CEP Scenario A
Home and Buildings

- All Buildings
  - 45% of all energy use in City
  - Efficient renovation of 2.6% of building stock per year
  - New construction more efficient - 50% of current code by 2050
  - Selective densification

- Home and Building Energy Performance Labeling
  - “Aggressive” voluntary approach from 2011
  - Use ASHRAE/EU approach

- Single Family Homes
  - Standardized renovation packages financed by owner & City or HBPW
    - 2013 to 2033 – “Moderate” package – 53% efficiency
    - 2034 to 2050 – “High efficiency” package – 66% efficiency
    - Facilitated by neighbourhood or other community groups
  - AC and Refrigerator exchange programs

- Non-residential, Large MFH and Retirement Communities
  - Public buildings and churches act as living examples
  - Early adopters of Energy Performance Labeling
  - Equal focus on both efficient operation and construction
  - Energy master planning – clusters; major renovations; large developments

Systematically Raise Efficiency

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CEP Scenario A
Industrial and City Energy Services

- Tailored Industrial Energy Services
  - 20MW CHP phased with Battery Cluster growth
  - District heating services using CHP, existing boilers and waste heat
  - Environmental services for Battery Cluster for VOC elimination*
  - Additional utility and efficiency services tailored to investors’ needs
  - Up to 1.0 % efficiency/year based on corporate programmes

- District Heating
  - Develop district heating services north from 24th Street
  - “Anchor tenants” – Hope College / Hospital / Aquatic Center / City
  - Snow melt services as option in heating service package

- City Energy Supply
  - Maintain existing solid fuel plant through 2050
  - Add 55MW CCGT De Young Site in three phases by 2026
  - Configure CCGT to supply District Heating
  - “Green Power” sourcing Landfill (10MW)

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*Turbine combustion air
CEP Scenario A
Transportation and Enabling Strategies

- **Transportation**
  - Efficiency gains from market evolution
    - Revised Federal CAFE Standards
    - Weight reduction from new materials
    - Trend to smaller vehicles
    - Drive-train efficiency increases
  - Efficiency gain from urban design and city services
    - Modest densification combined with mixed use
    - Snow melt extends use of walkable neighborhoods
  - Opportunity for experimentation
    - Biodiesel / Ethanol
    - Tied with economic development / University

- **Training, Education and Outreach**
  - In development

- **Economic Development Support**
  - In development

- **Incentives, Regulatory, Business Models**
  - In development
CEP Scenarios B and C

- **Scenario B**
  - *CEP Scenario A plus…*
  - 24MW of Solar PV to eliminate summer peak – start in 2012 complete by 2050
  - Add 20MW Biomass Generating Block after 2030 using bio-gasification
  - Blend bio-gas/natural gas starting in 2013 and leveling off at 10% by 2023 for CHP and CCGT
  - Add 37 MW<sub>nom</sub> Wind by 2020

- **Scenario C**
  - *CEP Scenario B with …*
  - Add 70 MW Solid Fuel with 30% biomass by 2050
  - CCGT not implemented

All Scenarios Focus on Efficiency