Workshop Segment 3:
Carbon-Based Building Codes and Standards
Intersection of Step Code and DE in Surrey

IDEA Annual Conference

June 11, 2018

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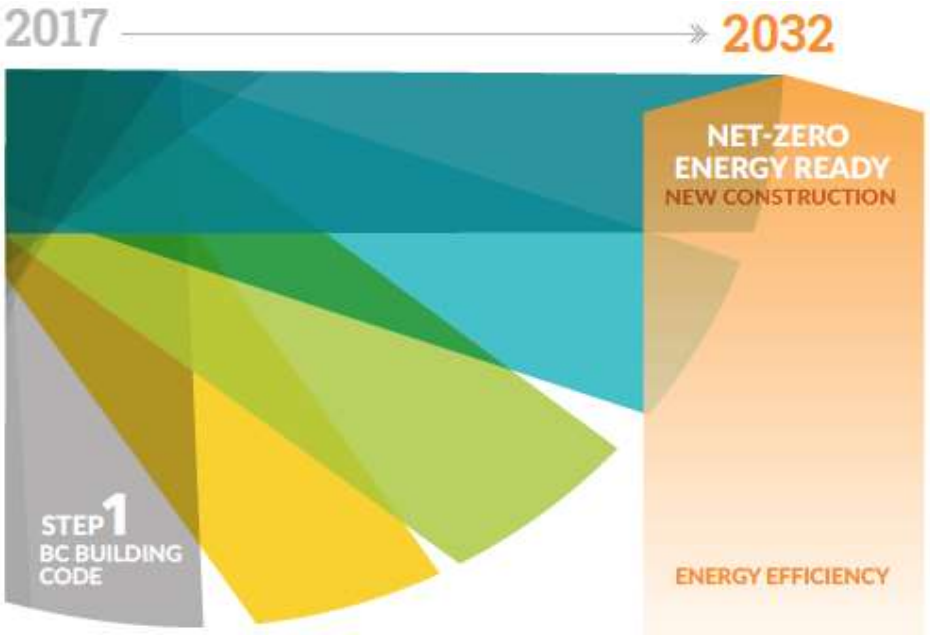
BC Energy Step Code



- Reduce energy consumption
- Reduce operational cost
- Reduce GHG's (indirectly)

→ Demand-side Approach

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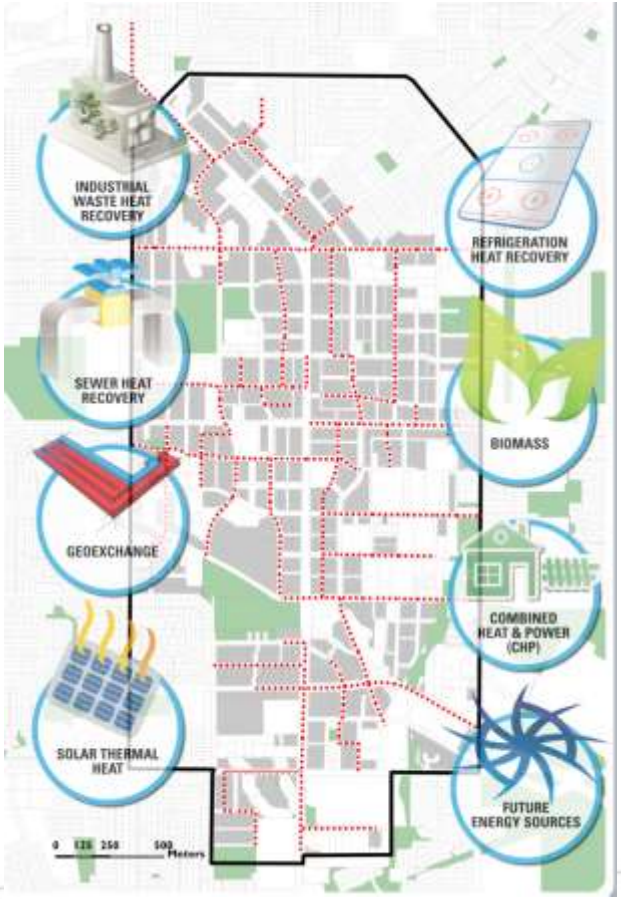
Low-Carbon DE

- Improve upstream energy efficiency
- Reduce greenhouse gas emissions
- Increase resilience
- Competitive and stable pricing.

→ Supply-side Approach



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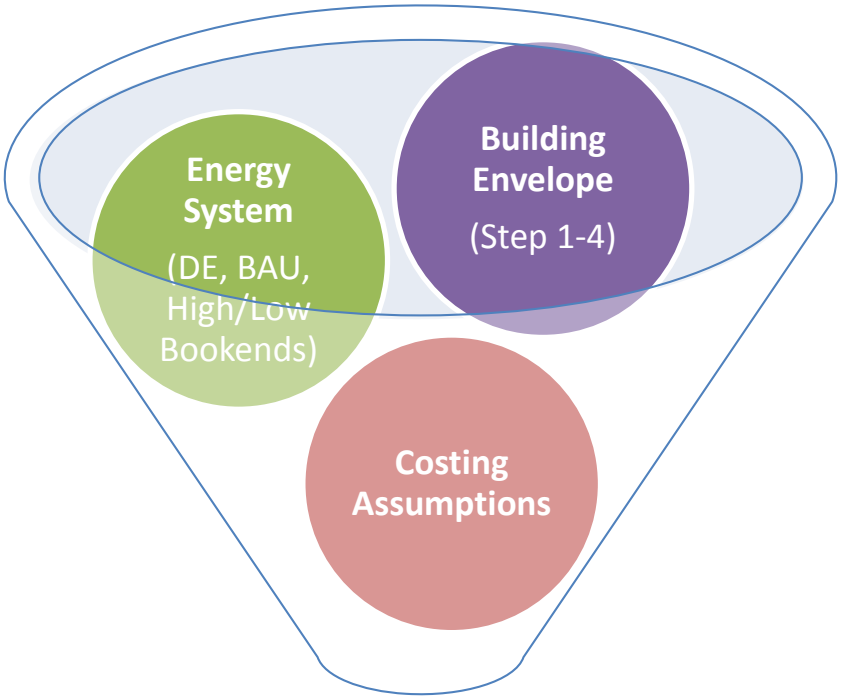
Surrey's Objectives

- Advance energy efficiency in new buildings
- Ensure greenhouse gas reductions are being achieved
- Promote alignment with neighboring jurisdictions
- Consider impact on investments in low-carbon DE
- Minimize life-cycle costs

Analysis of Step Code and DE

Predominant building archetype:
Concrete high-rise MURB



GHG +Life-Cycle cost

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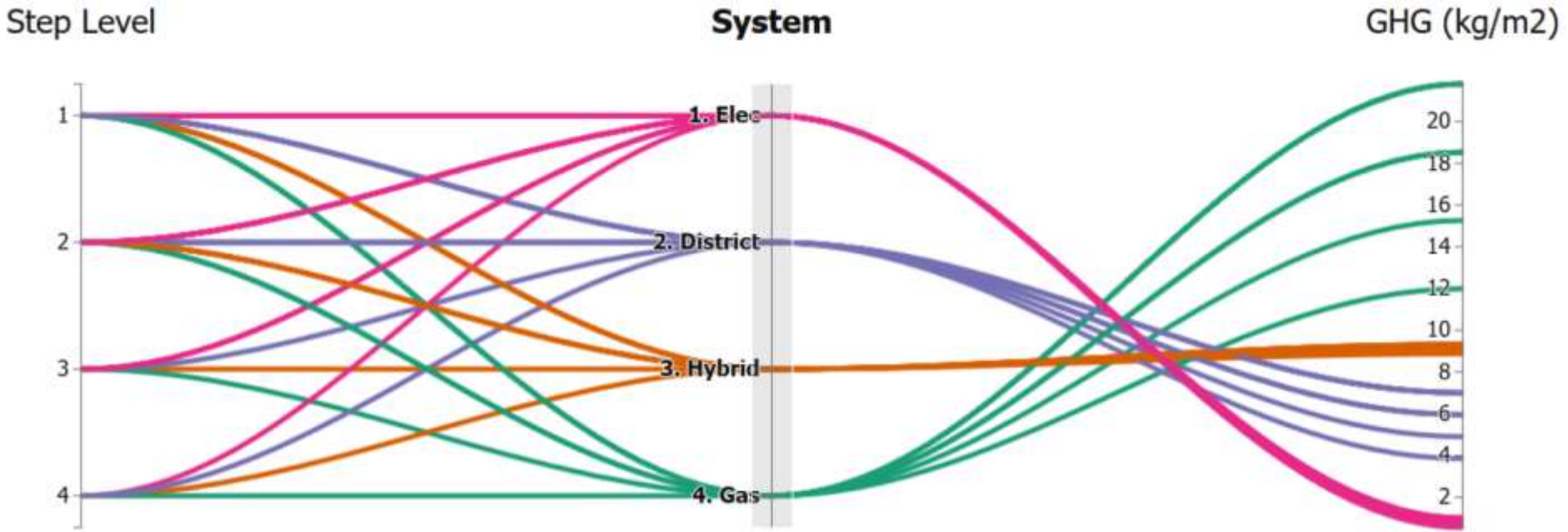
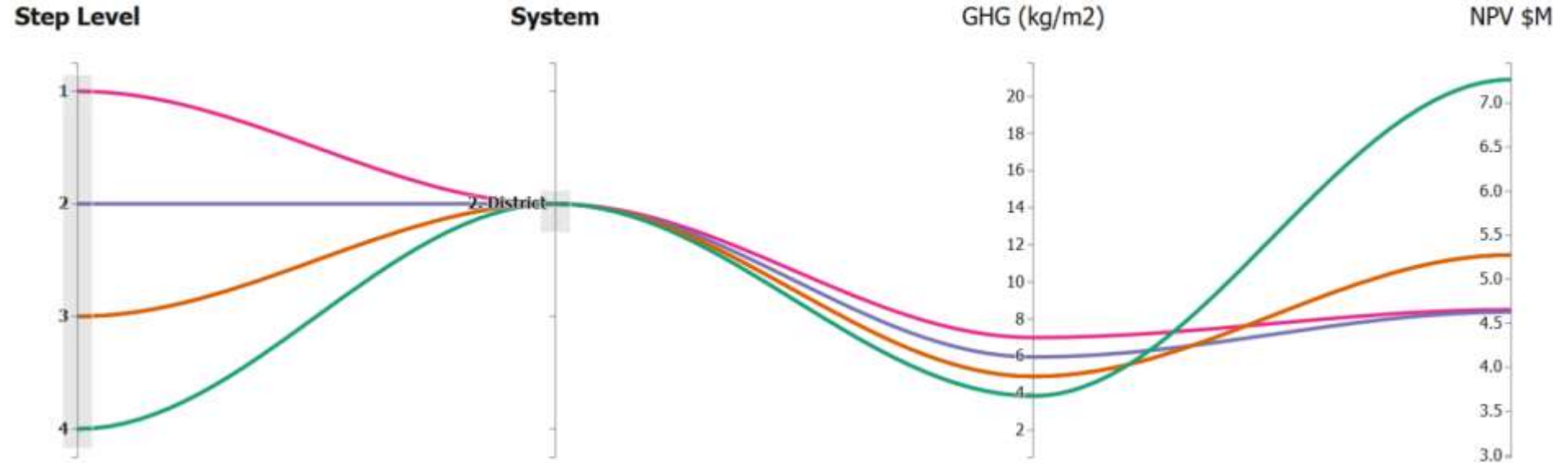
Finding #1

- GHG outcomes are most dependent on Energy System type, not Step Code Level.



Finding #6

- Step Code level 2 results in the lowest life-cycle cost for DE connected buildings.
- GHG outcomes would be lower at Steps 3 & 4 but would require significant up-font capital investment ($800k-$5.9M).



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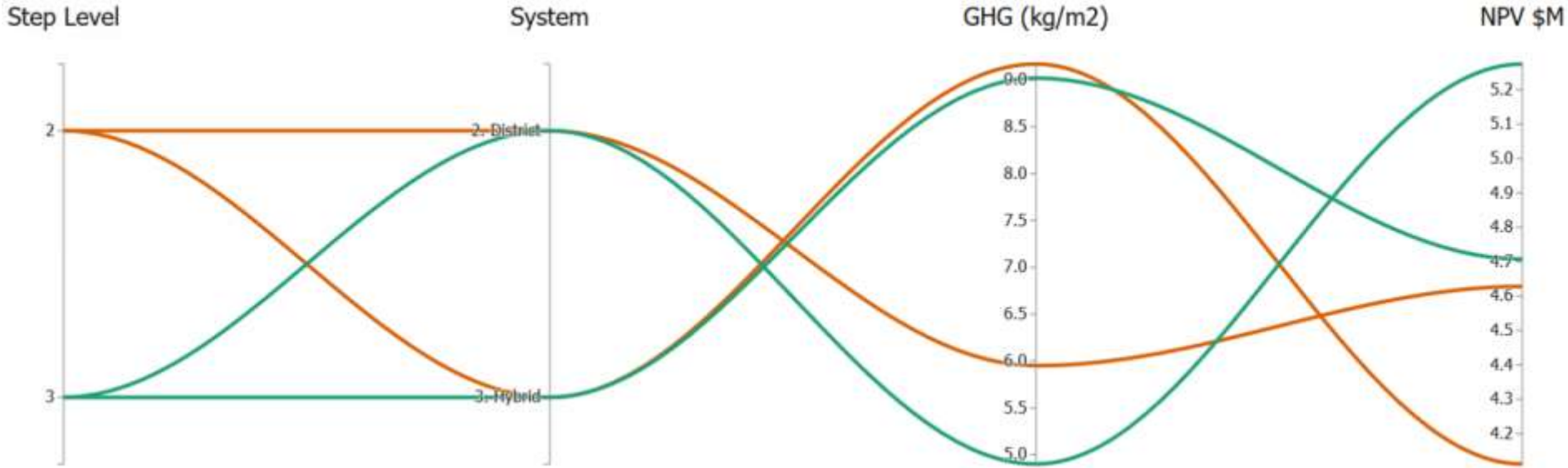
Finding #4 (continued)

- The District system at Step 2 results in ~ 2/3 of the GHG outcome than Step 3 of the Hybrid system at a lower life-cycle cost.



Alternate Pathways to Low-Carbon Buildings

High Performance Envelope

- Fuel neutral
- High efficiency envelope and equipment (Step 3/4)
- Net-zero ready

Low Carbon Pathway:

- DE or On-site low carbon system
- Cost effective envelope improvements (Step 2)
- Carbon Intensity = 0.07 tonnes CO_2E/MWh

Building Energy Benchmarking

Key Takeaways

- Step Code and District Energy are being used in Surrey as building policy tools to achieve GHG reductions
- GHG outcomes and lifecycle costs are the metric for success
- No one-size fits all strategy, need to balance policies to achieve optimal outcomes

Thank You.

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