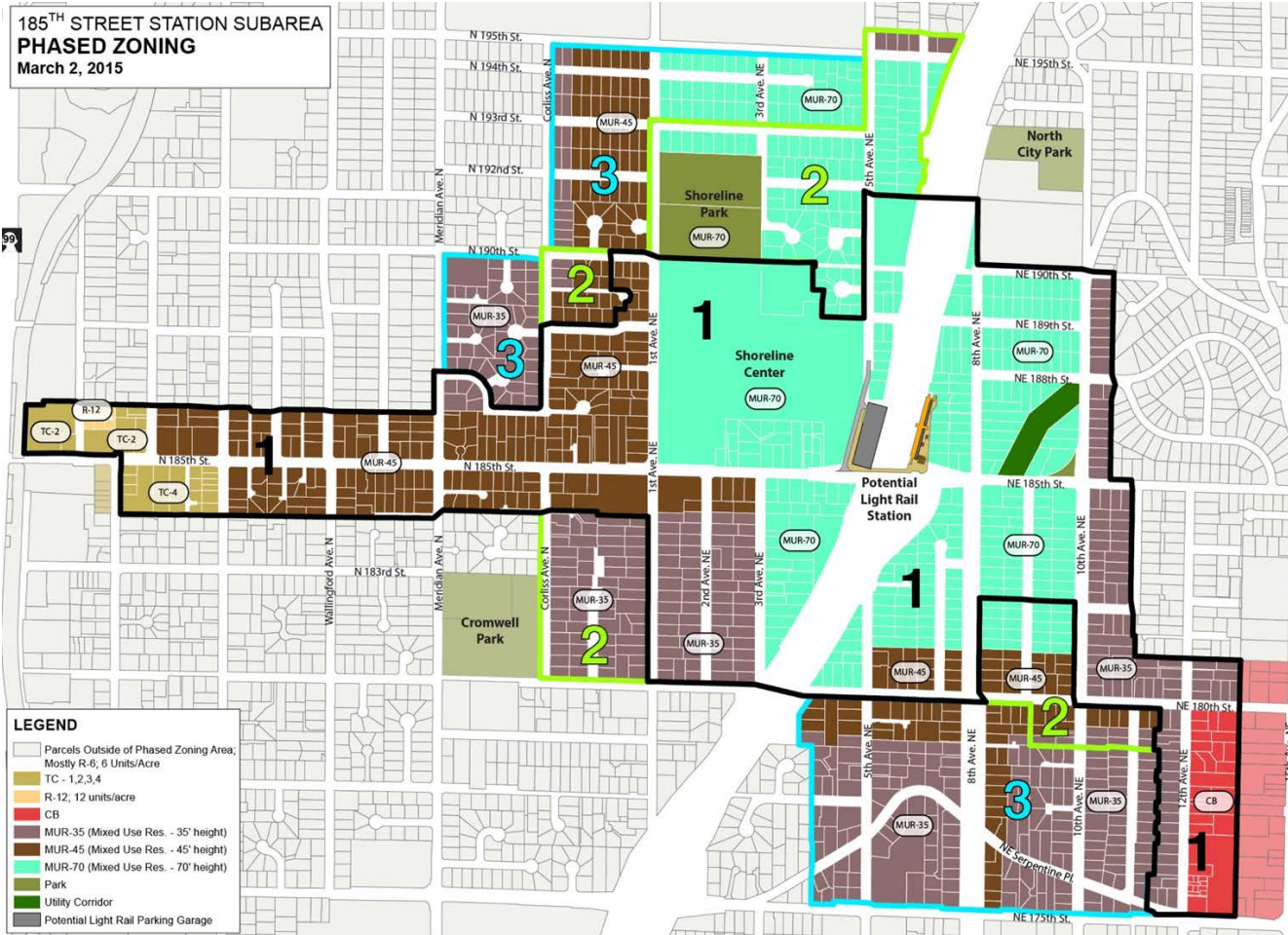
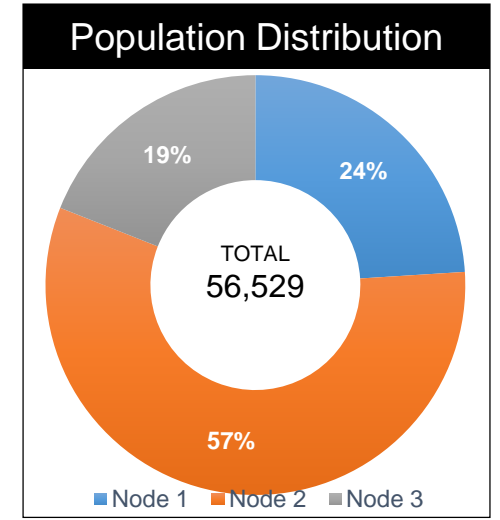
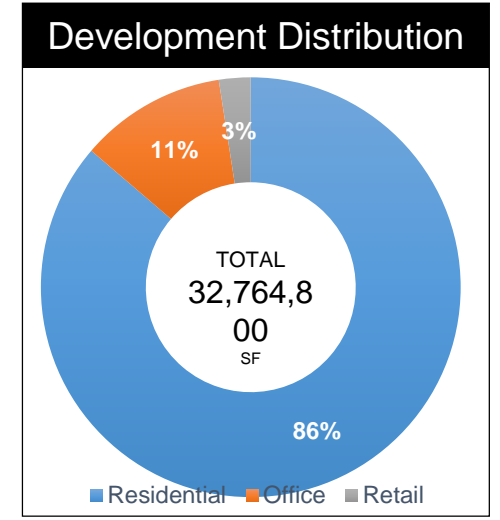
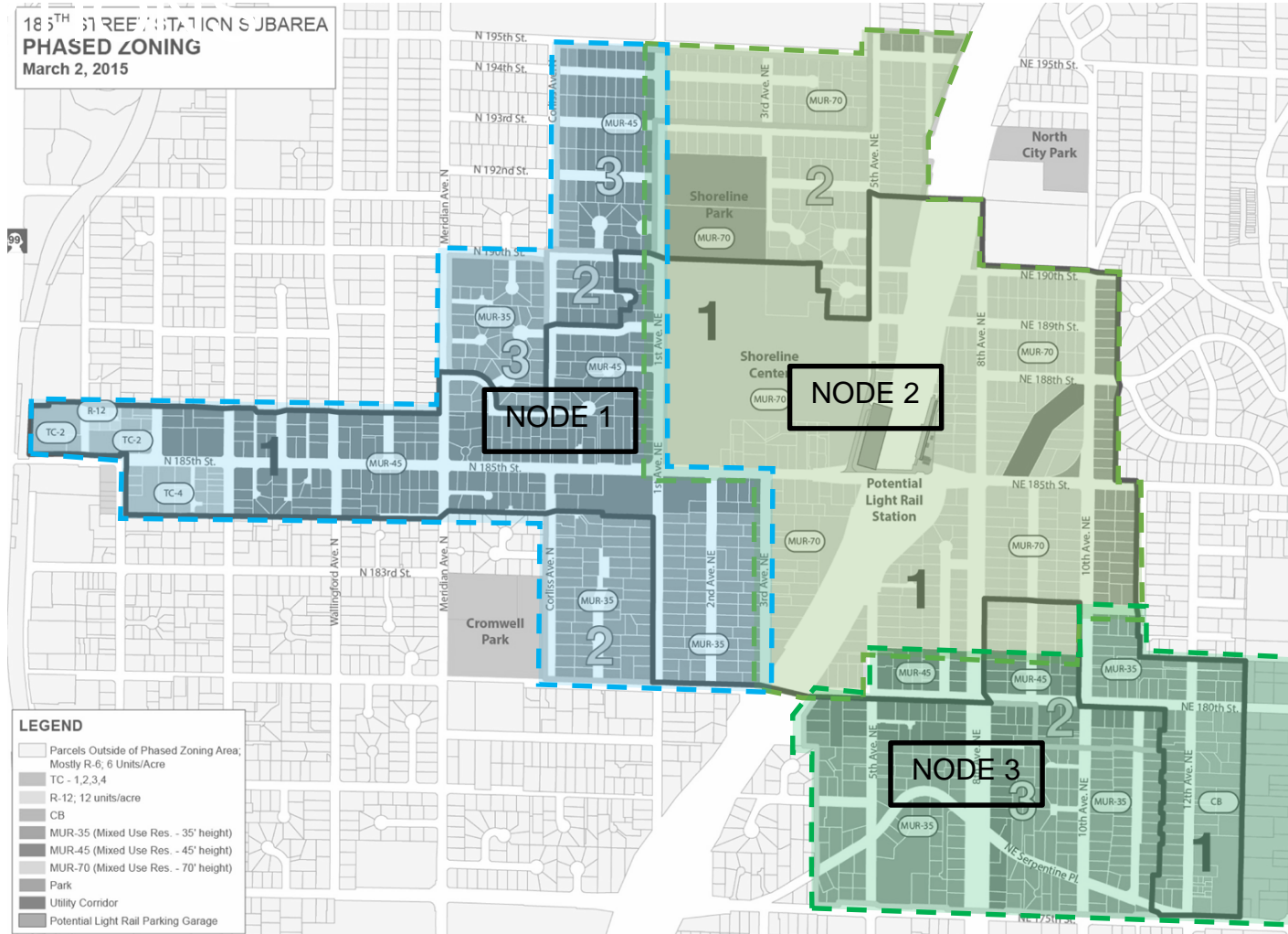


Table 3.2-13 Estimated Twenty-Year and Build-Out Population, Households, and Employment Projections

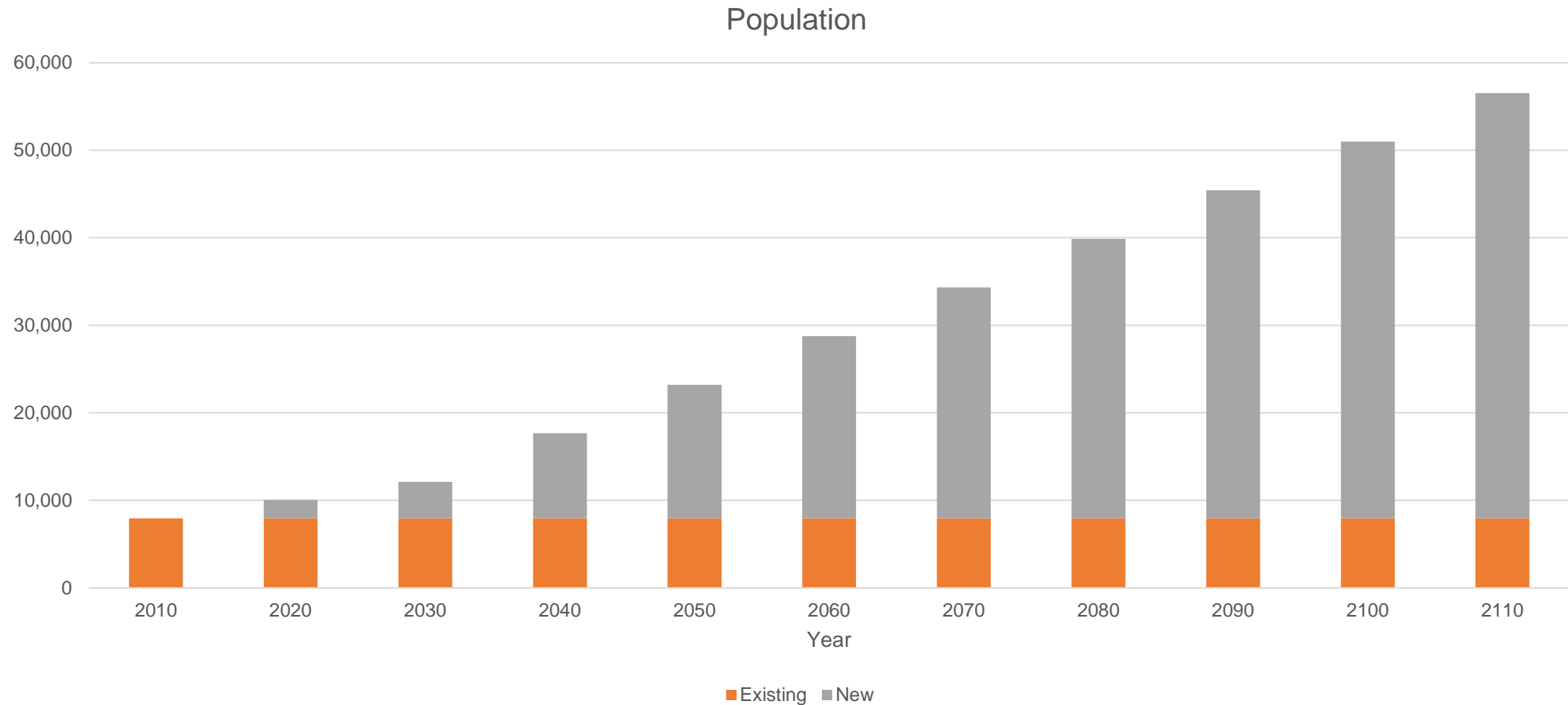
	Alternative 4 - Preferred Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
2035 Population*	10,860 to 13,343	10,860 to 13,343	10,860 to 13,343	10,860 to 13,343	10,860 to 13,343
2035 Households*	4,450 to 5,500	4,450 to 5,500	4,450 to 5,500	4,450 to 5,500	4,450 to 5,500
2035 Employees*	1,950 to 2,370	1,950 to 2,370	1,950 to 2,370	1,950 to 2,370	1,950 to 2,370
Build-Out Population	56,529	56,529	56,529	56,529	56,529
Build-Out Households	23,554	23,554	23,554	23,554	23,554
Build-Out Employees	15,340	15,340	15,340	15,340	15,340
Build-Out Years	80 to 125 years by 2095 to 2140	80 to 125 years by 2095 to 2140	80 to 125 years by 2095 to 2140	80 to 125 years by 2095 to 2140	80 to 125 years by 2095 to 2140

* Projections assume 1.5 percent to 2.5 percent annual growth rate for the action alternatives from the time the rezoning is adopted.

185TH ST. STATION – DEVELOPMENT



185TH ST. STATION – DEVELOPMENT



NOTE: DEVELOPMENT HORIZON VERY LONG FOR A DISTRICT ENERGY FEASIBILITY AND IMPLEMENTATION PLAN

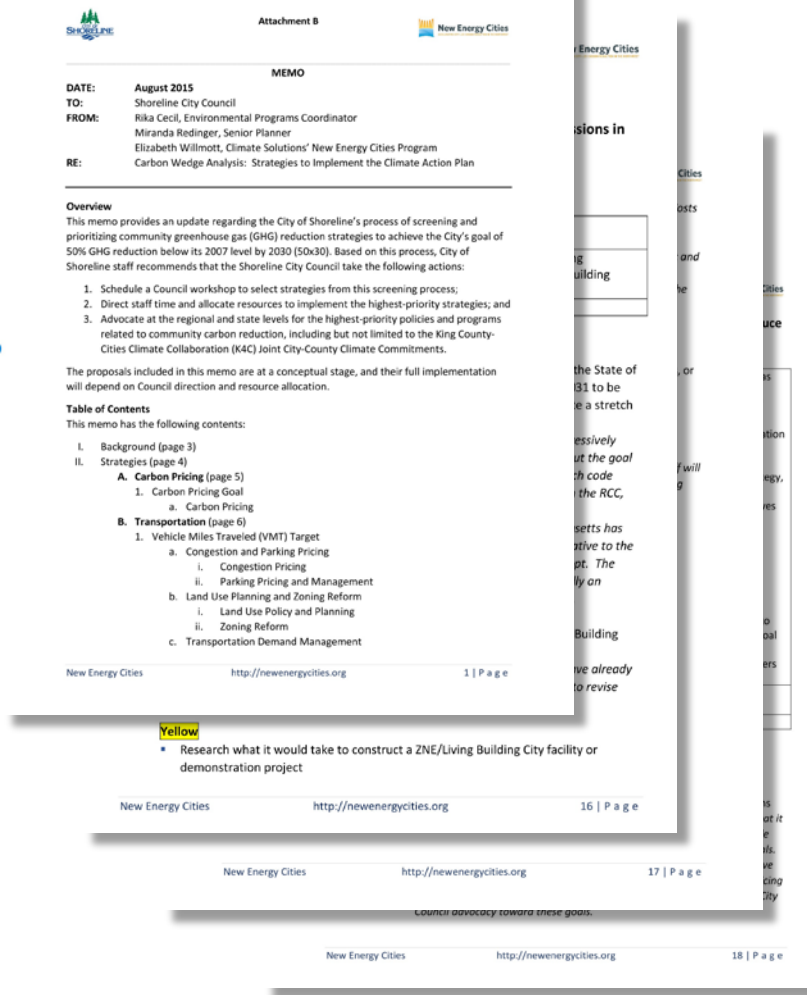
ACHIEVING SHORELINE CLIMATE ACTION

SCOPE SHIFT: IDENTIFY HOW BEST TO ACHIEVE SHORELINE CLIMATE ACTION PLAN GOALS FOR THE 185TH ST. STATION AND WHAT THE ROLE OF DISTRICT ENERGY WOULD.

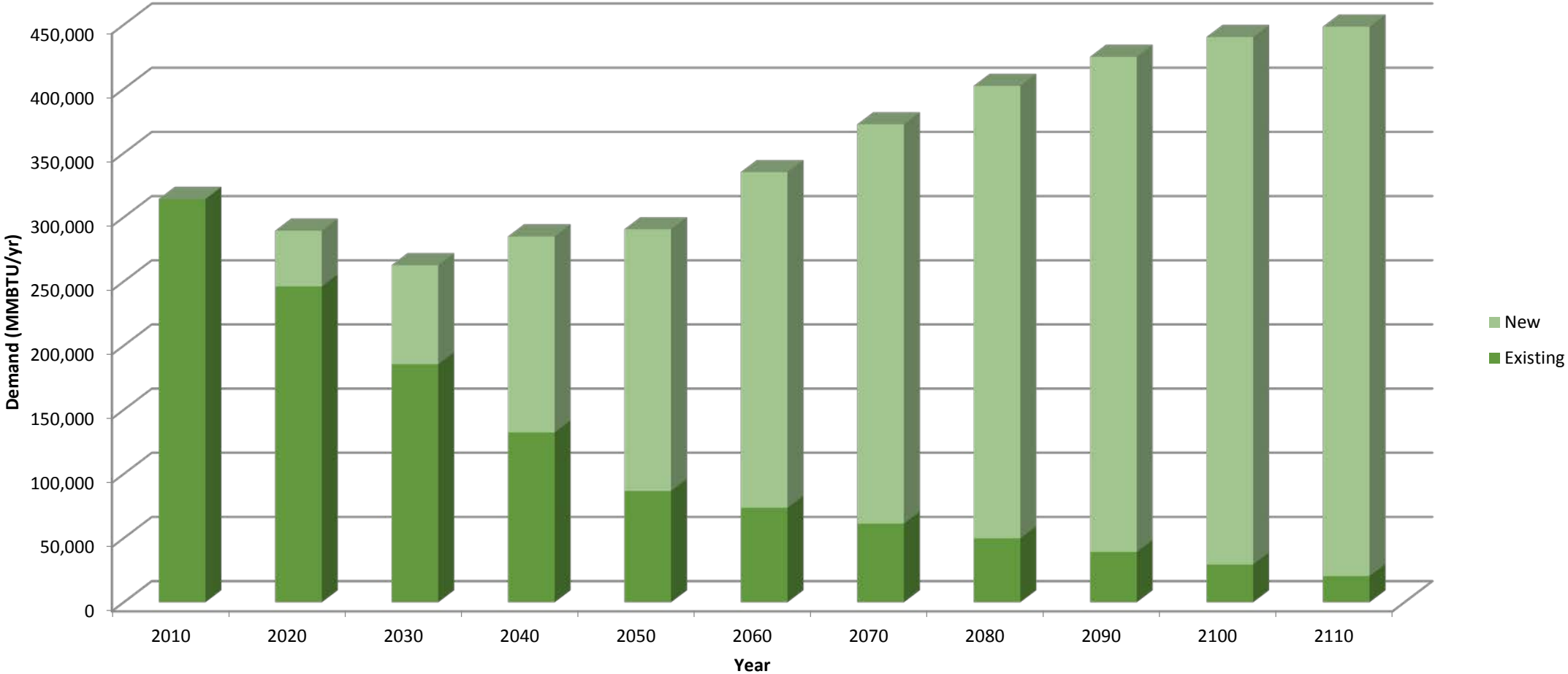
SHORELINE CLIMATE ACTION PLAN GOALS (KING COUNTY):

Greenhouse gas emissions reduction targets:

- 25% Reduction by 2020
- 50% Reduction by 2030
- 80% Reduction by 2050

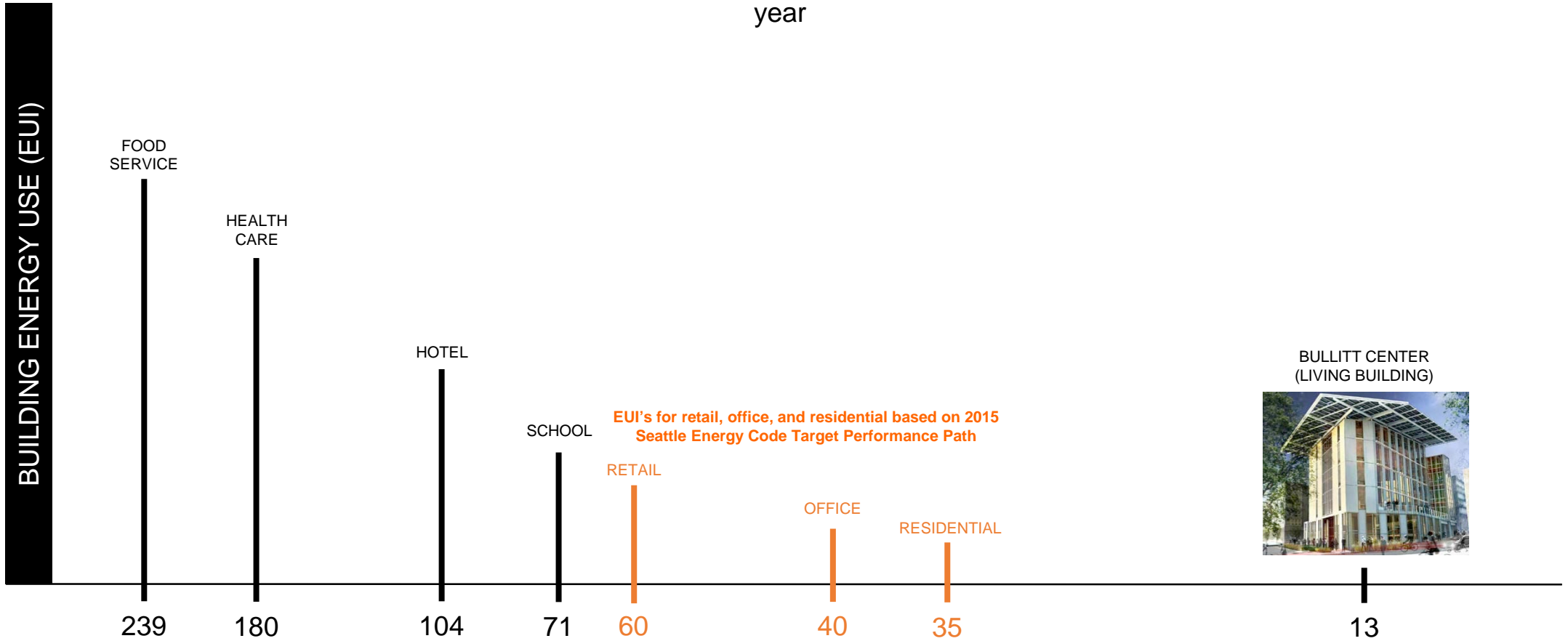


185th ST. STATION – ENERGY DEMAND

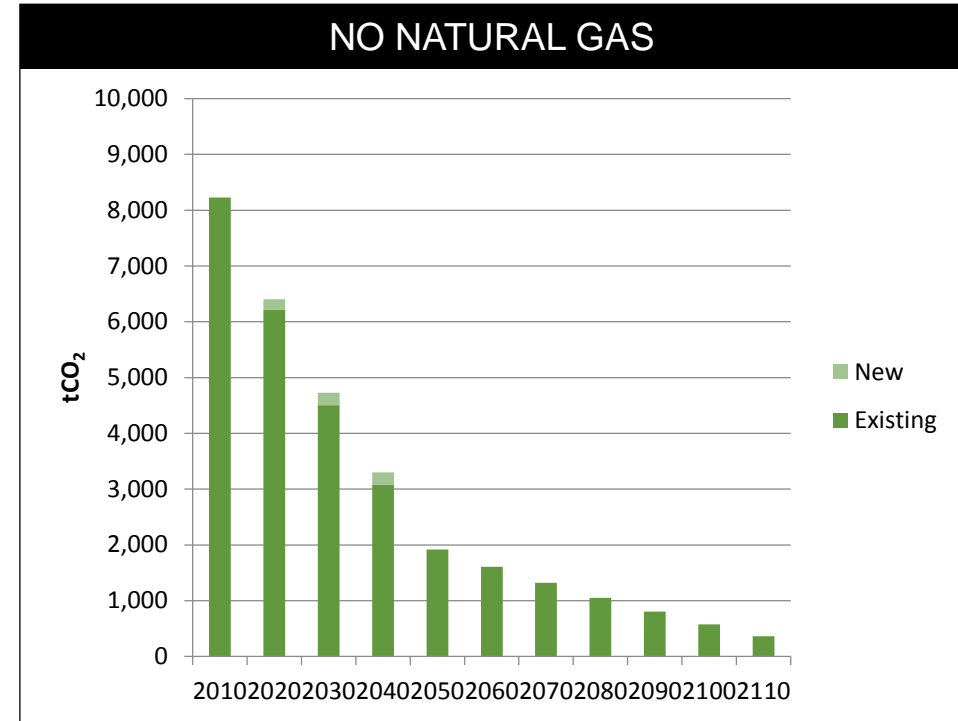
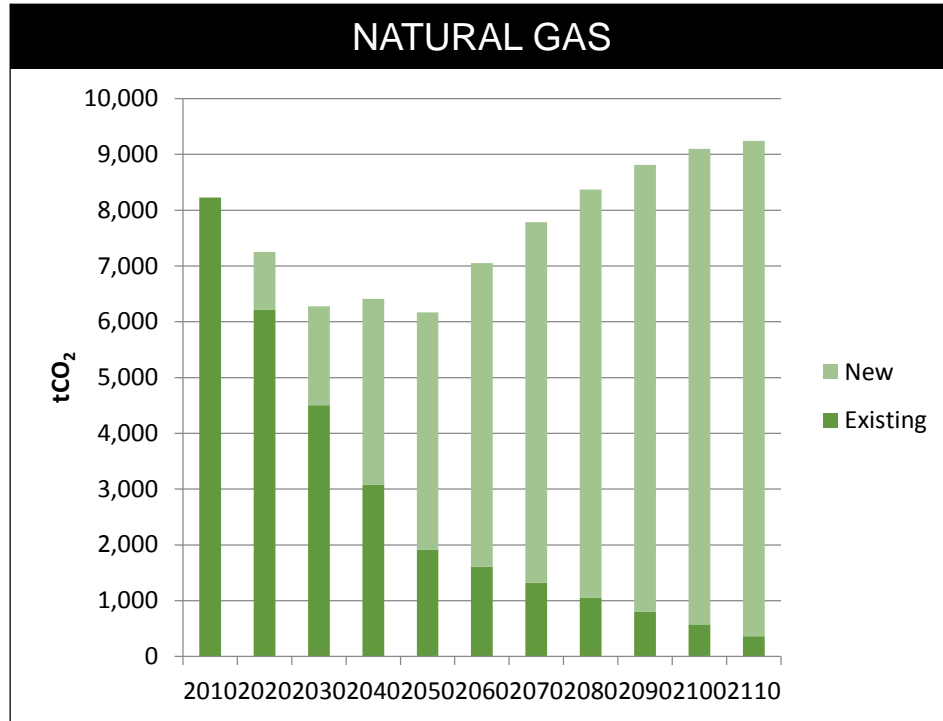


185th ST. STATION – ENERGY DEMAND

Energy Use Intensity (EUI) = kBTU/sf
year



185th ST. STATION – GHG



POLICY DECISION – GAS VS. NO GAS

*ACHIEVING THE SHORELINE CLIMATE ACTION
PLAN GOALS AT 185TH ST. STATION*

ONE GOAL

FIVE ACTIONS

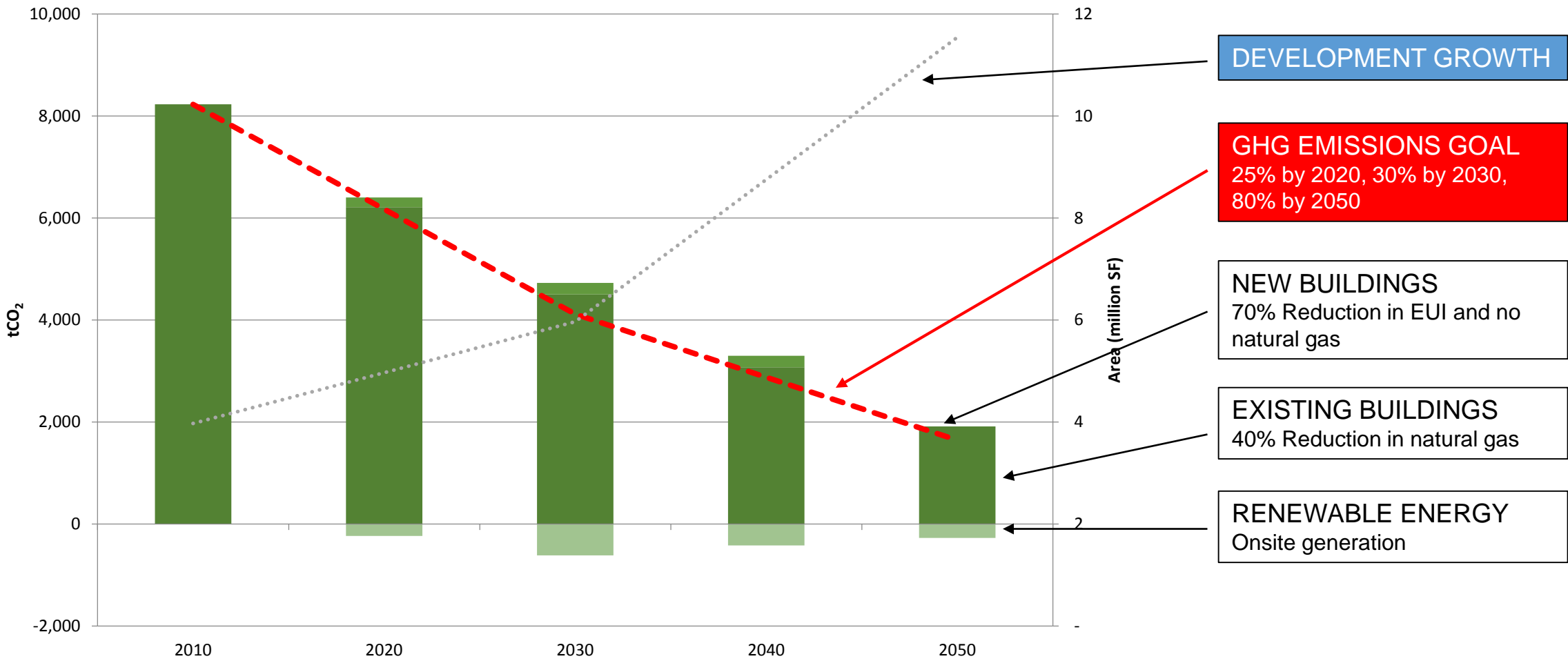
THIRTY YEARS

ACHIEVING CLIMATE ACTION PLAN

FIVE KEY ACTIONS:

1. NO USE OF COMBUSTION OR NATURAL GAS HEATING IN NEW BUILDINGS
2. INCREASED ENERGY EFFICIENCY IN NEW BUILDINGS
3. RETROFIT EXISTING BUILDINGS FOR GREATER ENERGY EFFICIENCY AND FUEL-SWITCH FROM COMBUSTION HEATING
4. UTILIZE ONSITE RENEWABLE ENERGY
5. DEVELOP DISTRICT ENERGY AND COMBINED HEAT AND POWER SYSTEMS

ACHIEVING CLIMATE ACTION PLAN



THE FIVE ACTIONS – RECOMMENDATIONS &

1. NO USE OF COMBUSTION OR NATURAL GAS HEATING IN NEW BUILDINGS

- Potential policy decision for City Council.

2. INCREASED ENERGY EFFICIENCY IN NEW BUILDINGS

- Continue to require Built Green 4 Star for all new buildings.
- No natural gas use.
- Implement Net-Zero Demonstration Pilot

3. RETROFIT EXISTING BUILDINGS FOR GREATER ENERGY EFFICIENCY AND FUEL-SWITCH FROM COMBUSTION HEATING

- Establish existing building energy efficiency retrofit program.
- Also, consider converting existing buildings to reduce natural gas use.

4. UTILIZE ONSITE RENEWABLE ENERGY

- Prepare program to achieve 1.25MW onsite renewable energy target (solar PV).

5. DEVELOP DISTRICT ENERGY AND COMBINED HEAT AND POWER SYSTEMS

- As Node 2 of the 185th St. Station moves closer to development, prepare district energy feasibility assessment and begin to execute implementation.