A Comparison Of CO_2 Emission Data

=

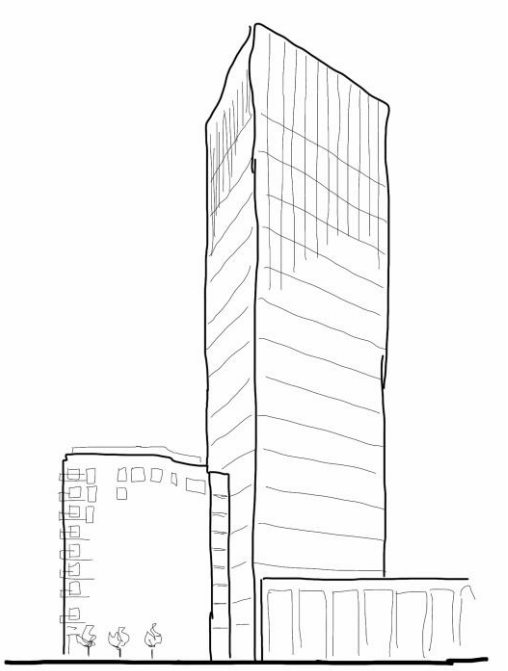
ARUP


LUMMA C
LUMMA CLR RS

$_eCO_2$ Emmissions

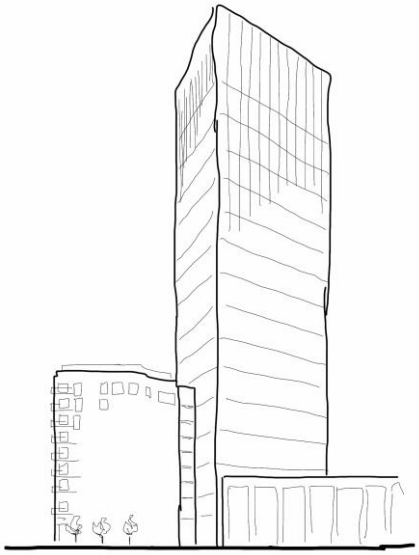
- In Construction
- In Use
- For Transport

$_eCO_2$ Emmissions

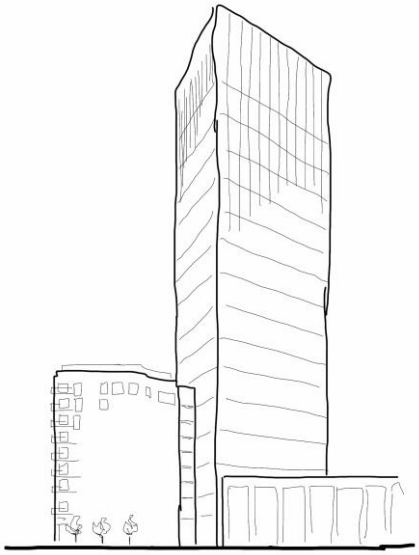


- In Construction
- In Use
- For Transport

CO_2 In Construction

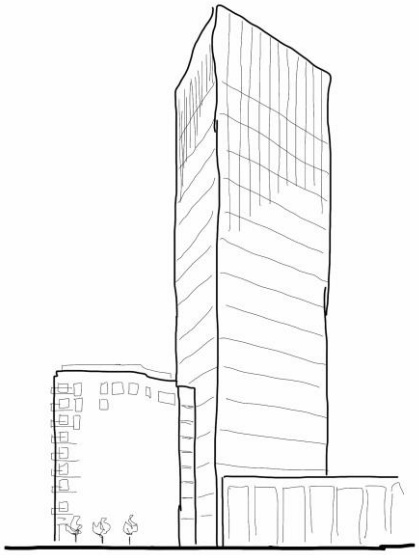


eCO_2 In Construction



- 68,000 m^2 of GEA requires 37,000 m^3 of Concrete and 4,400 t of reinforcing Steel
  ⇒ 15,355,000 kg eCO_2

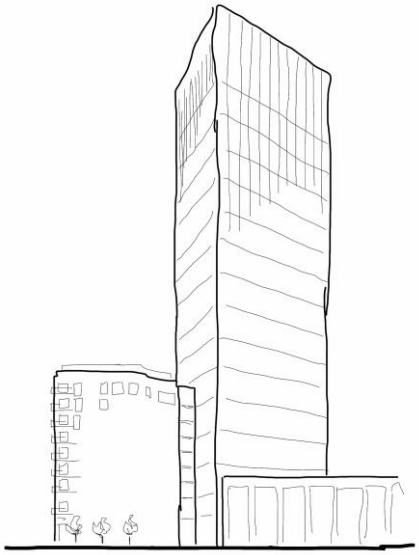
eCO_2 In Construction



- 477 apartments ⇒ 32,000 $kgeCO_2$/apt

  50yr life ⇒ **740** $kgeCO_2$/yr apt

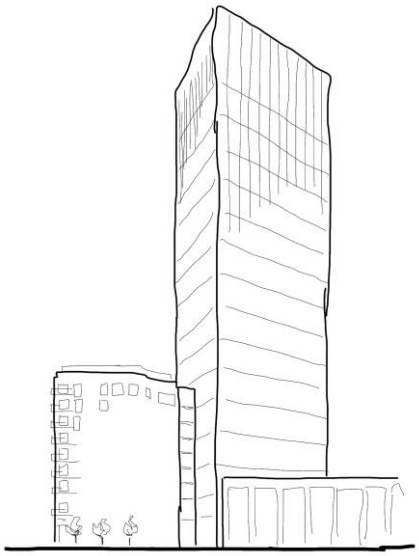
eCO_2 In Construction



- 477 apartments ⇒ 32,000 $kgeCO_2$/apt
  50yr life ⇒ **740** $kgeCO_2$/yr apt

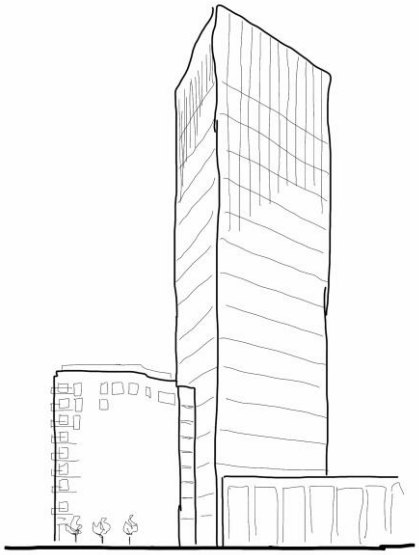
- Assume eCO_2 for whole house = eCO_2 for fitout and facade of apartment.
  = **0** $kgeCO_2$/yr house

e CO_2 IN USE



- part LI calc ⇒ **1290** $kgCO_2/yr\ apt$

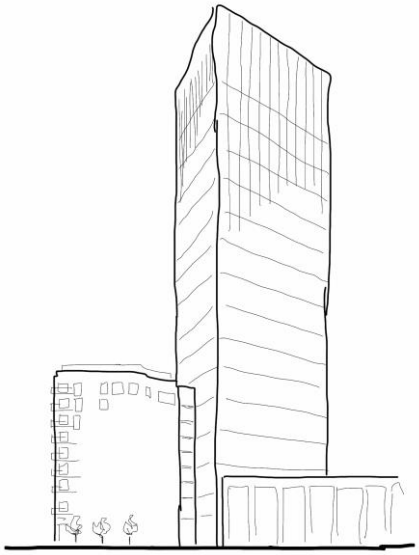
e CO_2 IN USE



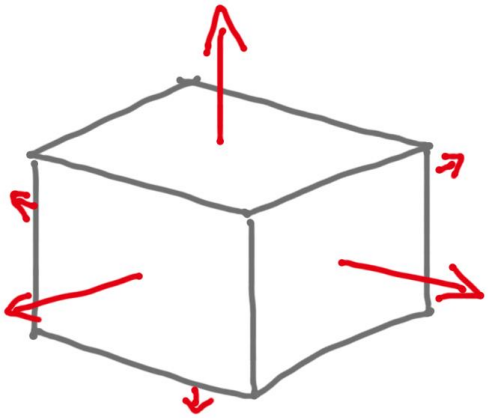
- part LI calc ⇒ **1290** $kgCO_2/yr\ apt$

- BISRIA Guide BG9 ⇒ **5270** $kgCO_2/yr\ h$

e CO_2 IN USE : Why such a marked difference?

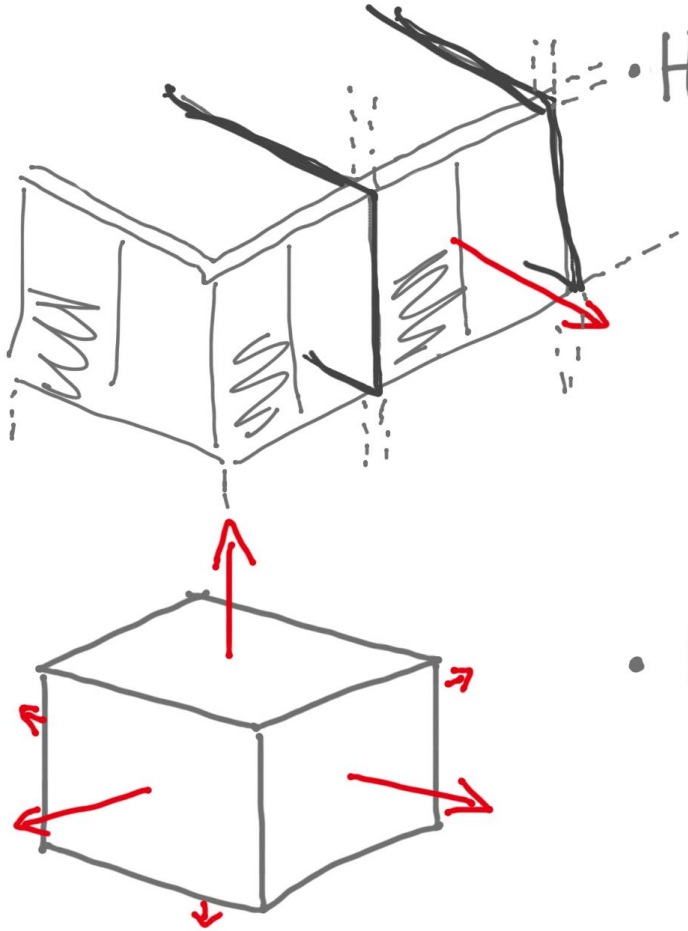


e CO_2 IN USE : Why such a marked difference?



- Heat loss through 6 Faces

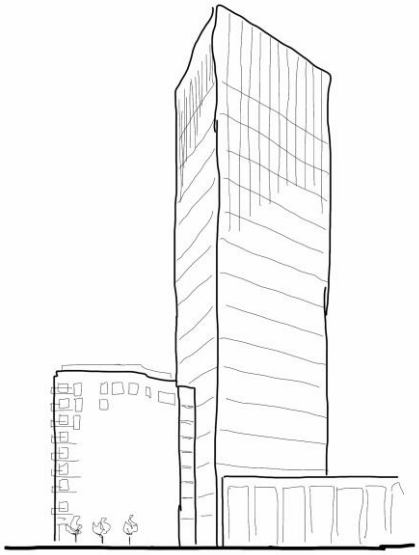
CO_2 IN USE : Why such a marked difference?



- Heat loss through, 1·5 faces

- Heat loss through 6 faces

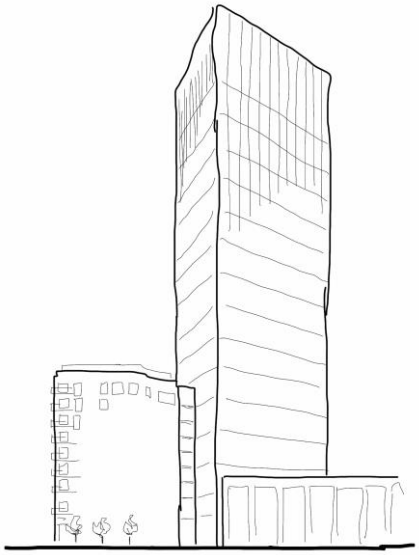
Running Total



- 740 + 1290
  = 2030 $kgCO_2/yr$ apt

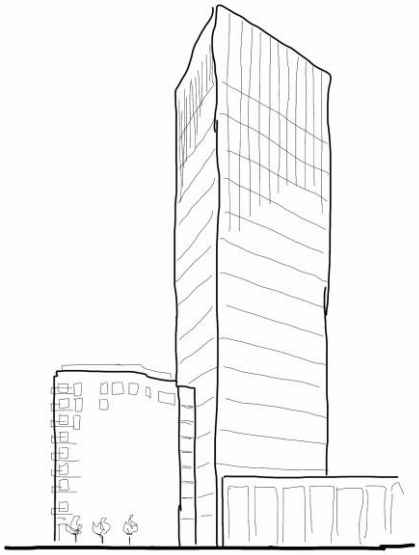
- 5270 $kgCO_2/yr$ h

CO_2 IN USE: What about lifts?



- Modern Lift
  Regenerative braking
  LED Lighting
  = 30 kWh/yr apt ⇒ **15** kg CO_2/yr apt

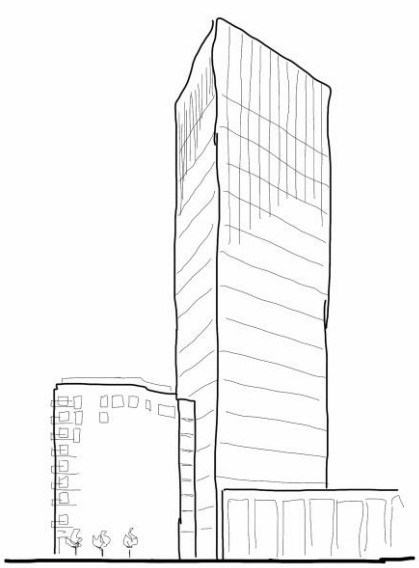
Running Total



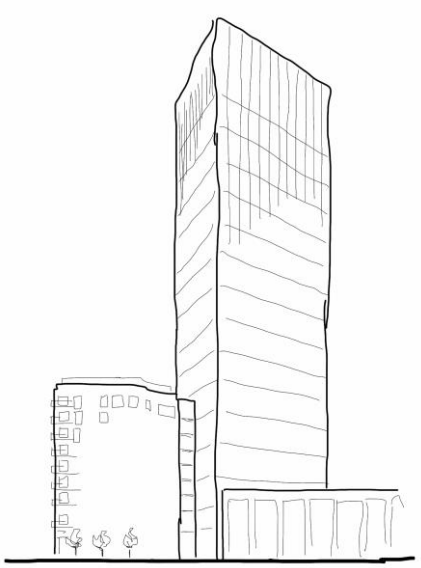
- 740 + 1290 + 15
  = 2045 $kgCO_2/yr$ apt

- 5270 $kgCO_2/yr$ h

CO_2 For Transport

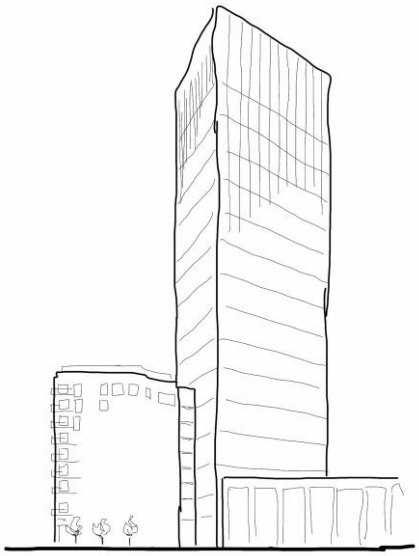


CO_2 For Transport



- Part of a dense city
  4 mile tube journey
  5 days/wk 48 wks/yr
  ⇒ **200** $kgCO_2/yr$ apt

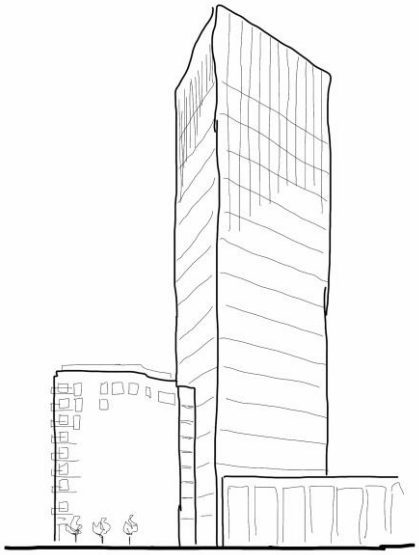
CO_2 For Transport



- Part of a dense city
  4 mile tube journey
  5 days/wk 48 wks/yr
  ⇒ **200** kg CO_2/yr apt

- Say: 4 mile tube journey = 200kg
  50 mile train journey = 1830kg
  8 mile car to station 1360kg
  = **3390** kg CO_2/yr h

Overall Total



- 740 + 1290 + 15 + 200

= **2245** $kgCO_2/yr$ apt

- 5270 + 3390

= **8660** $kgCO_2/yr$ h

Conlusion

Tall buildings, as a part of well designed, dense cities, form an important weapon in our fight against global warming.

Steve McKechnie
11th Feb 2015