FTI Simulation v Reality

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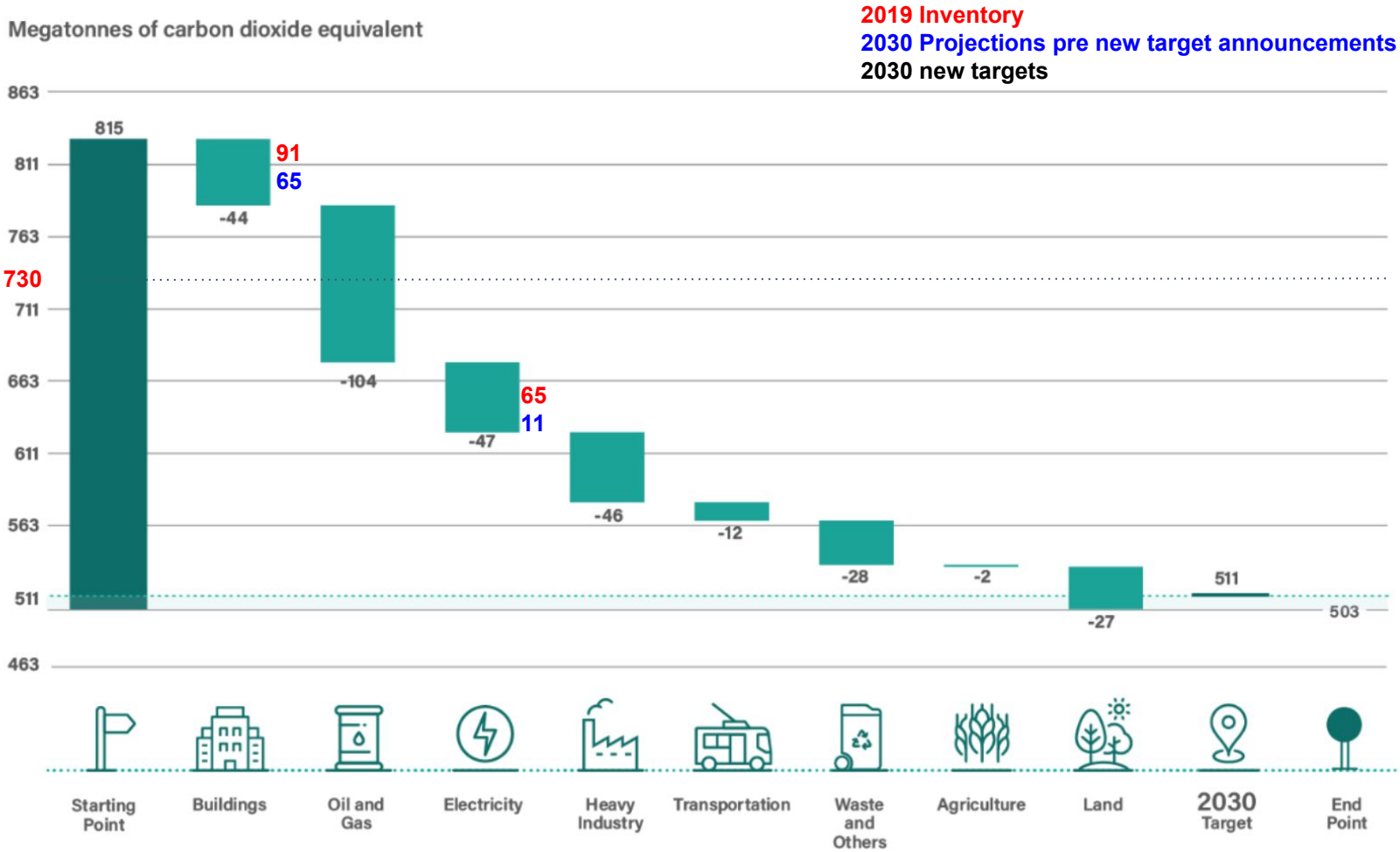
EllisDon
SUSTAINABLE BUILDING SOLUTIONS

Trudeau pledges to cut emissions by 40-45 per cent by 2030, short of U.S. goal

Prime Minister Justin Trudeau rises during question period in the House of Commons on Parliament Hill in Ottawa on Wednesday, March 24, 2021. (THE CANADIAN PRESS/Sean Kilpatrick)

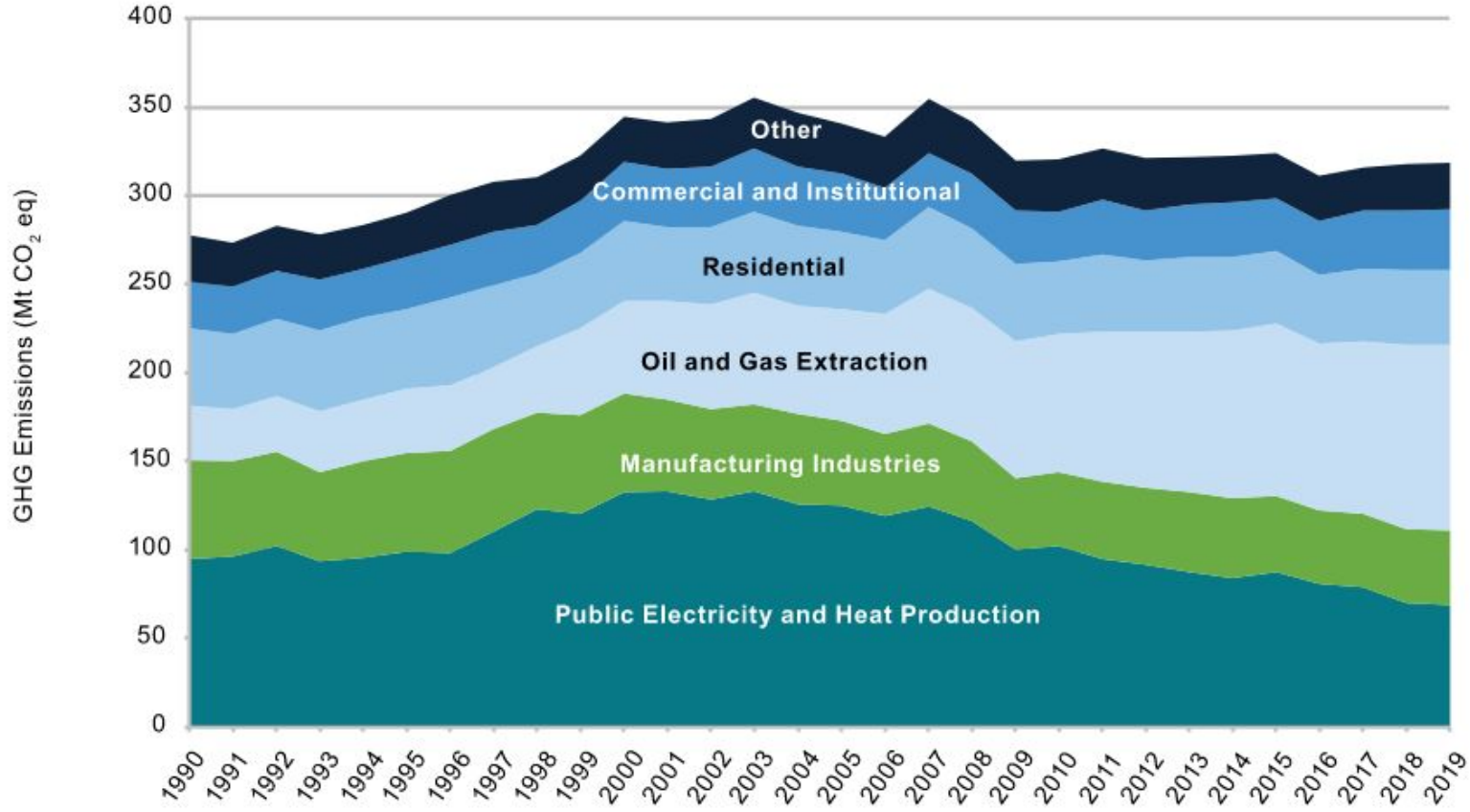
Sources of emission reductions contributing to reaching the 2030 target



https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/progress-towards-canada-greenhouse-gas-emissions-reduction-target.html


“near zero carbon” for all new buildings immediately and 1/3 of existing building stock in the next decade

Figure 2–8 **Trends in Canadian GHG Emissions from Stationary Combustion Sources (1990–2019)**



Note: "Other" includes Petroleum Refining, Construction, Mining, Agriculture and Forestry

METRICS VS OUTCOMES

metric[1] [me-trik] SHOW IPA

See synonyms for: metric / metrics on Thesaurus.com

adjective

1 pertaining to the meter or to the metric system.

noun

2 Often **metrics** . a standard for measuring or evaluating something, figures or statistics:
new metrics for gauging an organization's diversity;
pretty good by any metric.

outcome [out-kuhm] SHOW IPA

See synonyms for *outcome* on Thesaurus.com

noun

1 a final product or end result; consequence; issue.

2 a conclusion reached through a process of logical thinking.

METRICS VS OUTCOMES

EUI / Source / Primary	Resource Efficiency
Thermal Energy Demand Intensity	Comfortable Resilient
GHG Emissions	Zero Emissions
Energy Cost	Buildable

OPTIMIZATION VS INTUITION

Net-Zero Navigator

Explore | Building Type: Medium Office | Lo

Colour by Axis: TEDI (eKWh/m2)

Colour Palette: Spectral

Select parameters | Selected 10

Architectural

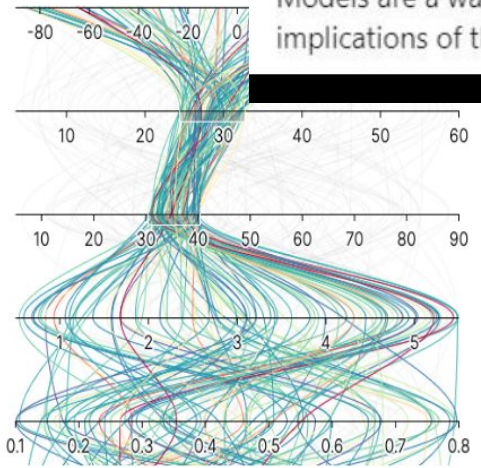
Orientation degrees from north

Wall Insulation R-Value

Roof Insulation R-Value

Glazing U-value W/m2K

Glazing SHGC N/A

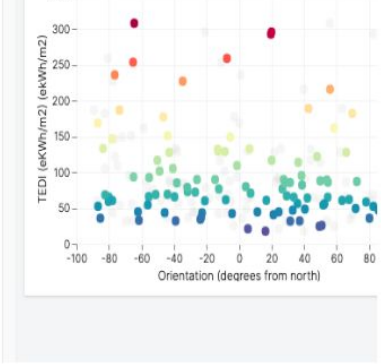


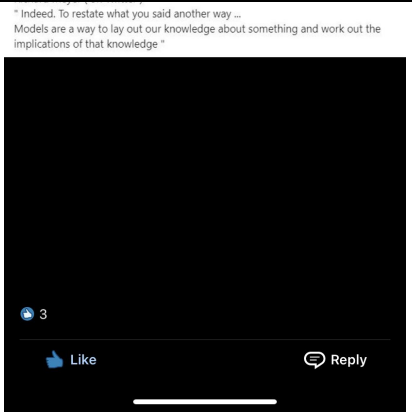
Jesse Jenkins, PI of ZERO Lab

" This is what I teach my students: model for intuition and insight on complex systems, not for numbers. We don't build models to be fancy calculators. We build them because it's the only way to conduct experiments and build intuition on complex, dynamic, macro-scale systems"

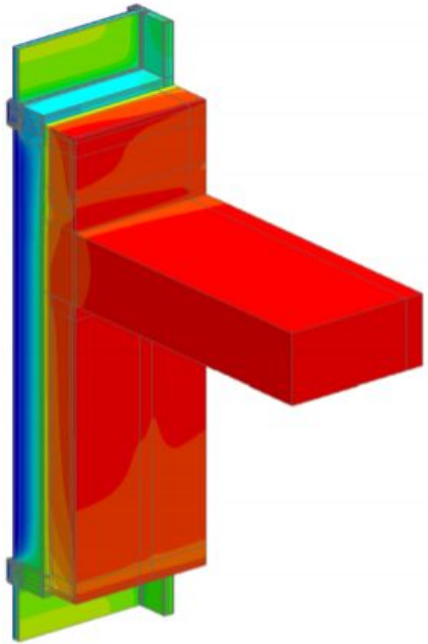
Richard Meyer (on Twitter)

" Indeed. To restate what you said another way ...
Models are a way to lay out our knowledge about something and work out the implications of that knowledge "





PRECISION VS ACCURACY



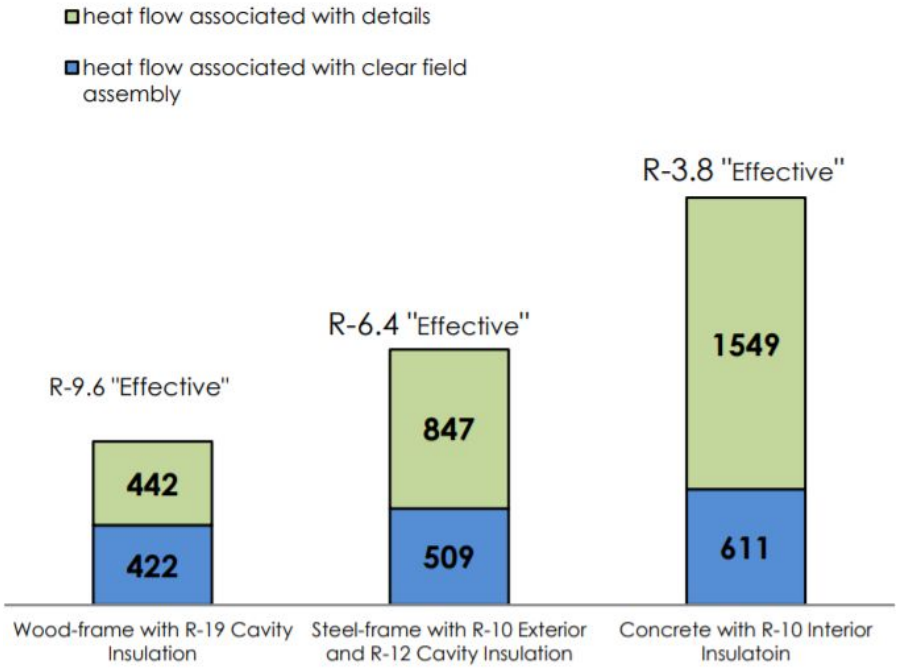
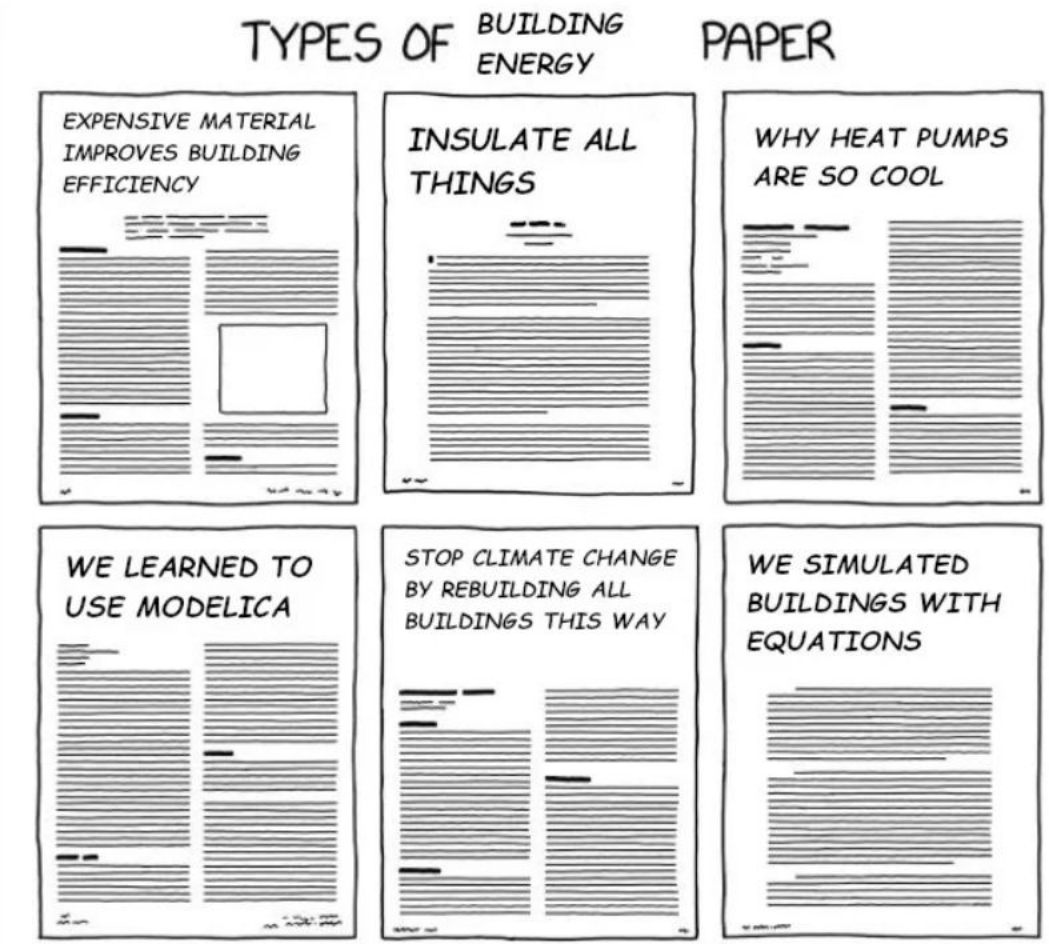


Figure 3.3: Comparison of Relative Contribution of Heat Flow (W/K) to the Effective Thermal Resistance (°F ft2 hr/BTU) for Various Construction Types


TYPES OF BUILDING ENERGY PAPER
EXPENSIVE MATERIAL IMPROVES BUILDING EFFICIENCY
INSULATE ALL THINGS
WHY HEAT PUMPS ARE SO COOL
WE LEARNED TO USE MODELICA
STOP CLIMATE CHANGE BY REBUILDING ALL BUILDINGS THIS WAY
WE SIMULATED BUILDINGS WITH EQUATIONS

SIMULATION VS REALITY

Be guided by the science, educate your clients on context

Set direction based on knowledge and intuition

Support the team to optimize towards project outcomes

Build internal capacity along different skill sets

Comply with metrics