

# Environmental Data

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# Outline

Why we collect environmental data

Tools for data management

Analysis of data collected through AIMS

Data is collected to:

Raise awareness

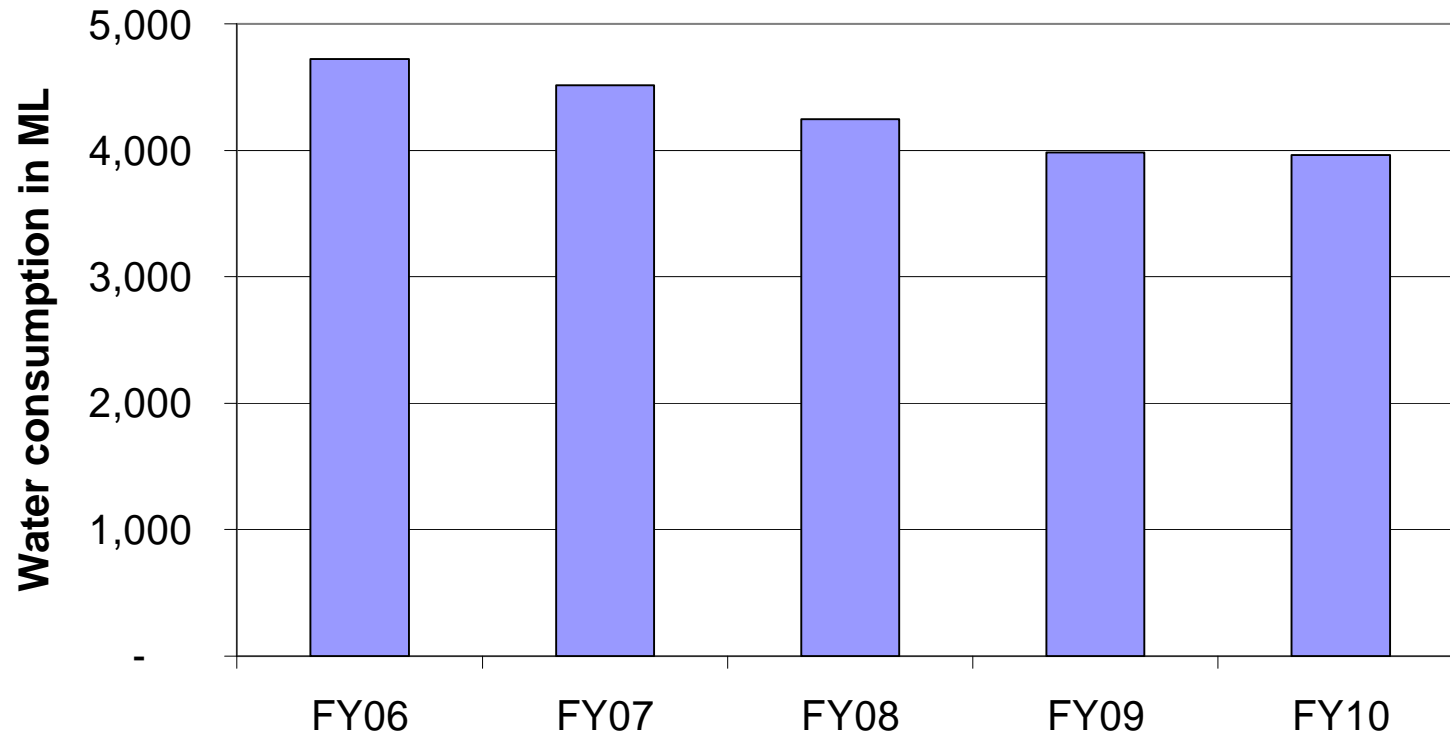
Manage risk

Comply with legislation

Improve performance

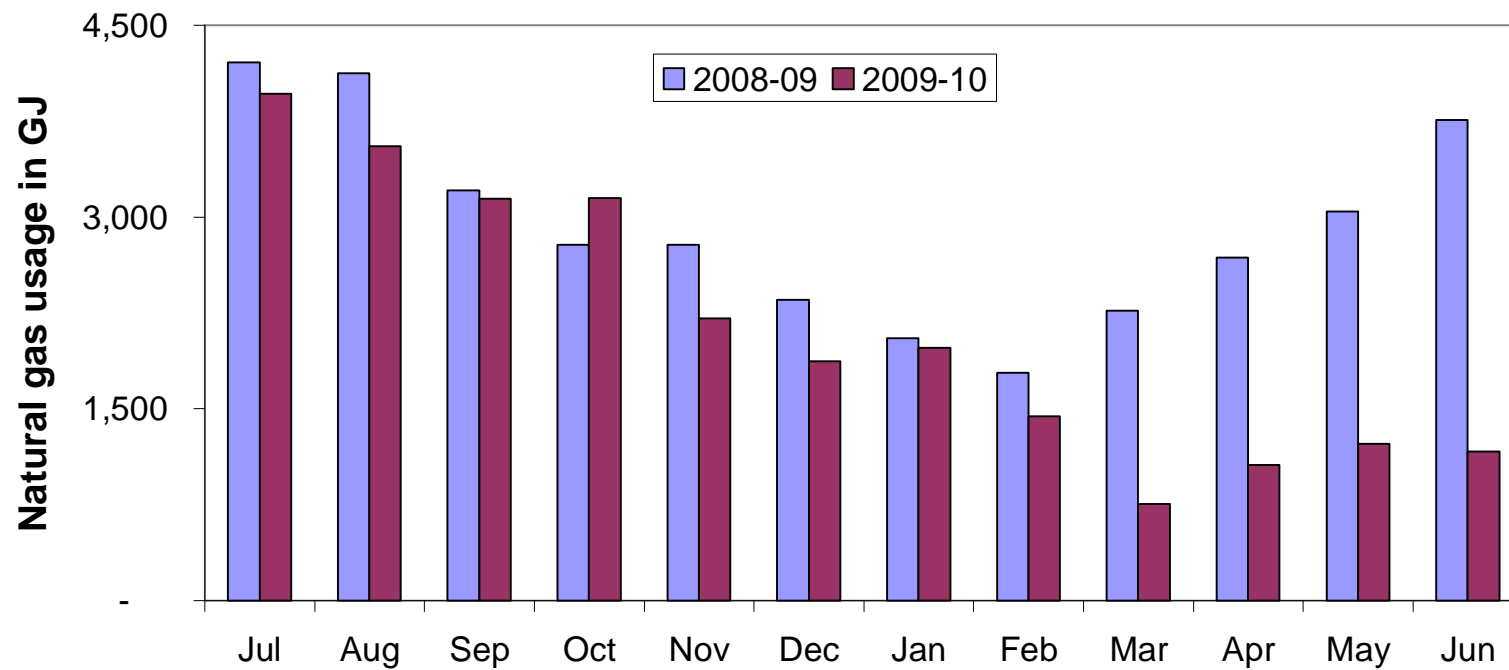
# Example of reduced environmental impact

## Whole-of-portfolio water consumption



# Example of reduced environmental impact

## Boiler plant optimisation project impact on natural gas consumption



# Environmental Programs

<b>Program</b>	<b>Program full name</b>	<b>Env. data in scope</b>	<b>Reporting entity</b>	<b>Number of involved health services</b>
EMP (From 2011/12)	Environmental Management Plan	E, Water, Waste, T, P, GHG	Health services	All
EREP	Environmental Resource Efficiency Plan	E, Water, Waste	Health services	5-10
GSET	Government Sustainability Energy Target	E	DH	All
NGER	National Greenhouse and Energy Reporting	E, GHG	Health services	5-10
WaterMAP	Water Management Action Plans	Water	Health services	50+

Legend: E = Energy, GHG = Greenhouse Gases Emissions, P = Procurement, T = Transport

## Data management tools

### Currently used tools:

AIMS (Agency Information Management System)

EDAM (Energy Data and Management)

Custom designed databases e.g. MS Access for NGER

Spreadsheets

[www.health.vic.gov.au](http://www.health.vic.gov.au)

## Agency Information Management System

### Energy and Environment Reporting Energy Consumption

Agency: 99999 A Sample Agency

Agency Floor Area: 118257

Period: 1 July

Year: 2010/11

Print

Validate

Save

Submit

Completed



#### Electricity Data

#### Natural Gas Data

#### LPG Data

#### Briquettes Data

#### Diesel Data

#### Other Fuel Data

#### Cogeneration Data

#### Water Data

#### Recycled Water

#### Greenpower

#### Comments

Peak in kWh	<input type="text" value="1,000"/>
Megajoules	<input type="text" value="0"/>
Litres	<input type="text" value="0"/>
Tonnes	<input type="text" value="0"/>
Litres	<input type="text" value="0"/>
Megajoules	<input type="text" value="0"/>
Steam (Peak) in Tonnes	<input type="text" value="0"/>
KiloLitres	<input type="text" value="0"/>
KiloLitres	<input type="text" value="0"/>
Peak in kWh	<input type="text" value="0"/>

		Cost	
Off Peak in kWh	<input type="text" value="1"/>	\$	<input type="text" value="60"/>
		\$	<input type="text" value="0"/>
		\$	<input type="text" value="0"/>
		\$	<input type="text" value="0"/>
		\$	<input type="text" value="0"/>
		\$	<input type="text" value="0"/>
Steam (Off Peak) in Tonnes	<input type="text" value="0"/>	\$	<input type="text" value="0"/>
		\$	<input type="text" value="0"/>
Off Peak in kWh	<input type="text" value="0"/>	\$	<input type="text" value="0"/>

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## Key Stats

Energy and water data collected from 112 reporting entities

More than 95 per cent of energy and water captured

Totals reported for 2009/10:

- Energy: consumption 4.4million GJ; cost \$70m
- Floor area = 2.45 million m<sup>2</sup>
- Water: consumption 4million kL; cost \$9mil
- Electricity: consumption 500GWh, about 1% of Vic total

# AIMS – Summary report

Financial Year	Electricity Consumption - Peak (kWh)	Electricity Consumption - Off Peak (kWh)	Electricity Cost (\$)	Natural Gas Consumption (MJ)	Natural Gas Cost (\$)	Other fuel Consumption (MJ)	Other fuel Cost (\$)	Cogeneration Steam Consumption - Peak (Tonnes)	Cogeneration on Steam Consumption - Off Peak	Cogeneration on Steam Cost (\$)	LPG Consumption (Litres)	LPG Cost (\$)	Briquette Consumption (Tonni)	Briquette Cost (\$)	Diesel Consumption (Litres)	Diesel Cost (\$)	Water Consumption (KiloLitres)	Water Cost (\$)	Recycled Water Consumption (Litres)	Greenpower Consumption - Peak	Greenpower Consumption - Off Peak	Greenpower Cost (\$)	Agency Floor Area		
0910	1,105,589	782,411	253,632	6,563,264	67,097	0	0	0	0	0	0	0	0	0	0	0	13,860	30,356	0	0	0	0	908		
0910	162,968	76,141	46,170	0	0	0	0	0	0	0	39,001	27,948	0	0	0	3,447	6,576	0	0	0	0	0	2393		
0910	1,223,396	941,110	264,491	12,503,694	74,668	0	0	0	0	0	50,620	28,326	0	0	0	0	15,219	19,590	0	0	0	0	912E		
0910	859,597	841,198	231,415	0	0	0	0	0	0	0	235,454	118,300	0	0	0	0	15,396	31,809	0	0	0	0	1153C		
0910	1,537,468	1,006,555	335,617	19,881,000	119,372	0	0	0	0	0	0	0	0	0	0	0	24,073	40,771	5,040	0	0	0	18,31E		
0910	419,096	352,809	88,081	0	0	0	0	0	0	0	37,545	22,648	0	0	600	754	5,687	5,713	0	0	0	0	323C		
0910	5,631,530	5,064,082	986,547	49,131,000	239,724	0	0	0	0	0	0	0	0	0	5,837	5,933	61,233	172,029	102	0	0	0	4588E		
0910	884,120	649,877	221,003	5,394,630	82,174	0	0	0	0	0	91,080	42,381	0	0	0	0	11,093	13,392	0	0	0	0	828C		
0910	4,957,778	4,013,571	990,855	42,034,375	247,881	0	0	0	0	0	94,211	51,878	0	0	0	0	98,995	147,660	4	0	0	0	32974		
0910	253,004	144,501	36,230	1,407,840	13,570	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	197E		
0910	587,946	423,813	173,591	7,094,705	62,323	0	0	0	0	0	98,863	80,156	0	0	0	0	11,943	22,831	0	0	0	0	8597		
0910	253,137	197,807	32,752	0	0	0	0	0	0	0	93,294	65,160	0	0	0	0	4,938	7,937	0	0	0	0	148C		
0910	193,533	166,706	50,988	0	0	0	0	0	0	0	101,855	56,081	0	0	0	0	4,173	16,098	0	0	0	0	462		
0910	160,672	125,736	39,747	0	0	0	0	0	0	0	70,303	35,865	0	0	0	0	4,901	10,715	0	0	0	0	286C		
0910	475,383	384,774	110,991	0	0	0	0	0	0	0	67,599	41,011	0	0	0	0	16,121	9,232	0	0	0	0	5,84E		
0910	419,778	324,000	108,658	6,814,000	34,775	0	0	0	0	0	0	0	0	0	0	0	8,019	16,507	0	0	0	0	941E		
0910	3,008,430	2,267,056	539,215	37,965,000	173,185	0	0	0	0	0	0	0	0	0	0	0	38,000	122,179	0	0	0	0	3289		
0910	330,182	270,585	75,809	0	0	0	0	0	0	0	139,662	110,640	0	0	0	0	6,355	9,725	0	0	0	0	548C		
0910	829,470	615,264	240,014	7,519,780	45,305	0	0	0	0	0	0	0	0	0	0	0	13,730	25,383	0	0	0	0	654E		
0910	429,281	302,538	91,880	5,827,000	32,718	0	0	0	0	0	0	0	0	0	150	187	4,067	7,610	1,236	0	0	0	508E		
0910	3,374,764	2,880,261	641,059	25,944,000	120,148	0	0	0	0	0	0	0	0	0	0	0	45,545	178,099	0	0	0	0	2018E		
0910	190,589	144,950	37,036	0	0	0	0	0	0	0	41,643	27,617	0	0	0	0	4,448	6,850	0	0	0	0	251E		
0910	106,672	95,057	34,855	0	0	0	0	0	0	0	15,651	38,119	0	0	0	0	1,986	5,417	0	0	0	0	225C		
0910	444,006	312,242	104,640	0	0	0	0	0	0	0	56,237	45,953	0	0	0	0	21,217	24,038	0	0	0	0	784E		
0809	79,690	59,670	23,767	0	0	0	0	0	0	0	9,839	9,662	0	0	0	0	1,968	1,598	0	0	0	0	1,10E		
0809	478,925	427,274	127,252	0	0	0	0	0	0	0	0	0	0	0	0	0	2,123	19,044	0	0	0	0	41E		
0809	3,880,546	2,682,563	778,880	28,495,000	131,940	0	0	0	0	0	0	0	0	0	0	0	2,008	8,428	38,380	0	0	0	480E		
0809	968,958	671,045	117,255	82,748,000	50,634	0	0	0	0	0	88,918	43,029	0	0	0	0	11,456	10,059	0	0	0	0	50E		
0809	206,078	890,235	96,840	0	0	0	0	0	0	0	43,024	23,403	0	0	0	0	3,376	8,094	0	0	0	0	3,39E		
0809	6,675,594	0	605,288	8,485,000	23,506	0	0	0	0	0	0	0	0	0	0	0	24,542	24,955	0	0	0	0	281E		
0809	2,224,296	2,047,698	529,096	83,240,000	83,346	0	0	0	0	0	0	0	0	0	0	0	20,008	44,876	0	0	0	0	1009E		
0809	13,094,318	10,236,452	1,802,387	97,531,000	449,519	0	0	0	0	0	0	0	0	0	0	0	12,262	17,802	94,839	435,538	0	0	0	969E	
0809	2,785,455	1,809,216	452,889	30,347,000	91,677	0	0	0	0	0	0	0	0	0	0	0	2,226	2,972	33,874	105,217	840	0	0	280E	
0809	2,273,802	1,860,093	485,921	85,863,000	123,158	0	0	0	0	0	0	0	0	0	0	0	108	23,454	64,621	0	0	0	0	3294	
0809	323,732	204,188	95,092	6,488,188	99,219	0	0	0	0	0	0	0	0	0	0	0	0	9,339	19,185	4,748	0	0	0	31E	
0809	1,864,652	909,634	268,983	25,667,883	89,552	0	0	0	0	0	0	0	0	0	0	0	0	21,874	54,086	0	0	0	0	218E	
0809	253,028	228,216	68,880	0	0	0	0	0	0	0	93,905	56,007	0	0	0	0	5,078	5,094	0	0	0	0	30E		
0809	2,860,638	2,188,173	609,523	25,860,957	105,163	0	0	0	0	0	0	0	0	0	0	0	0	49,513	83,588	0	0	0	0	249E	
0809	540,853	400,575	158,980	898,518	11,694	0	0	0	0	0	26,247	24,445	0	0	0	0	5,882	12,381	0	0	0	0	47E		
0809	115,468	118,918	33,478	0	0	0	0	0	0	0	50,558	31,056	0	0	0	0	1,567	10,985	0	0	0	0	83E		
0809	284,296	163,083	78,790	0	0	0	0	0	0	0	10,129	75,688	0	0	0	0	6,596	23,099	0	0	0	0	48E		
0807	122,105	92,087	30,251	0	0	0	0	0	0	0	52,144	24,254	0	0	0	0	3,088	2,801	0	0	0	0	110E		
0807	298,678	61,229	63,257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,229	8,911	0	0	0	0	15E	
0807	12,815,448	911,096	212,072	5,444,000	26,485	0	0	0	0	0	0	0	0	0	0	0	198	3,217	26,378	59,239	0	0	0	0	019E
0807	6,389,073	6,404,578	1,406,322	30,617,000	85,240	0	0	0	0	0	0	0	0	0	0	0	0	42,378	118,585	0	0	0	0	288E	
0807	1,071,438	967,754	262,342	8,950,000	50,895	0	0	0	0	0	0	0	0	0	0	0	0	5,338	16,182	0	0	0	0	93E	
0708	898,356	825,738	32,690	2,272,164	20,449	0	0	0	0	0	0	0	0	0	0	0	0	1,873	3,301	0	0	0	0	224E	
0708	259,505	257,296	78,082	1,891,457	14,538	0	0	0	0	0	0	0	0	0	0	0	65	205	5,627	3,880	0	0	0	0	39E
0708	550,252	406,738	173,888	0	0	0	0	0	0	0	88,753	71,248	0	0	0	0	0	18,294	23,983	0	0	0	0	89E	
0708	458,448	373,472	96,947	2,720,693	23,138	0	0	0	0	0	0	0	0	0	0	0	0	5,338	4,779	0	0	0	0	107E	
0708	772,448	616,686	138,688	5,325,000	30,006	0	0	0	0	0	0	0	0	0	0	0	138	138	11,847	38,985	0	0	0	0	812E

## Whole-of-Victorian Government Environmental Data Management System

Aim is to make data more:

- Relevant
- Reliable
- Responsive

## EDMS Features

- Automatic data capture (direct from retailers; initially large suppliers)
- Standardised processes to improve accuracy
- Understand whole-of-government environmental impact
- Improved data integrity for external reporting
- Increased data granularity
- Improve accessibility
- Capture more data e.g. transport
- Reduce duplication (generate multiple reports from one data set)

## Progress to date

Intelligent Pathways appointed mid 2010

Tool being developed with data from 'early adopter' departments e.g. Department of Justice

Monthly workshops attended by health sector representatives

## Evaluation process

Health sector evaluation group

Monthly meetings/ workshops

Evaluation report

## Evaluation working group

	Number of reporting entities in AIMS	Share of portfolio energy use	Proposed number of representatives for WoVG EDMS evaluation
Local	55	10%	1
Metro	28	49%	2
Regional	6	15%	2
Specialist	12	14%	1
Sub regional	11	11%	1
<b>Total</b>	<b>112</b>	<b>100%</b>	<b>7</b>

## AIMS data

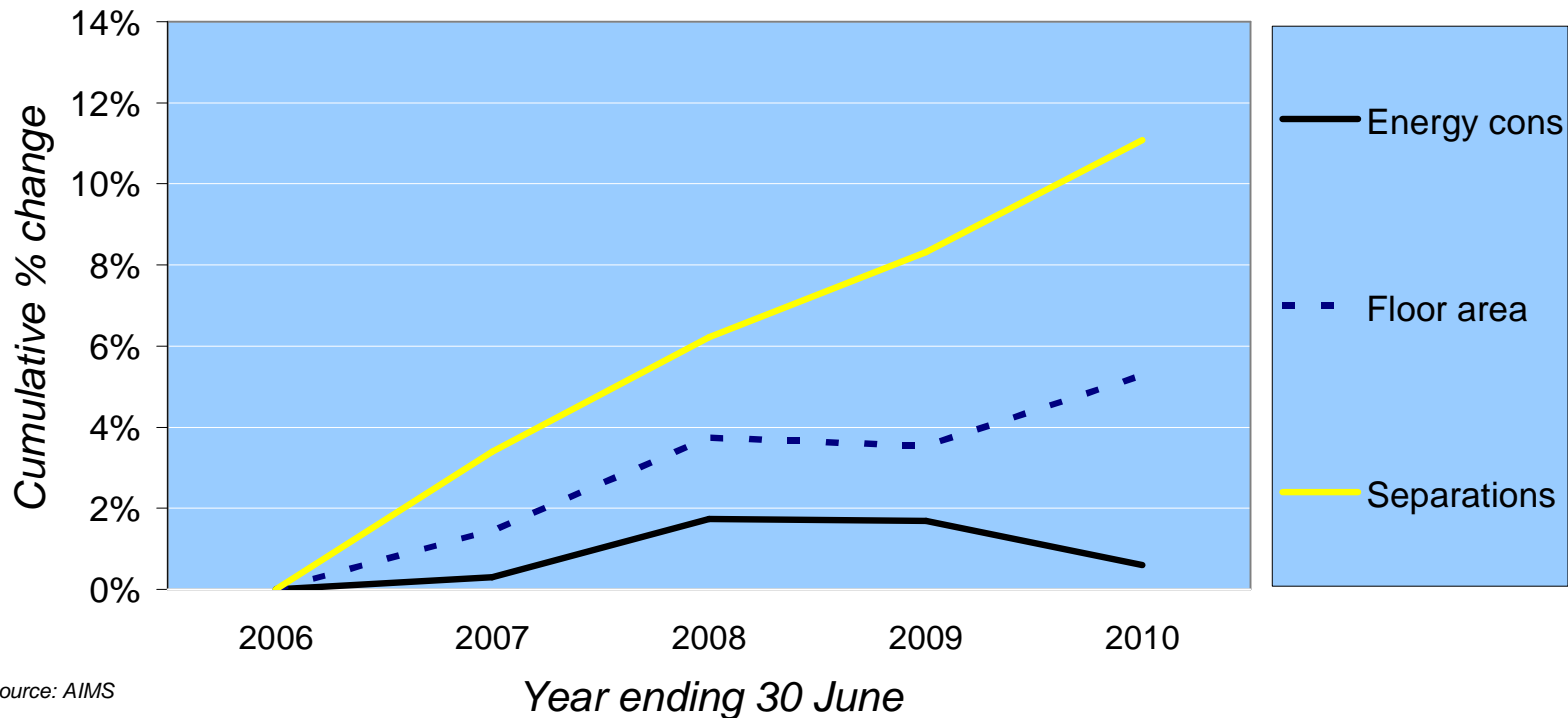
Could be used to:

- Establish trends
- Benchmark/ compare performance
- Evaluate programs/ projects
- Compare cost of energy



# Energy efficiency is improving

**Whole-of-portfolio energy consumption relative to floor area and separations - change since 2005-06**



Source: AIMS

# Progress towards GSET

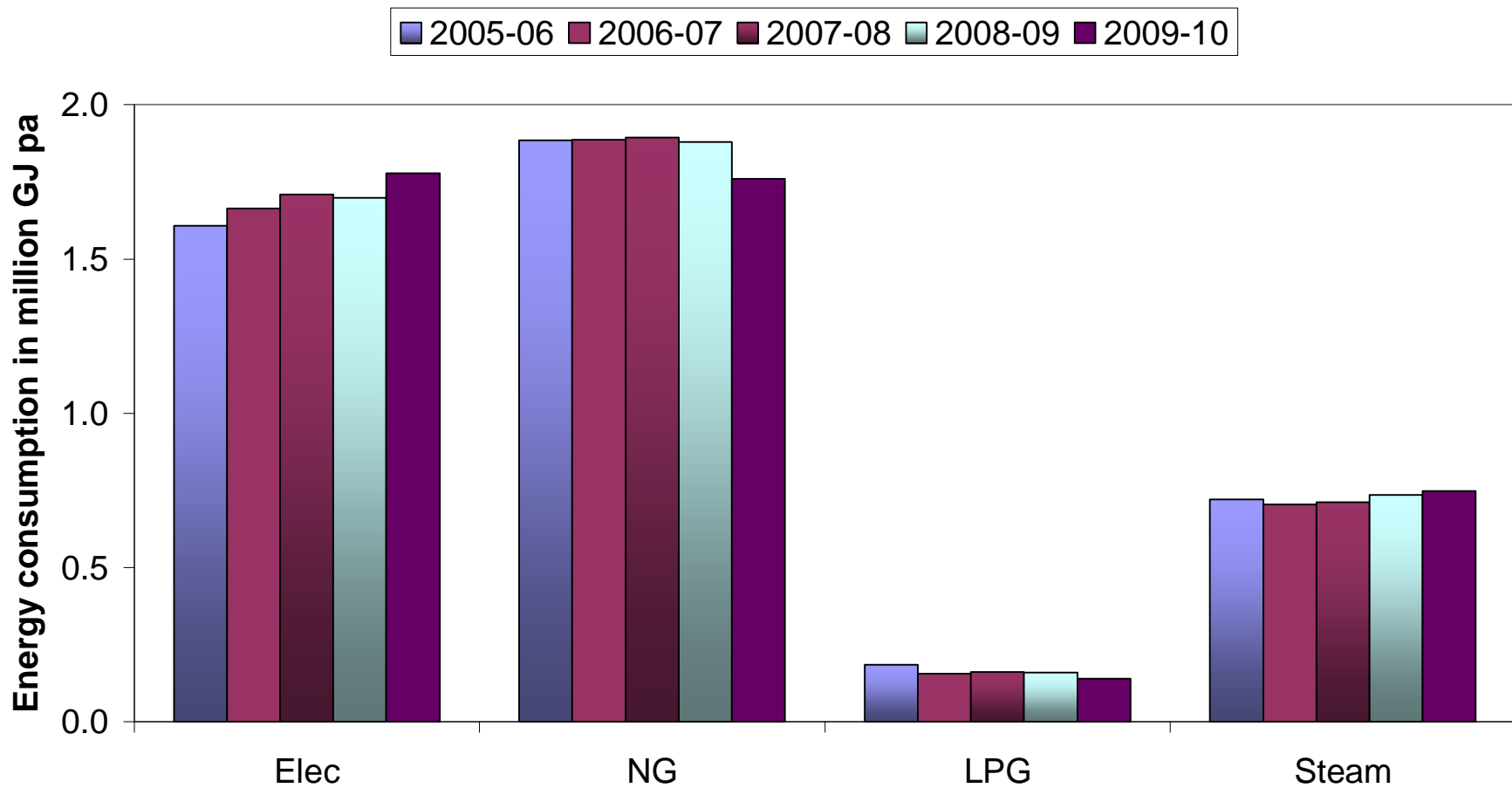
## Whole-of-portfolio data for GSET reporting

Energy related data	2006-07	2009-10	Rate of change
Energy consumption (,000 GJ)	4,417	4,430	0.30%
Floor Area (,000 m <sup>2</sup> )	2,367	2,456	3.77%
Separations (,000)	1,356	1,457	7.44%
<b>Energy intensity measures</b>			
GJ/m <sup>2</sup>	1.87	1.80	-3.35%
GJ/separation	3.26	3.04	-6.65%

The Government Sustainability Energy Target is 5 per cent improvement in energy efficiency by 2010-11 on 2006-07 levels

# Energy mix is changing

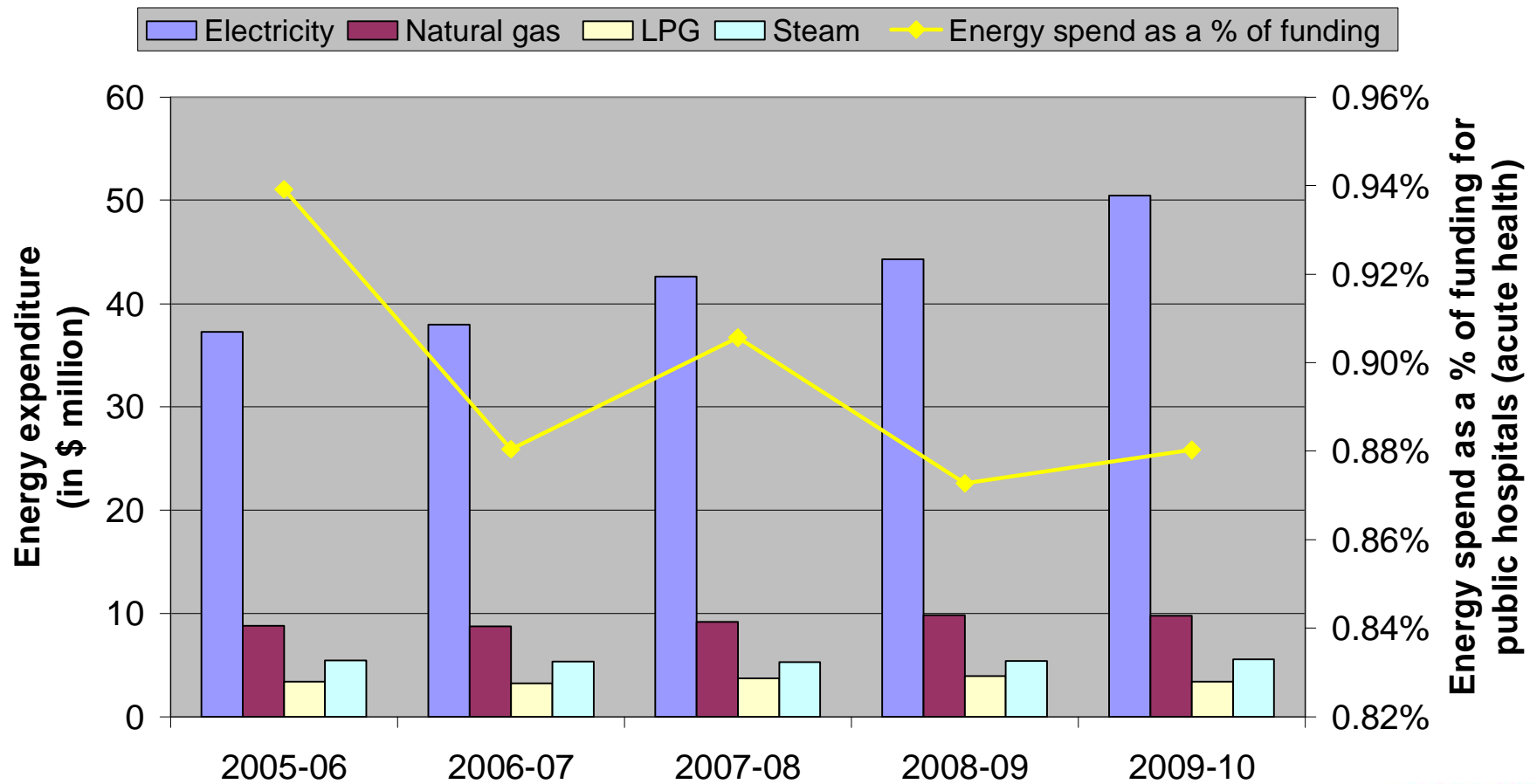
## Whole-of-portfolio energy consumption (by fuel)



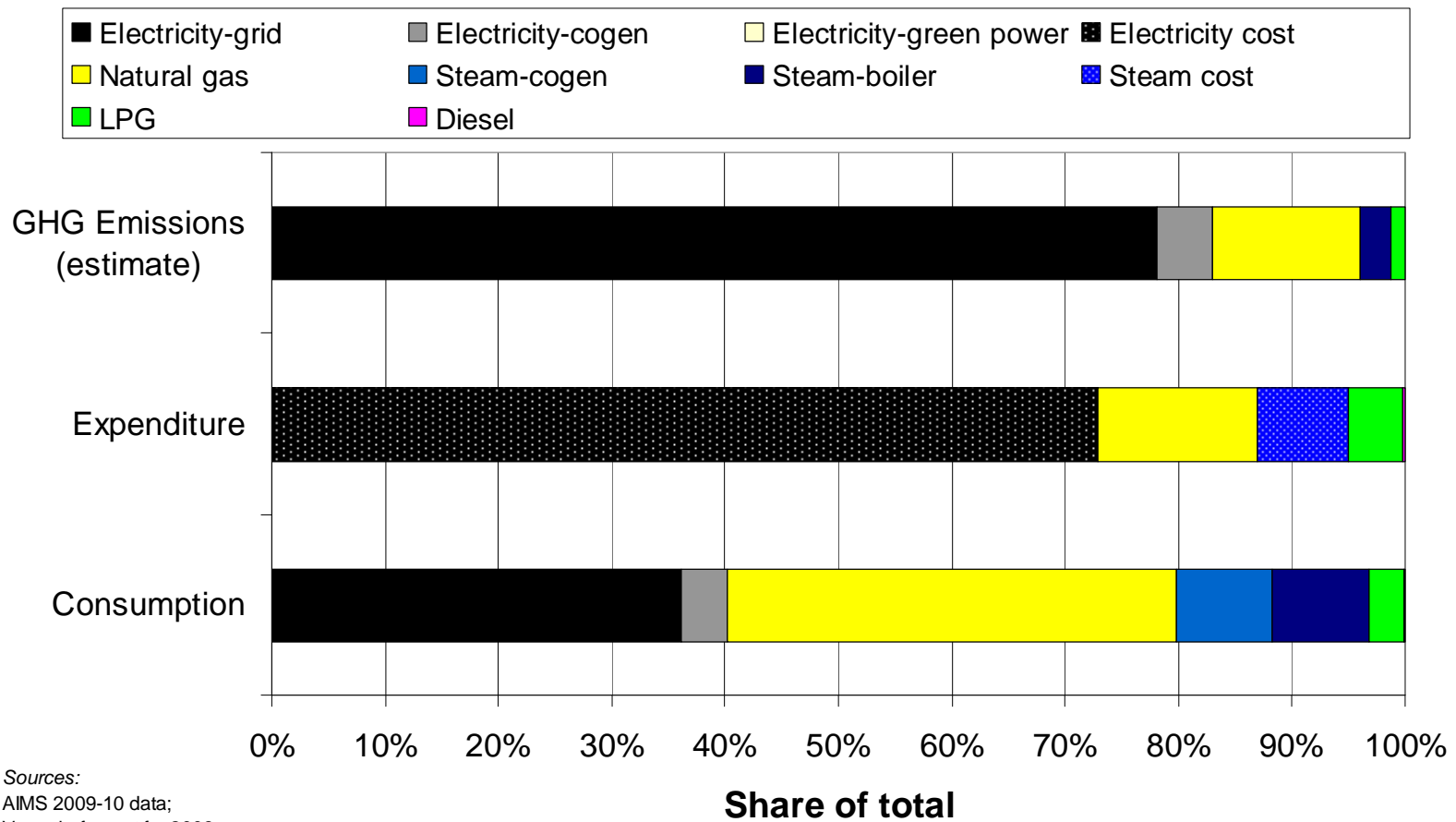
# Energy expenditure

## Whole-of-portfolio energy expenditure

Source: AIMS and DH Your Hospitals 2009-10 Report



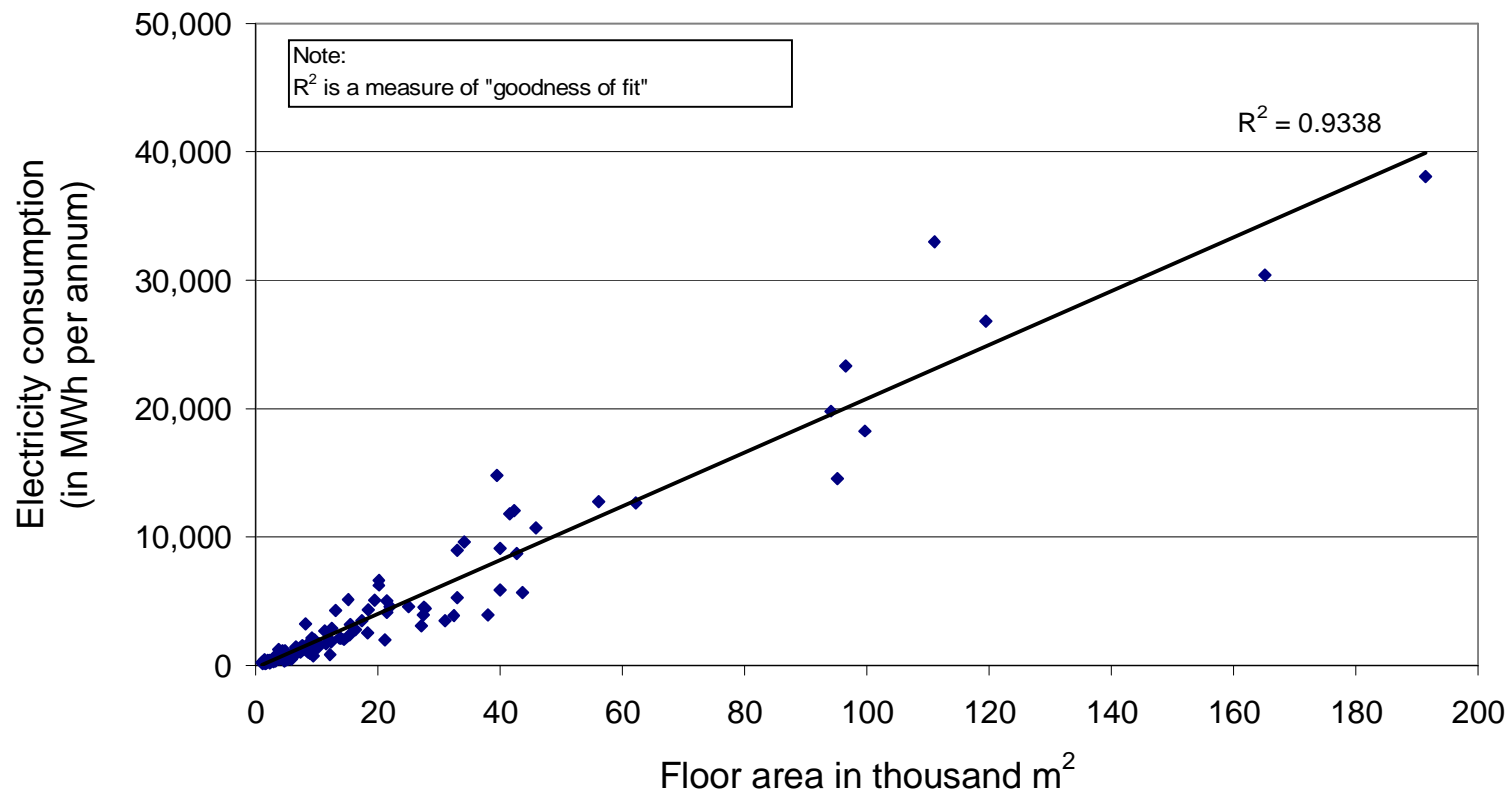
## Whole-of-portfolio energy mix



Sources:  
 AIMS 2009-10 data;  
 Varnsdorf report for 2008

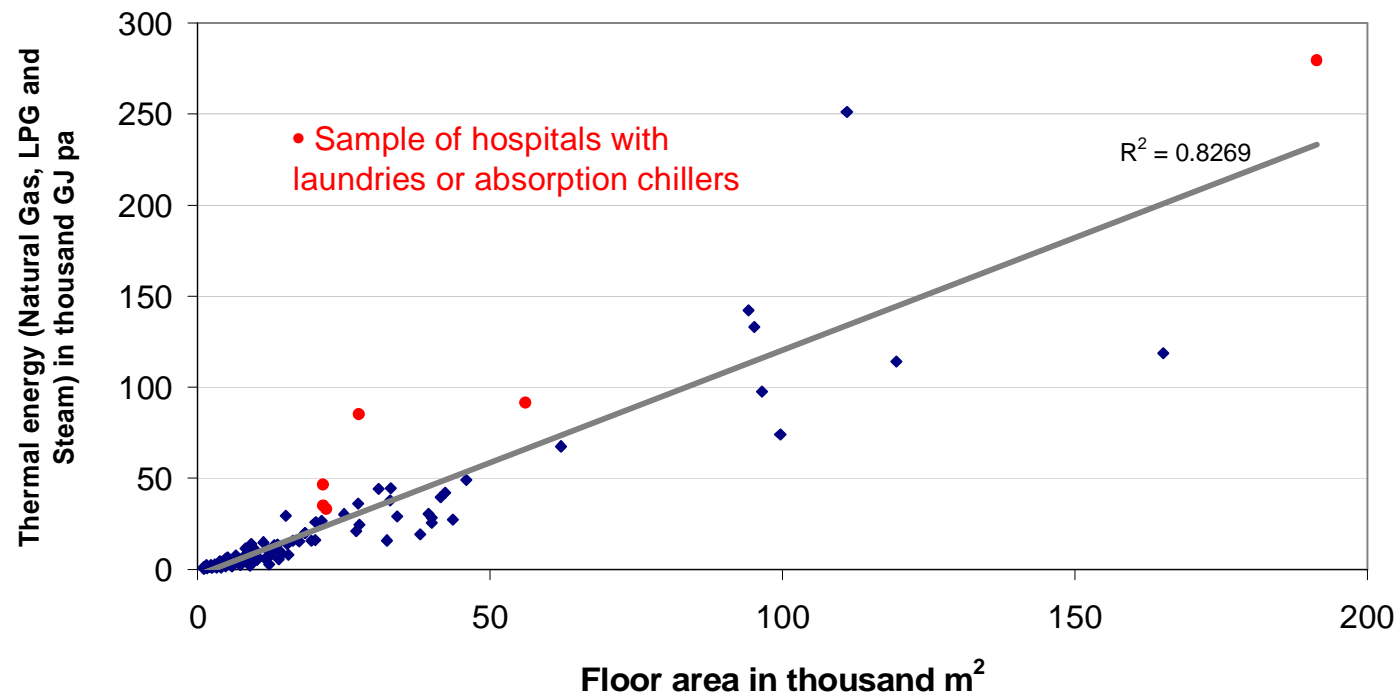
# Floor area as a performance indicator

## Electricity consumption vs floor area (2009-10 data for hospitals reporting into AIMS)



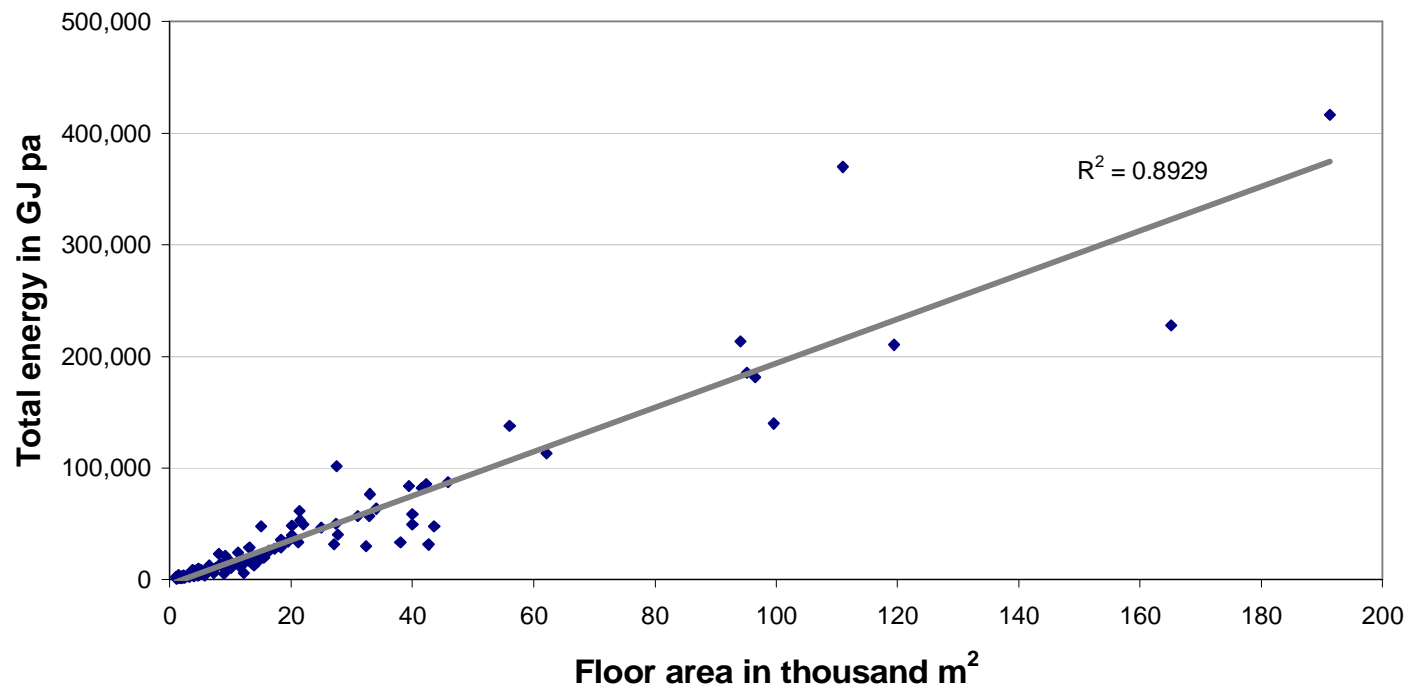
# Floor area as a performance indicator

**Thermal energy consumption vs floor area  
(2009-10 data for hospitals reporting into AIMS)**



# Floor area as a performance indicator

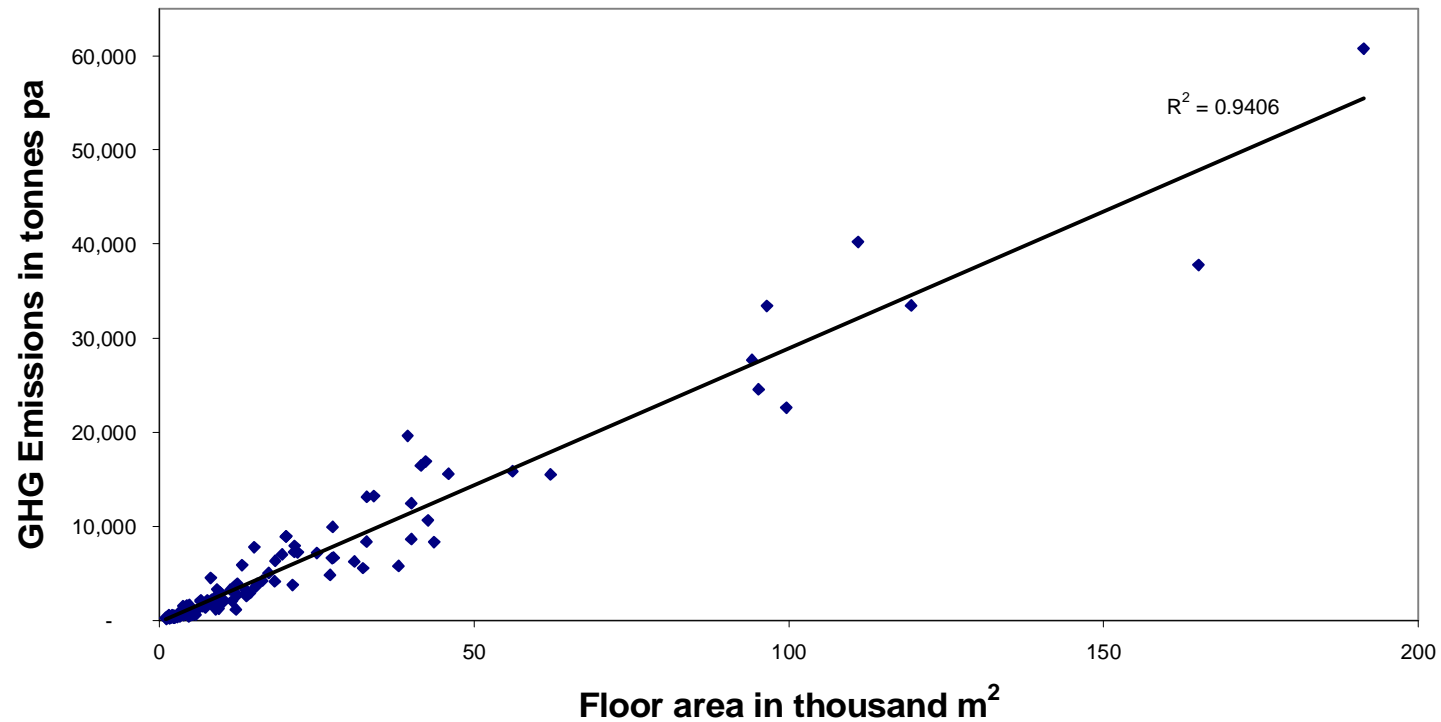
**Total energy consumption vs floor area  
(2009-10 data for hospitals reporting into AIMS )**





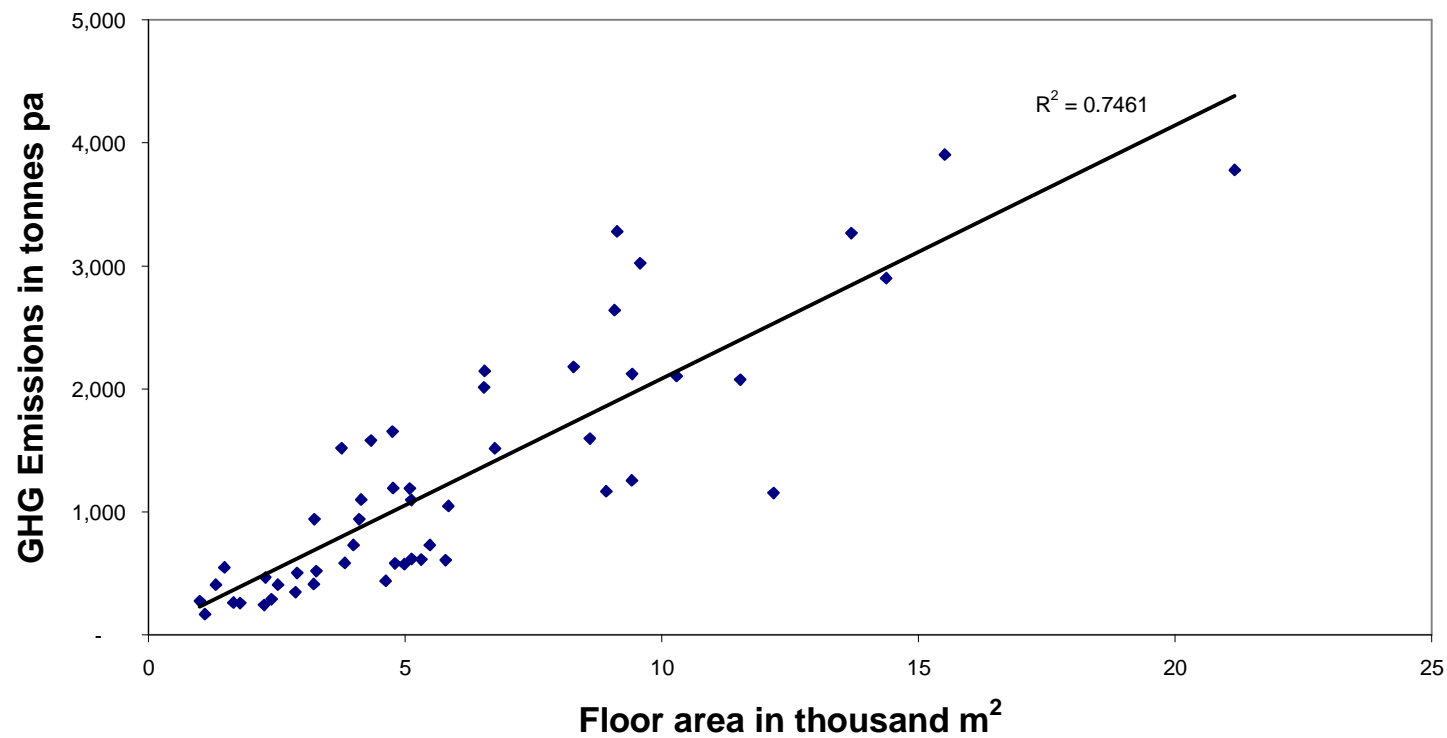
# Floor area as a performance indicator

**Greenhouse gases emissions (estimated) vs floor area  
(2009-10 data for hospitals reporting into AIMS)**



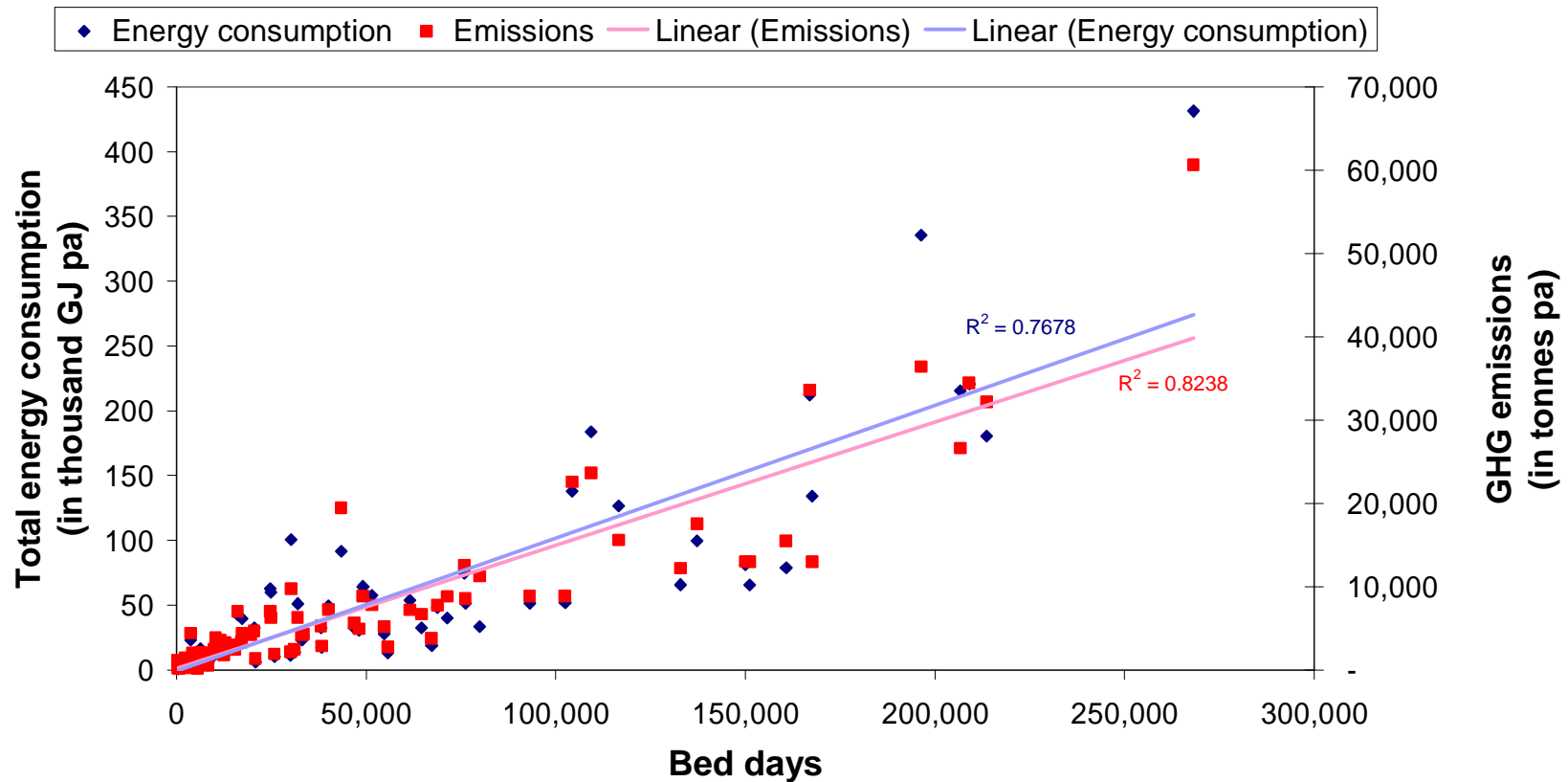
# Floor area as a performance indicator

**Greenhouse gases emissions (estimated) vs floor area  
(2009-10 data for **local** hospitals reporting into AIMS)**



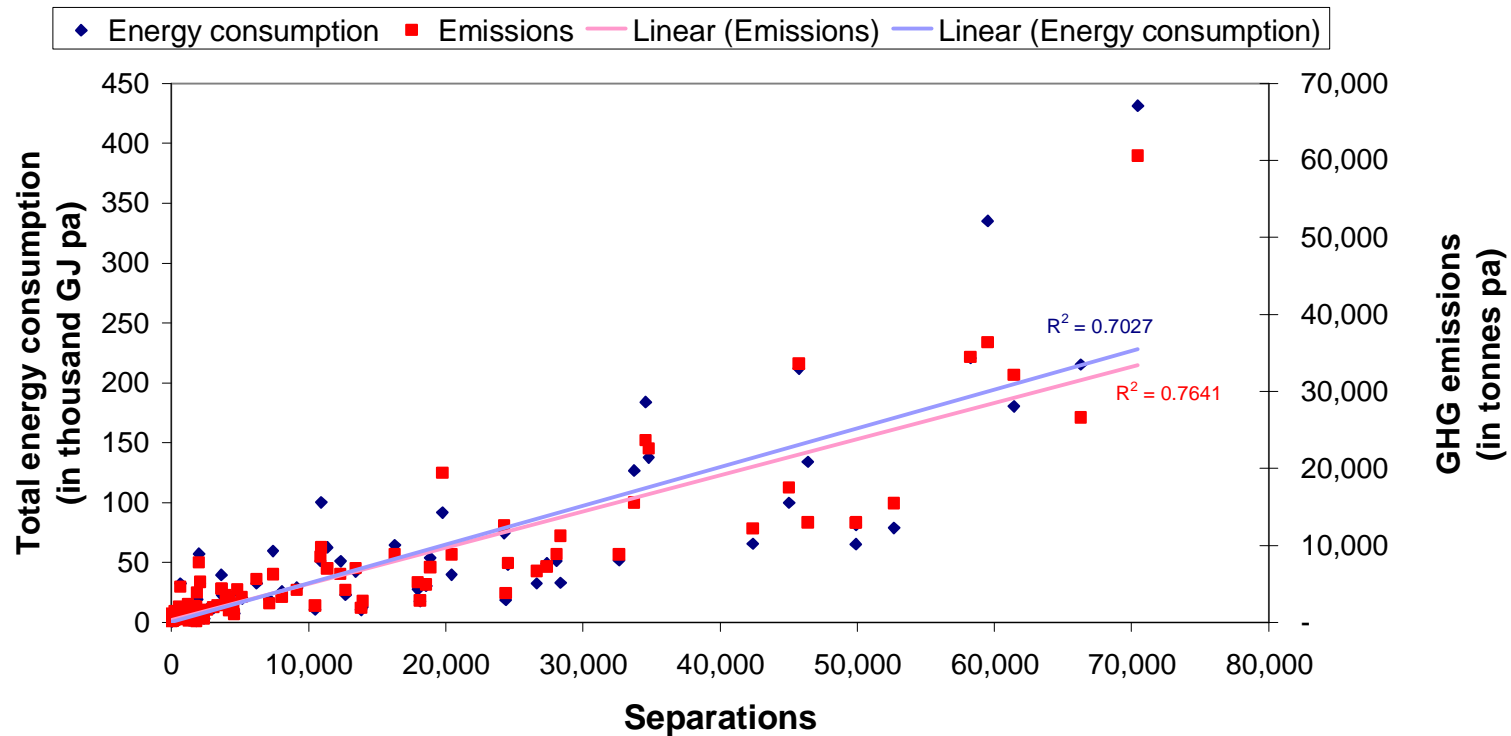
# Bed days as a performance indicator

**Energy consumption and emissions vs bed days  
(2008-09 data for hospitals reporting into AIMS)**

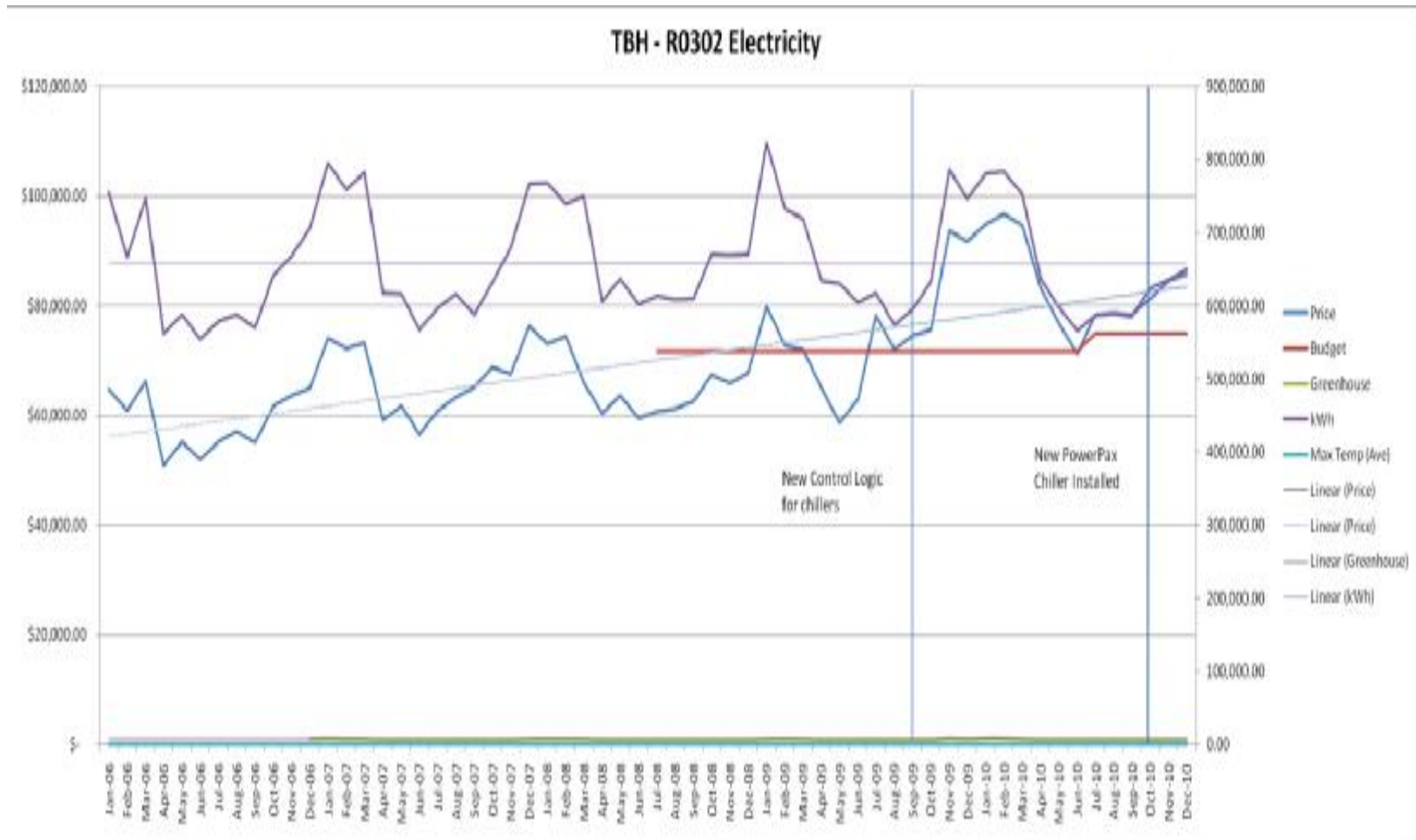


# Separations as a performance indicator

**Energy consumption and emissions vs separations  
(2008-09 data for hospitals reporting into AIMS)**

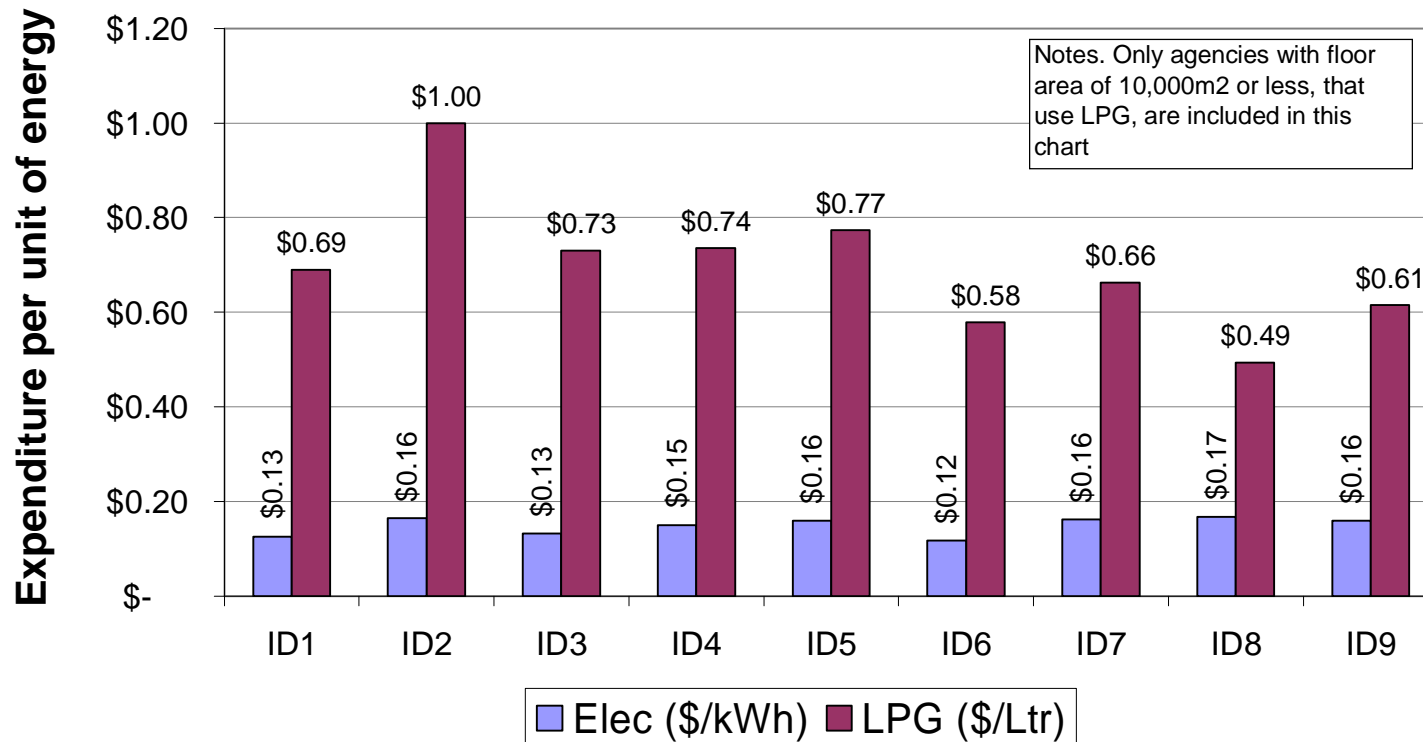


# Example of detail analysis at Bendigo Hospital



# Example of energy cost comparison

**Energy expenditure of Loddon Mallee health services (AIMS data for 2008-09)**



## Next steps

### Identify and quantify drivers that influence trends

For example

- Replacement of evaporative coolers with refrigeration systems
- Replacement of cooling towers with air coolers
- Laundries closure
- Energy efficiency initiatives e.g. boiler optimisation
- Increased used of medical equipment
- Other ????

## Next steps

Identify practices/ initiatives that reduce environmental impact

For examples

- Building Management Systems
- Preventative maintenance
- New building technologies
- Energy plant configuration
- Other???



Questions?

health