

***sustainable cements build  
sustainable cities***



***earth  
air  
water  
fire***



## **cement**



***9 million tonnes cement production***



***15 million tonnes raw materials consumed***



***4 million tonnes coal eq consumed***



***1500 million litres water consumed***



***6.5 million tonnes carbon dioxide emitted***



## **CO2 emissions**



***48 million tonnes carbon dioxide***



***6.5 million tonnes carbon dioxide***



***80 million tonnes carbon dioxide***

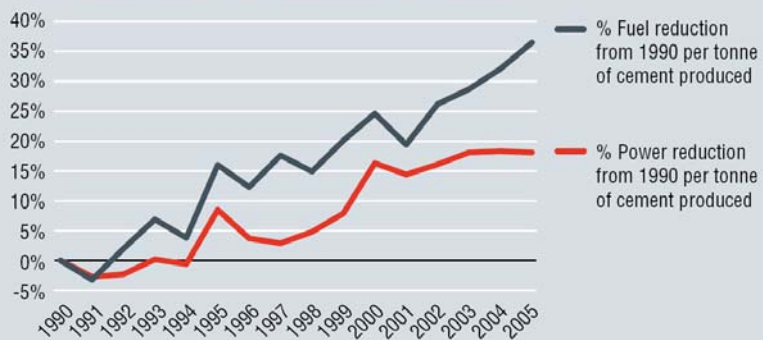


$$A_{x_B} = C$$



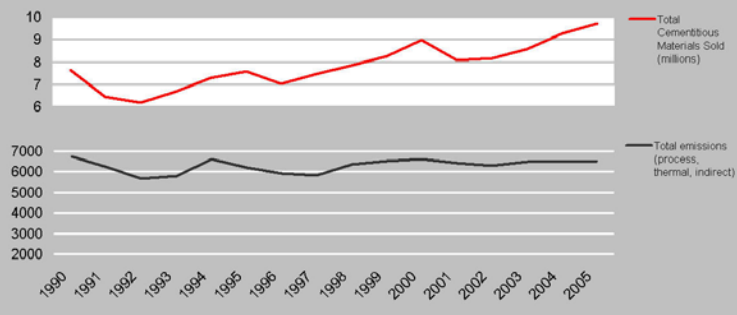
## cement

### Fuel and power efficiency gains

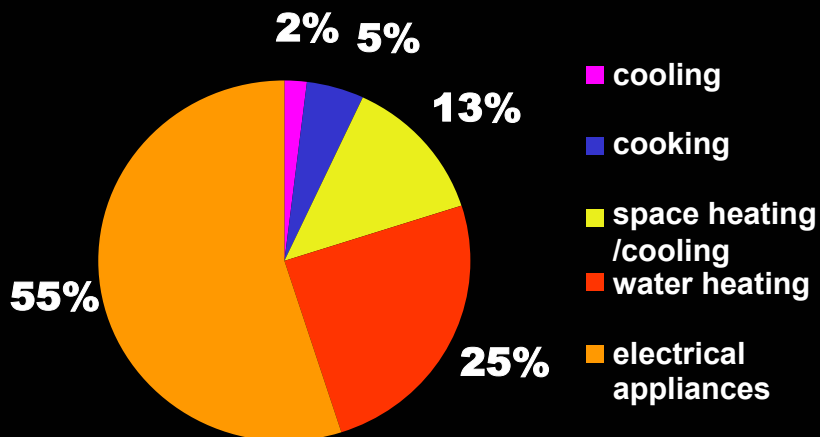


## cement

### Cementitious materials sales and CO2 emissions



### CO2 emissions from residential buildings



Source: AGO - Australian Residential Building Sector Greenhouse Gas Emissions 1990-2010

***sustainable design***

***industrial ecology***

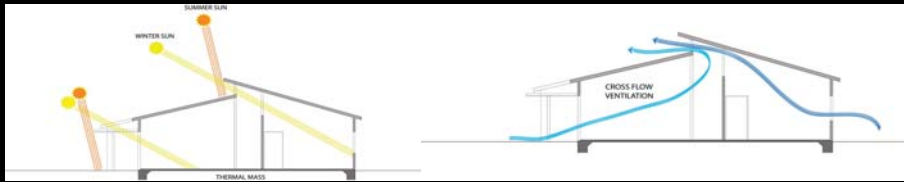


**sustainable design**

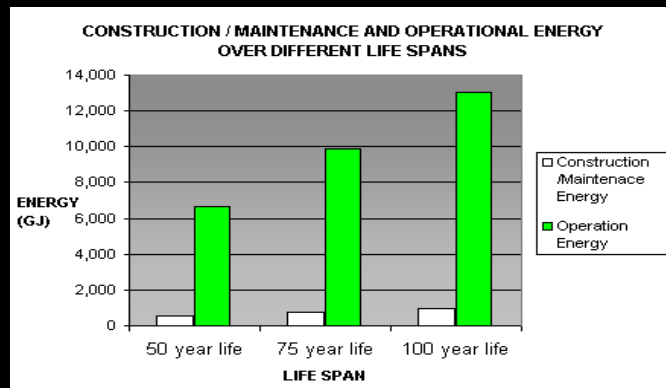
**2 x 2 x 2**



## sustainable design



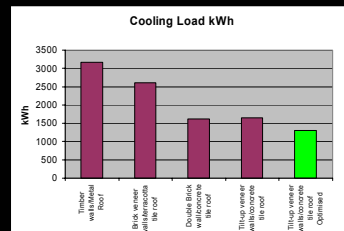
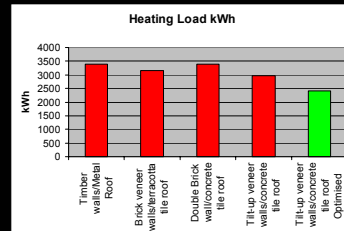
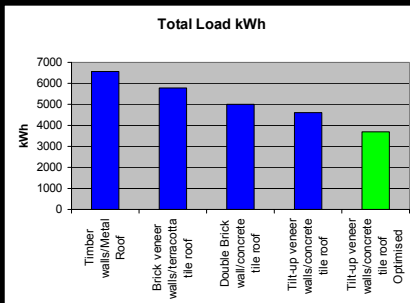
## sustainable design



## sustainable design



## sustainable design



**industrial ecology**



***wood waste***



***biosolids***



***spent solvents and resins***



***artificial gypsum***



***tallow residue***



***spent cell liners from aluminium production***



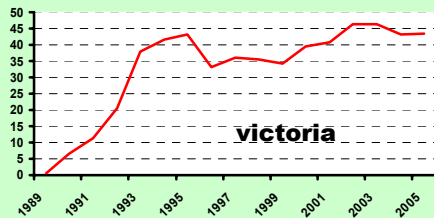
**industrial ecology**



# industrial ecology



Alternative fuel use as a percentage of total thermal energy use



Alternative fuel use as a percentage of total thermal energy use



***sustainability  
through  
design  
innovation  
collective & individual action***

