



INSTITUT
POLYTECHNIQUE
DE PARIS

DIVERSITY AND SUSTAINABILITY TRADE-OFFS IN GROUP THERMAL COMFORT PROVISION

ON COMFORT, CONSUMPTION AND EQUALITY

Jun MA

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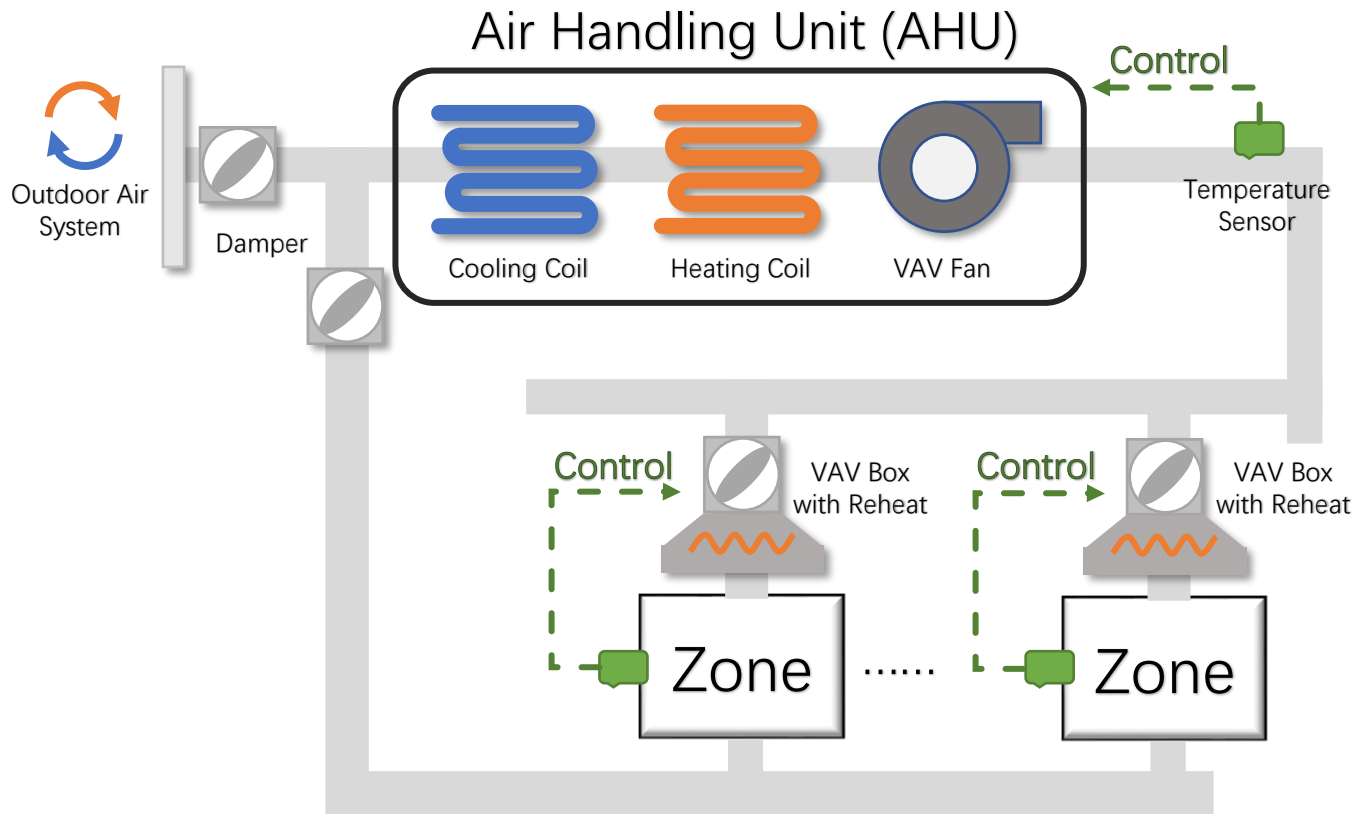
In collaboration with: Roberto Yus – UMBC, USA

22/03/2023

Submitted to FAccT 2023

MOTIVATION

BALANCE CONSUMPTION AND COMFORT ON THE HVAC SYSTEM

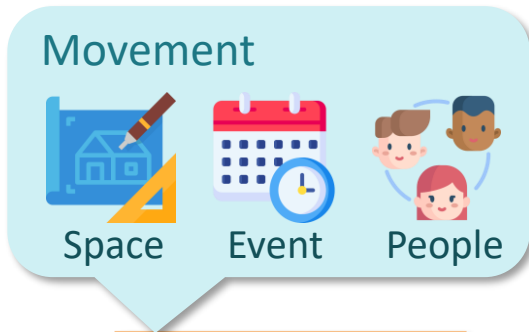


30-50%

Energy consumption in
commercial buildings



METHODOLOGY

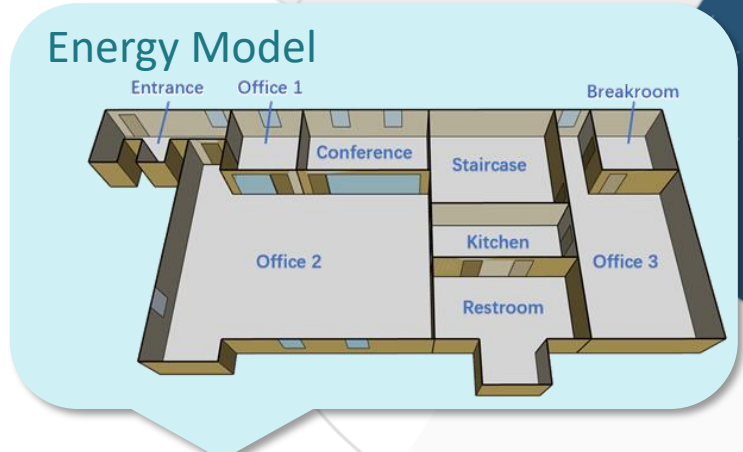
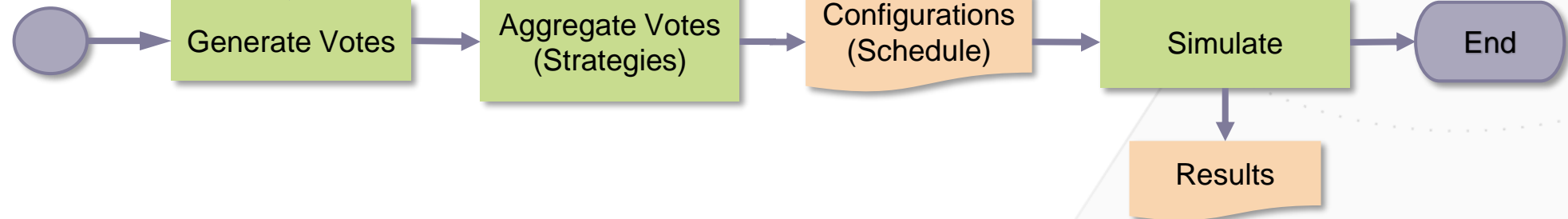


Thermal Preference

	20 °C	21 °C	22 °C	23 °C	24 °C	25 °C	26 °C	27 °C
Warm Preferred	-2	-2	-1	-1	0	0	0	1
Neutral	-1	-1	0	0	0	0	1	1
Cold Preferred	-1	0	0	0	1	1	2	2

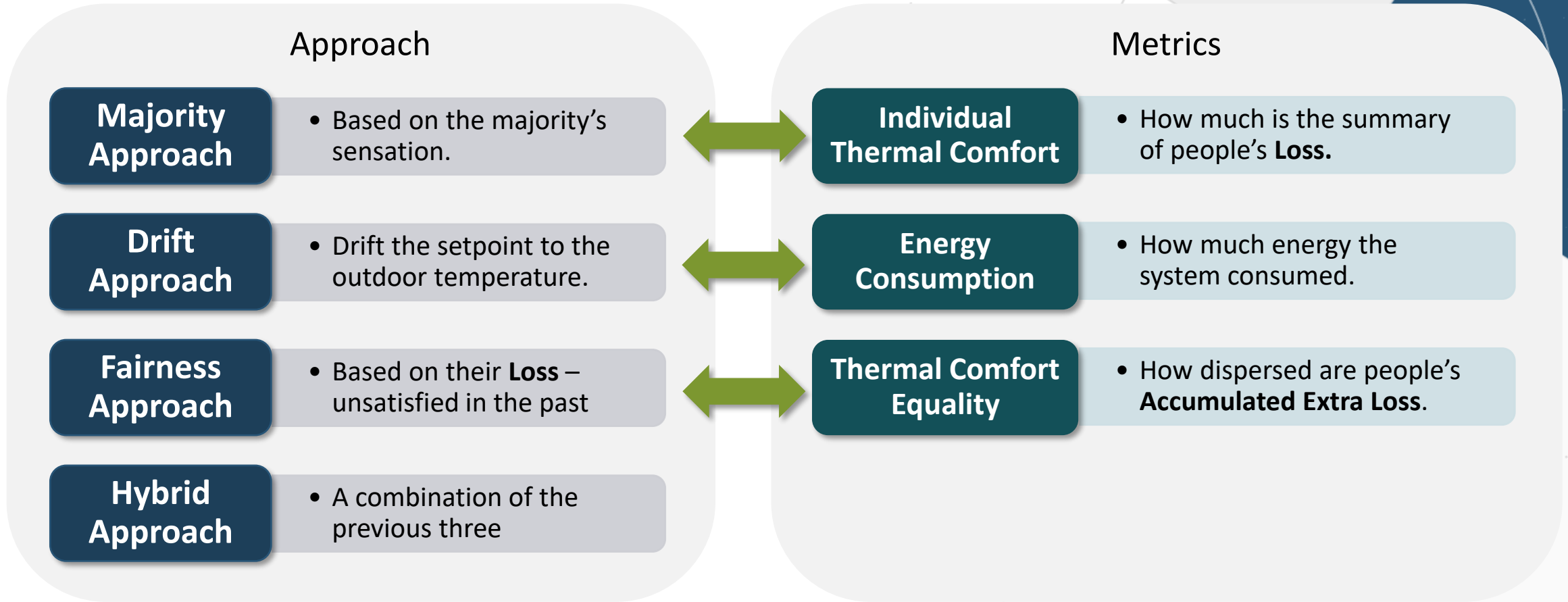
Occupant Location

Occupant Profile

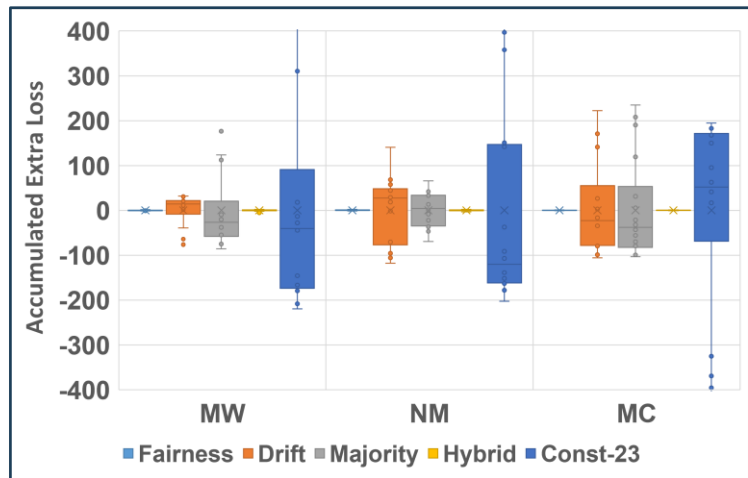
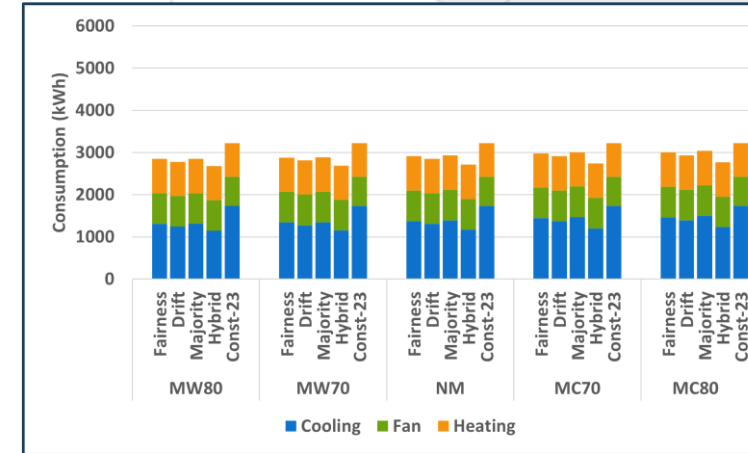
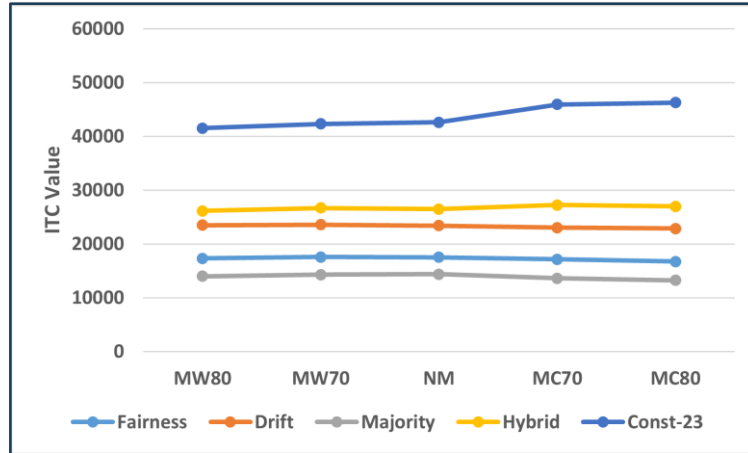


Building and HVAC System

STRATEGIES AND METRICS



RESULTS



City	Fairness	Drift	Majority	Hybrid	Const-23
Mumbai	-0.53	-0.17	-0.22	-0.67	1.58
Cairo	-0.50	-0.15	-0.29	-0.65	1.58
Los Angeles	-0.50	-0.22	-0.30	-0.60	1.61
Paris	-0.34	0.25	-0.04	-0.19	0.32
New York	-0.51	-0.16	-0.19	-0.64	1.51



Thank You!

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