Supported by

CARBON TRUST

Making business sense of climate change

Food and Drink Federation

IOR Founded 1899

CSDF

BRITISH BEER & PUB ASSOCIATION

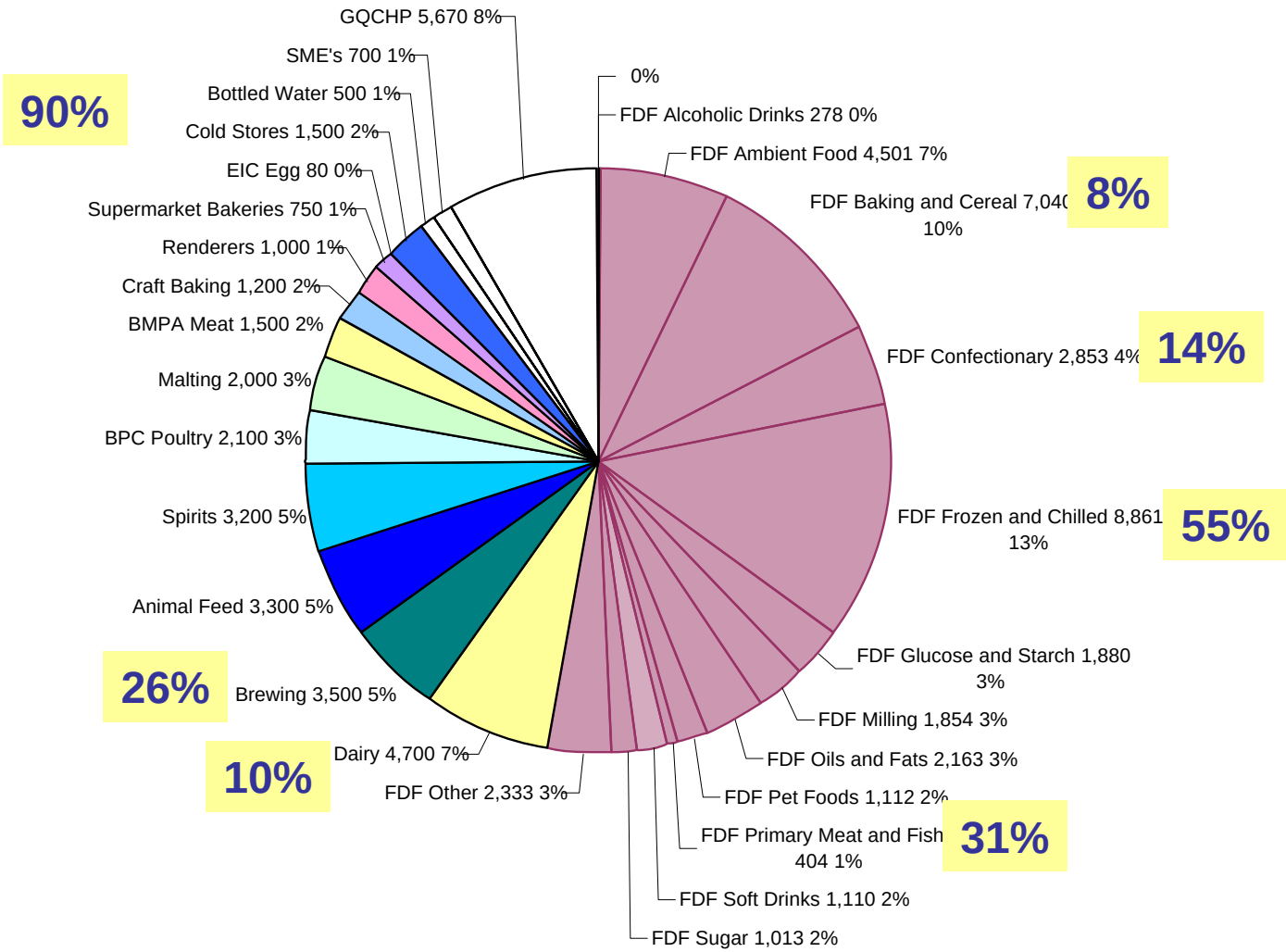
Dairy UK

Food and Drink Industry

Refrigeration Energy Efficiency Initiative

Steve Reeson

Food and Drink Federation


GQCHP 5,670 8%
SME's 700 1%
Bottled Water 500 1%
Cold Stores 1,500 2%
EIC Egg 80 0%
Supermarket Bakeries 750 1%
Renderers 1,000 1%
Craft Baking 1,200 2%
BMPA Meat 1,500 2%
Malting 2,000 3%
BPC Poultry 2,100 3%
Spirits 3,200 5%
Animal Feed 3,300 5%
Brewing 3,500 5%
Dairy 4,700 7%
FDF Other 2,333 3%
FDF Sugar 1,013 2%
FDF Soft Drinks 1,110 2%
FDF Primary Meat and Fish 404 1%
FDF Pet Foods 1,112 2%
FDF Oils and Fats 2,163 3%
FDF Milling 1,854 3%
FDF Glucose and Starch 1,880 3%
FDF Frozen and Chilled 8,861 13%
FDF Confectionary 2,853 4%
FDF Baking and Cereal 7,040 10%
FDF Ambient Food 4,501 7%
FDF Alcoholic Drinks 278 0%
0%
90%
26%
10%
31%
55%
14%
8%

Refrigeration Energy - Drivers

Energy Prices

Legislation
R22
F Gas

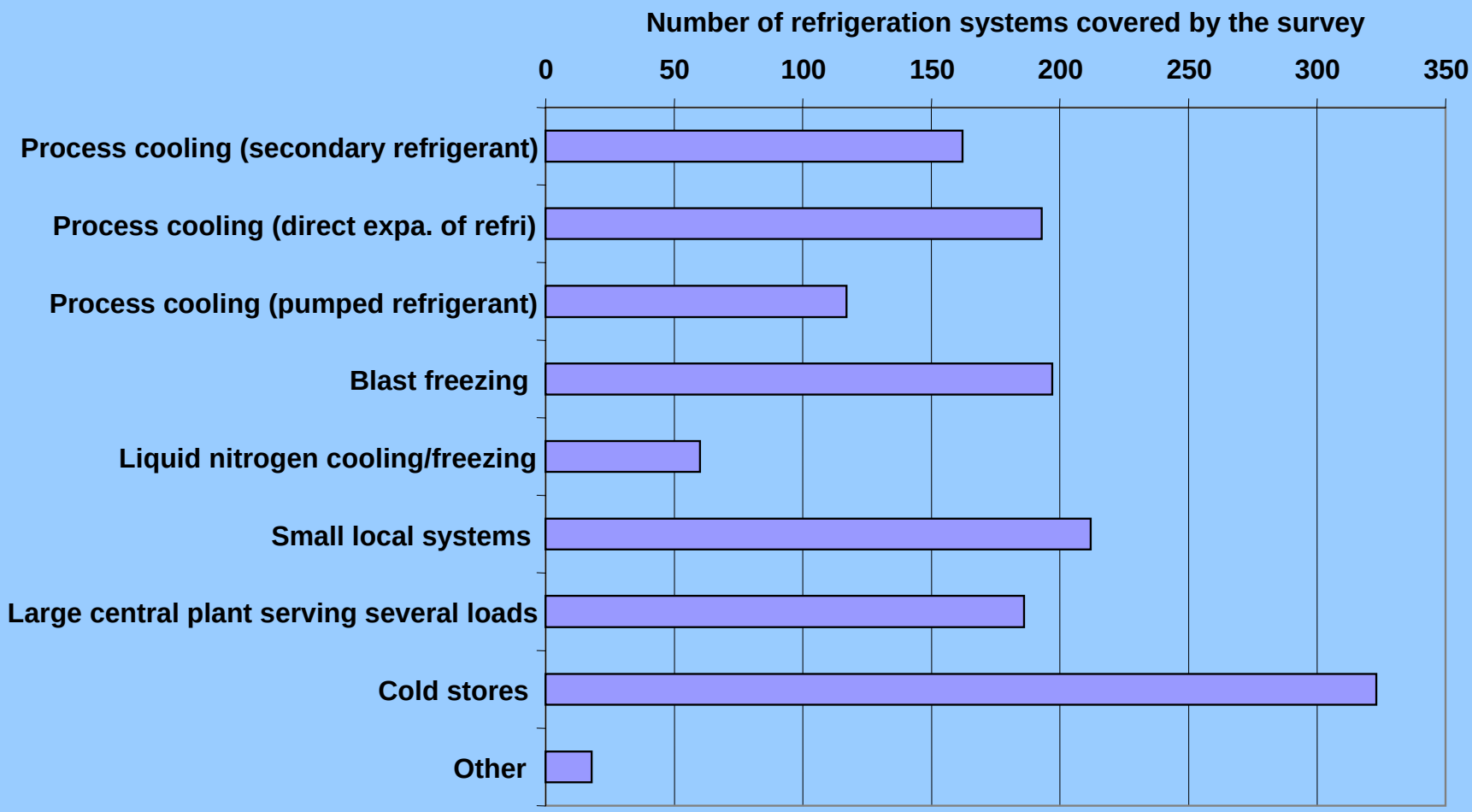
Quality
Safety

Innovation

Consumers

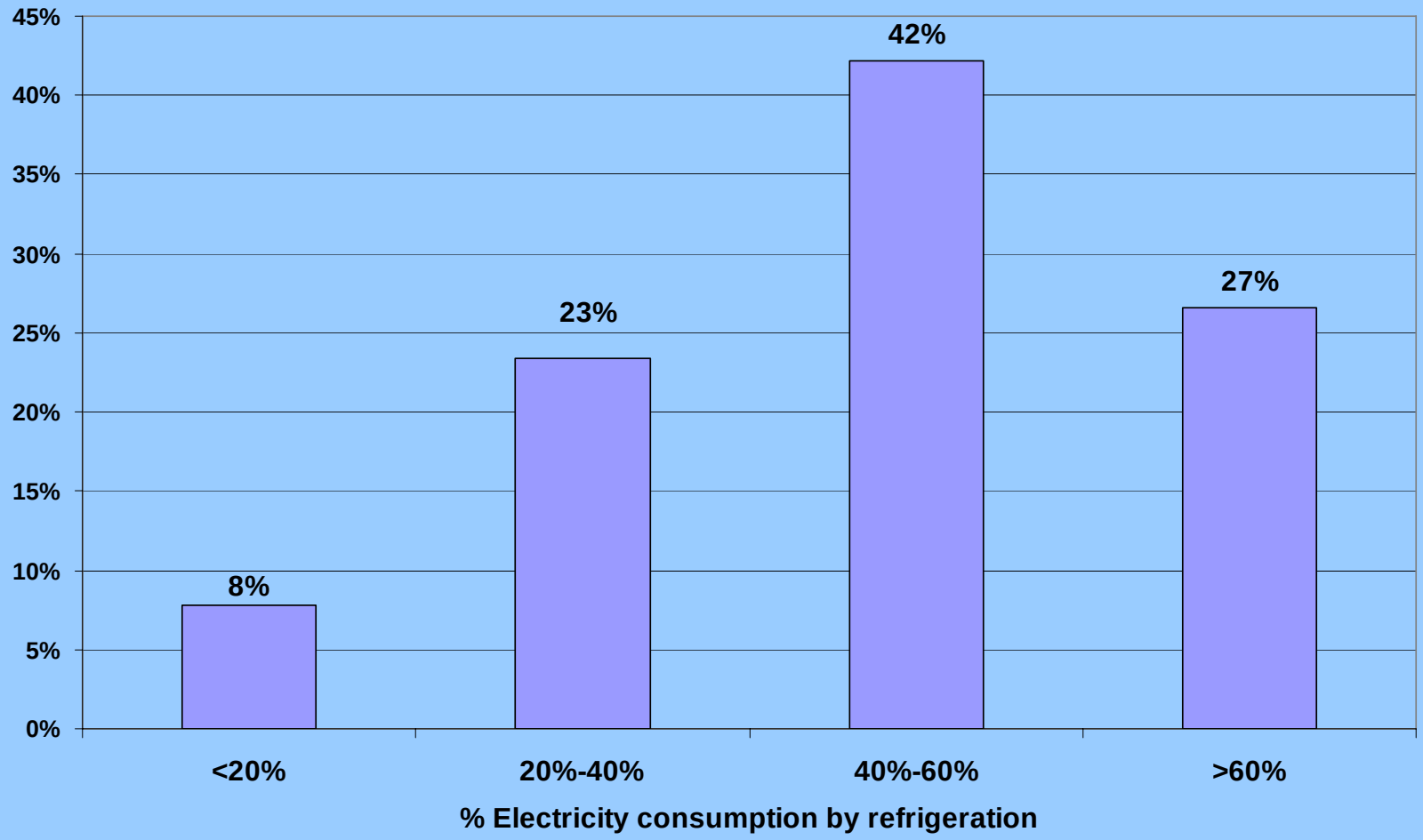
CCA Targets

Sector Survey 2005



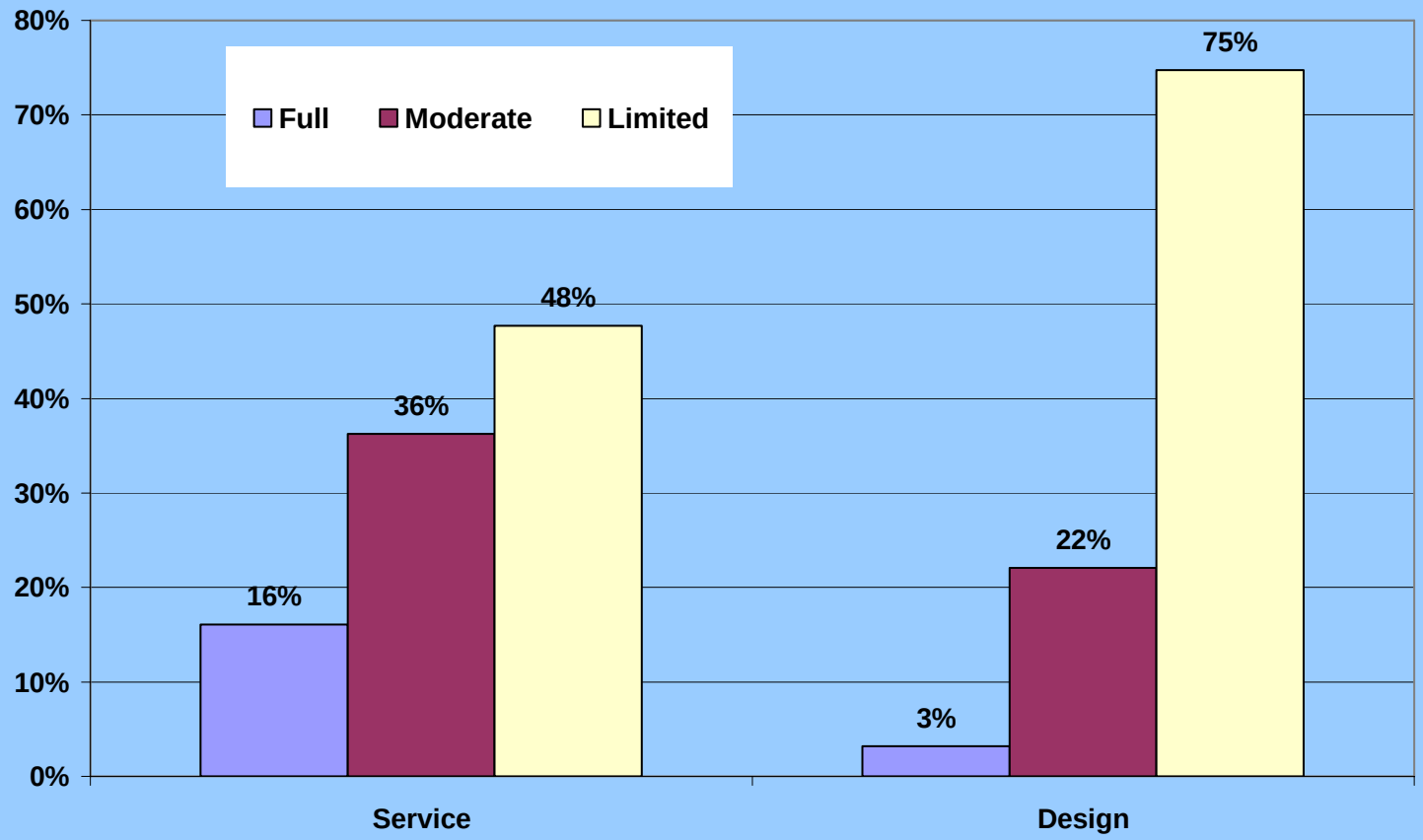
Sector Survey 2005

Importance of Refrigeration



Sector Survey 2005

Knowledge of the technology among site operators with respect to design and servicing



Site Investigation Work

- Reducing heat loads
- Avoiding high head pressure
- Improving part load performance
- Reducing fan and pump power

Reducing heat loads

Cold Store Doors

- automatic closing
- strip curtains
- “inlet tunnels”
- dehumidified outer areas

Avoiding high head pressure

Improving part load performance

Case Study (a) poor part load control of 3 modular water chillers

		Load %	Power kW
Compressor	1	33	90
	2	33	90
	3	33	90
Chilled water pumps	1	100	25
	2	100	25
	3	100	25
Condenser pumps	1	100	20
	2	100	20
	3	100	20
Total Power Absorbed		-	**405**

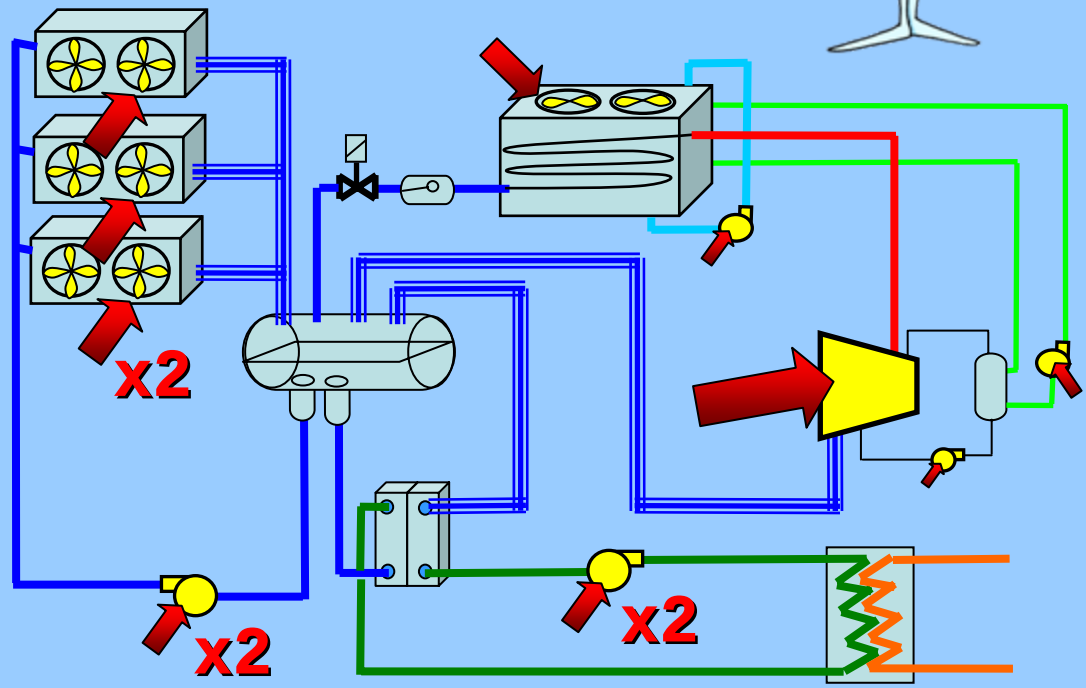
Case Study (b) good control

		Load %	Power kW
Compressor	1	100	150
	2	0	0
	3	0	0
Chilled water pumps	1	100	25
	2	0	0
	3	0	0
Condenser pumps	1	100	20
	2	0	0
	3	0	0
Total Power Absorbed		-	**195**

Saving 52%, 210 kW

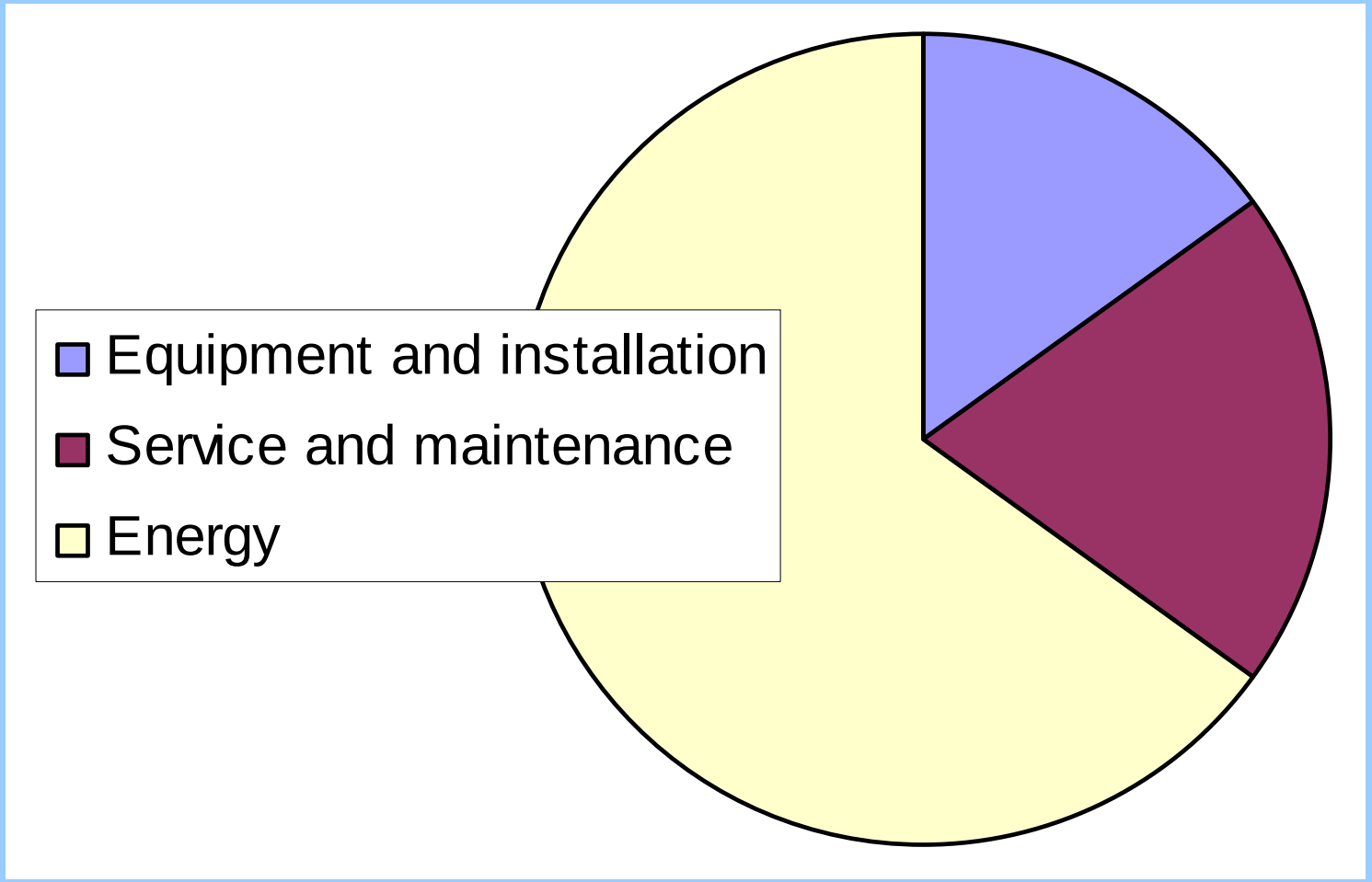
Reducing fan and pump power

Fans & pumps in cooling streams paid for twice



1. Direct electricity to run them
2. Indirect electricity to run compressor to extract heat they have put into cooling stream

The Truth about Refrigeration Plant



Four generic guides

- Procurement of new plant
- Appointing and managing refrigeration contractors
- Checklist of operational improvements
- R22 Phase out and F-Gas Regulations

Dissemination programme

- Site specific reports
- Guides at www.cclevy.com
- 5 regional seminars
- CCA database mail-out
- Trade press

Carbon delivery:

Project plan	**16,253 $TeCO_2e$**
Site work	5,483
Workshops	6,450
Technical and Generic Guides	4,320
Identified during project	**25,5000 $TeCO_2e$**

Sites 21.4 million kWh
Average saving 14%
7 over 25%
Highest 33%

Next Steps:

- Dissemination of results
- Data reporting 29 sites, CCA data collection
- Further technical work at more sites
- SME guidance
- Defra Refrigeration Project
- Carbon Vision