



Thanks to our Funders

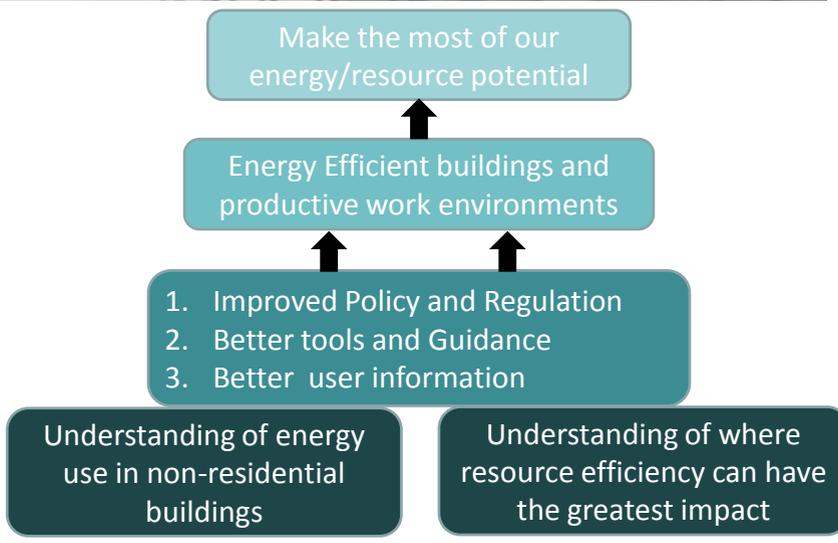


Today's Presentations



- Overview of BEES - Data Collection
 - Christchurch CBD Energy Modelling
 - Optimising Energy Performance
 - Rebuilding with Different Building Owner Imperatives
 - Post Occupancy Evaluations
 - High and Low Energy Use Indices
 - Water Use – an Auckland Study
 - Summary
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BEES Goals and Outcomes



NZ Non-Residential Building Stock



Floor Area Strata	1	2	3	4	5	Total
Minimum Floor Area	5 m ²	650 m ²	1,500 m ²	3,500 m ²	9,000 m ²	
Approx. No. of 'Buildings'	23,000	6,000	2,600	1,000	400	33,000
% of Buildings	70%	18%	8%	4%	1%	100%
Total Floor Area (million m ²)	6,860	5,760	5,760	5,660	6,980	31,010
% floor	22%	19%	19%	18%	22%	100%

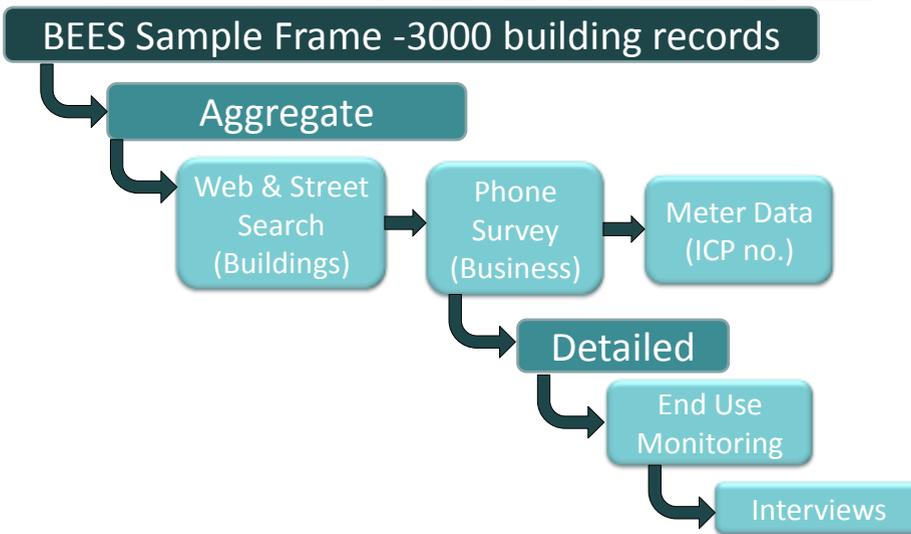
- ▶ **About 20% of floor area in very large number of**
 - Small floor area buildings (~ 23,000 under 650 m²)
- ▶ **About 20% of floor area in very small number of**
 - Large floor area buildings (~ 400 over 9,000 m²)

Source: Initial QV analysis.



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BEES Data Collection



Offices - Baseline data requirements



- Floor area
 - Occupied space
 - Hours of use
 - 20% of usual occupants present
 - Numbers of computers
 - Representative of electrical load & occupants
 - Energy use
 - Electricity
 - Gas
 - Fuel Oil
-

Net Floor area per Employee



Building Size	Count		m ² /employee		
	Valid	Missing	Mean	Median	Mode*
5-649m ²	32	2	47	34	6
650-1,499m ²	35	2	60	39	20
1,500-3,499m ²	69	1	113	40	15
3,500-8,999m ²	118	7	109	41	25
9,000+m ²	130	2	188	30	18
Total	384	14			

Note: * Multiple modes – lowest value given

- Wide variation shown by difference between mean, median & mode
 - Mean = average m²/person
 - Median = 50% of premises
 - Mode = Most popular
 - Median 40±1 m²/person for 650-8,999 m² buildings
 - Lower for smaller and larger buildings
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Source: BEES Phone Survey – preliminary results.

Full week occupancy



	Hours of Occupancy						TOTAL
	0 -> 34	35 -> 44	45 -> 59	60 -> 69	70 -> 168	Missing	
1-649 m ²	4	11	14	3	2		34
650-1,499 m ²	4	16	5	8	2	2	37
1,500-3,499 m ²	2	22	30	7	7	2	70
3,500-8,999 m ²	3	36	62	12	7	5	125
9,000 + m ²	7	27	57	25	11	5	132
TOTAL	20	112	168	55	29	14	398
	5%	28%	42%	14%	7%	4%	

- 77% of premises used 35 to 59 hours per week
- Interesting questions:
 - Why so low or so high occupancy hours?
 - Weekday only use?

Source: BEES Phone Survey – preliminary results.

Fuel Types



All have grid electricity	+ Self gen					TOTAL
	Elect	+ other	+ Nat Gas	+ Oil	+ Other	
5-649 m ²	29	1	3	-	1	34
650-1,499 m ²	33	-	3	1	-	37
1,500-3,499 m ²	64	1	3	1	1	70
3,500-8,999 m ²	114	3	7	1	-	125
9,000 + m ²	115	2	9	6	-	132
Total	355	7	25	9	2	398
%	89%	2%	6%	2%	1%	
Cumulative %	89%	91%	97%	99%	100%	

- 89% of businesses have only electricity
- 6% also have natural gas
- 2% have some form of self-generation

Source: BEES Phone Survey – preliminary results.

Proportion of Building occupied



	Whole Building	Partial Building	Total
5-649 m ²	3	31	34
650-1,499 m ²	3	34	37
1,500-3,499 m ²	6	64	70
3,500-8,999 m ²	8	117	125
9,000 + m ²	7	125	132
Total	27	371	398
	7%	93%	

- Only 7% of businesses occupy entire building
- NABERS must deal with partial occupancy

Source: BEES Phone Survey – preliminary results.