



Mid-trial report on fluorescent globe recycling in the Eastern Metropolitan Region

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Contents

Contents	2
Introduction.....	4
Method.....	4
Pre-trial results.....	5
Recommendations of desktop study of collection models.....	5
Results of pre-trial survey (13 February 2010).....	7
8 week surveys.....	8
Results of 8 week survey June 2010.....	8
Discussion.....	12
Design and aesthetics.....	12
Pre-trial survey.....	13
8 week survey.....	13
Limitations.....	14
Key learnings to date.....	15
Recommendations.....	15
Future direction.....	15
Appendix I.....	16

List of tables

Table 1	Do you know if you can recycle fluorescent globes?	7
Table 2	Would you drop fluorescent globes off for recycling at shopping centre?	7
Table 3	Reasons for answering “No” to dropping CFLs off for recycling at shopping centre. 7	
Table 4	Belmont survey numbers	8
Table 5	Midland survey numbers	8
Table 6	Ellenbrook survey numbers	9
Table 7	Q1. What do you think this (receptacle) is for?	9
Table 8	Q2. Do you know if you can currently recycle CFLs (new type of light globes)?	9
Table 9	Q2b. How did you find out about recycling CFLs?	9
Table 10	Q3. Have you recycled any CFLs?.....	9
Table 11	Q3a. What have you done with CFLS previously?	9
Table 12	Q4. What do you think about the new CFLs?	10
Table 13	Q5. Would you bring your CFLs to this shopping centre to recycle them?	10
Table 14	Q5b. Why /why not? (Would you bring your CFLs to this shopping centre to recycle them?)	10
Table 15	Q5b. Qualitative responses.....	10
Table 16	Suggested places for recycling stations (detailed).....	11
Table 17	Suggested places for recycling stations (general).....	11
Table 18	Q7. How do you think the local council should advertise this?	11

Introduction

The Eastern Metropolitan Regional Council (EMRC) is a progressive and innovative regional local government working on behalf of six member councils located in Perth's eastern suburbs: Town of Bassendean, City of Bayswater, City of Belmont, Shire of Kalamunda, Shire of Mundaring and the City of Swan. The EMRC received funding for a desktop study and trial of public place compact fluorescent light (CFL) recycling in order to trial various collection methods, public locations and communication techniques. The project funding was made available through the Strategic Waste Initiative Scheme, Waste Management Authority of WA, Office of Energy and in-kind contributions by EMRC, its member councils and participating shopping centres, council offices and libraries.

Encycle and Eco Change Consulting were contracted to undertake the project in partnership with the EMRC. Encycle was responsible for completing the desktop study (method outlined below) which provided guidance for multiple factors for consideration including receptacle design, location, and collection methods.

A prototype was designed based on the considerations of the desktop study and pre-trial surveys were conducted to determine levels of public awareness regarding CFL recycling, willingness to bring globes to the shopping centre for recycling and current practices for disposing of CFL globes.

Various shopping centres across the region were invited to take part in the trial. The centre sizes and the positions of recycling receptacles differed across the region. Globes were collected monthly and volumes collected were recorded. Approximately 8 weeks into the trial surveys were conducted at three locations (high, medium and low collection rate locations). These surveys examined the levels of public awareness and attitudes towards CFLs and recycling them. Staff at the three centres were surveyed at the same time. Marketing managers from two centres and the EMRC contractor collecting the globes were interviewed. A detailed description of the methodology and results are provided below.

Method

This project was separated into two parts – a desktop study and practical trial collection. The methodology used is outlined below.

Part 1: Desktop Study of fluorescent light collection models and quantities of items

The study (undertaken by Encycle Consulting) used existing information such as national and state reports that assess the quantity and types of waste fluorescent lights generated in the EMRC region and across Perth. The research included assessment of surveys undertaken by other consultants on behalf of other government bodies and data from Australian Bureau of Statistics and other light collection systems (where available).

The desktop study was separated into two distinct tasks.

Task 1: to identify and assess collection models for fluorescent lights and other similar materials in Australia and overseas

Task 2: to identify recycling options available for Perth based collection systems and to evaluate their effectiveness, impacts, risks and implications to develop a collection system for EMRC that is safe, has minimal environmental and social impact, cost effective, credible and will result in a reliable, positive outcome.

Part 2: Practical trial of collection options

Part 2 of this project was separated into 4 distinct tasks.

Task 1: Liaison with relevant stakeholders and set up trial receptacles

Task 2: Qualitative research to determine community acceptance, effective communication methods and messages, public safety and risk, ease of use, ease of servicing and staff requirements of the receptacles and locations.

Task 3: Quantitative research to determine volumes collected in different locations and in different receptacles, types of lights collected, financial costs in servicing and collecting the lights and contamination levels and types in different locations and for different receptacles.

Task 4: Data analysis and report preparation

Pre-trial results

Recommendations of desktop study of collection models¹

The desktop study found the following in regard to considerations when designing the bins and identifying suitable location and logistics options include:

Bin design:

- A stable design, or even secured to the ground/wall, in a location that is not at high risk from accidental knocks
- Have small opening designs such as ‘rosettes’ or bristles that prevent removal of lamps once deposited and are located high enough to be out of reach of small children
- Bins should be brightly coloured and well signed so that they do not appear to be general waste bins and are easily noticed by users. If ‘wheelie’ bins are used, then bin bodies which are black, brown, green, pale blue and yellow should be avoided as these are already used for common waste or recycling streams in WA
- Signage should be clear about what is accepted and information about recycling should be included

Location:

- Retailers that sell lighting appear to be the most successful location for recycling collection bins
- Placing bins in areas that are well-ventilated would be prudent and responsible
- If placing bins at a retail location, they should be given a specific site and remain there throughout the trial. Moving bins is likely to cause confusion amongst users and reduce effectiveness

Staff:

- To minimise breakage risk, there should be staff in the vicinity of a bin with a specific responsibility for the correct use of the bin. Bins should not be left in public areas with free access (e.g. in a shopping precinct or car park area)

Logistics:

- Lamps should be transported in solid containers (such as recyclable cardboard box or re-usable plastic container) lined with a plastic bag to contain any breakage
- Minimisation of breakage during transport and also reduced manual handling risks could be achieved by transporting lamps in quantities of about 100 units per box – transport economies would be achieved by using stackable boxes on pallets

Communication:

- Some literature will need to be available (either at the bin location or on the EMRC website/standard literature) to address public health risk concerns and to demonstrate that EMRC is adopting a responsible approach to collection and recycling.
- Literature will need to consider the material on the environmental impact of CFLs compared with incandescent lamps.
- The signage and communication approach and project design (e.g. bin location) should consider the barriers

¹ *Fluorescent lights: collection models and recycling: A desktop study.* 2010. Prepared for Eastern Metropolitan Regional Council by Encycle Consulting.

Tube Terminator

- The Tube Terminator must be operated by a fully trained member of staff, equipped with personal protection equipment (safety face shield and gloves). The unit must be kept in a location where it is not able to be knocked, moved during operation or misused to avoid locking the operating computer
- The unit is probably useful at transfer stations or at household hazardous waste drop off day locations by trained and equipped staff

Design features

A receptacle was designed based on the results of the desktop study and the combined experience of Encycle, Eco Change and EMRC staff.

The main features of the receptacle include:

- design that does not resemble other bins (not a wheelie bin)
- red and yellow in colour (eye catching and different to other recycling bins)
- rosette bristles (to limit contamination, avoid OHS issues with broken globes)
- a false floor (limiting the drop and reducing likelihood of breakage)
- a locked door at front of receptacle (locked for security and front access to limit lifting required)
- four collection points (dividing the globes into four containers to limit the weight being lifted in collection)
- pamphlet holders on the side (to hold information pamphlets, but not crowd the front of the receptacle)
- clear, simple signage.

A photo of the 1st CFL recycling receptacle



Results of pre-trial survey (13 February 2010)

A small intercept survey was conducted at Belmont Shopping Centre prior to the beginning of the trial in order to determine levels of public awareness regarding CFL recycling, willingness to bring globes to the shopping centre to recycle and current practices for disposing of CFL globes. The results of this survey are presented below.

Demographics of respondents

Survey staff approached 60 people and had 55 complete the survey (92%). Of the 55 respondents, 34 were female and 21 were male. There was an even spread of ages surveyed. Responses to the survey questions are presented in tables below.

Table 1 Do you know if you can recycle fluorescent globes?

Answer	Number of responses	%
No	49	89
Yes	6	11
Total	55	100

Of the “yes” responses, two had learnt about CFL recycling through their local paper, one from her workplace and the other two were unsure. One person commented that he didn’t know they could be recycled but knew that had to be disposed of in a special way.

Of the four people (out of 55) who reported recycling their globes, three put them in the recycling bin at home and only one took them to the local transfer station.

Table 2 Would you drop fluorescent globes off for recycling at shopping centre?

Answer	Number of responses	%
Yes	32	58
No	22	40
Unsure	1	2
Total	55	100

Table 3 Reasons for answering “No” to dropping CFLs off for recycling at shopping centre.

"No" reasons	Number of responses	%
Rather use bin at home	9	45
Too much effort/can't be bothered	6	30
Would forget to bring them	2	10
Too far to travel	1	5
Take to transfer station	1	5
Don't use CFLs	1	5
Total	20	100

8 week surveys

Intercept surveys were conducted at three shopping centres in the Eastern Region approximately eight weeks after the recycling receptacles had been put in place. There were recycling receptacles at eight shopping centres/ hardware stores, two libraries and one shire office. Cardboard boxes were also used to collect globes at five shire/ local council offices. A Tube Terminator was placed at a council Operations Centre. The three shopping centres (Belmont, Ellenbrook and Midland) were selected for surveys based on the volumes of globes collected in the first eight weeks (high, medium and low respectively). 72 respondents completed the survey.

The aims of this survey were to assess the public's:

- General awareness of recycling availability
- Attitudes towards CFLs (use, cost, environmental impact, health risks, personal use and disposal)
- Attitudes towards CFL recycling (uptake, future uptake)
- Opinions of where receptacle should be, how it looks, information communication
- How best to communicate in the future
- Best location for receptacles

A limited number of intercept surveys and interviews were also conducted with staff and marketing managers from the shopping centres to assess:

- The amount of time spent on upkeep
- Health and safety concerns (internal and for general public)
- Previously unforeseen difficulties
- Suggestions for improvement in any logistics (in this trial and in future)
- Any public questions or feedback to staff
- Staff feedback to managers
- General observations of public use of receptacle
- Location- observations about difficulties or advantages of current location.
- Suggestions for other (possible more suitable) locations

Results of 8 week survey June 2010

Number of respondents to public survey: 72 Number of respondents to staff survey: 6

Table 4 Belmont survey numbers

Belmont 15/6/2010	Number of responses
Belmont Public	30
Belmont Staff	2
Belmont "No"	14
Total asked	46

Table 5 Midland survey numbers

Midland 17/6/2010	Number of responses
Midland Public	19
Midland Staff	2
Midland "No"	17
Total asked	38

Table 6 Ellenbrook survey numbers

Ellenbrook 18/6/2010	Number of responses
Ellenbrook Public	23
Ellenbrook Staff	2
Ellenbrook "No"	26
Total asked	51

Table 7 Q1. What do you think this (receptacle) is for?

Answer	Number of responses	%
Don't know / no idea	41	57
Recycling globes	25	35
Recycling other (plastic/batteries)	4	6
Recycling - not sure what	2	3
Total	72	100

Table 8 Q2. Do you know if you can currently recycle CFLs (new type of light globes)?

Answer	Number of responses	%
No /Don't know	54	75
Yes*	18	25
Total	72	100

* There was no significant difference in levels of awareness between the three locations.

Table 9 Q2b. How did you find out about recycling CFLs?

Answer	Number of responses	%
Walked past green room	8	11
Shire/local council	1	1
Worked at place that recycled them	1	1
Told by grandchildren	1	1
Total	11	15

Table 10 Q3. Have you recycled any CFLs?

Answer	Number of responses	%
No	63	88
Yes	9	13
Total	72	100

*many respondents noted that they have not needed to dispose of these globes yet.

Table 11 Q3a. What have you done with CFLs previously?

Answer	Number of responses	%
Shopping centre	6	8
Rubbish bin	3	4
Shire office	2	3
Total	11	15

Table 12 Q4. What do you think about the new CFLs?

Themes	Number of responses	% of responses
Good/ok/great	15	19
Dim when turned on/ not as bright	11	14
Don't fit downlights/ fittings	9	11
Don't know/no opinion	6	8
Don't/haven't use them	6	8
No real difference	6	8
Good quality	6	8
Ugly/don't like shape	5	6
Energy efficient	4	5
Expensive	3	4
Don't last as long as promised	2	3
Toxic/ mercury concern	2	3
Last longer	2	3
Don't like them	1	1
Break too easily	1	1
Prefer them	1	1
Total	80	100

Table 13 Q5. Would you bring your CFLs to this shopping centre to recycle them?

Answer	Number of responses	%
No	16	22
Yes	54	75
Total	70	97

Table 14 Q5b. Why /why not? (Would you bring your CFLs to this shopping centre to recycle them?)

"Yes" reasons	Number of responses
Often come here	25
Already use recycling at this shop	5
Total	30

Table 15 Q5b. Qualitative responses

"No" reasons	Number of responses
Don't live near here	2
Travel by bus	1
Want something closer to home	1
Easier to throw it in bin at home	1
Can't be bothered	1
Total	6

Table 16 Suggested places for recycling stations (detailed)

Place	Number of responses	% of responses
Shopping centre (general)	32*	42
Shopping centre entrances	11*	14
Where it is (Ellenbrook)	9*	12
Recycling bin at home	6	8
Recycling room at shopping centre	5*	7
Shopping centre - outside supermarket	5*	7
Don't know	2	3
Petrol stations	2	3
Near other bins (at shopping centre)	1*	1
Libraries	1	1
Bunnings	1	1
Coles	1	1
Total	76	100

*Shopping centres – varying locations

Table 17 Suggested places for recycling stations (general)

Place	Number of responses	% of responses
Shopping centre (all responses)	69	91
Don't know	2	3
Petrol stations	2	3
Libraries	1	1
Bunnings	1	1
Coles	1	1
Total	76	100

Table 18 Q7. How do you think the local council should advertise this?

Response	Number of responses	% of responses
Local paper	26	41
TV	10	16
Fliers	10	16
Notices/signs at shopping centre	6	10
Better signage above receptacle	4	6
Don't know	3	5
Council letter	2	3
Advertise like phone book recycling	1	2
Info desk at shops	1	2
Total	63	100

Shopping centre staff results

Cleaners and security at the three shopping centres were asked about the receptacle and its use. Of the six staff, all of the staff reported knowing that the receptacle was there and knew what it was for. None of them reported having received any information about the project, the receptacle or Occupational Health and Safety (OHS) procedures. The only OHS concern mentioned by two staff was that kids might put other items in there. Four of the six staff interviewed felt that the receptacle should be in a busier area to increase recycling rates and avoid vandalism and contamination.

EMRC contractor results

The contractor responsible for collection of CFLs from all recycling locations across the EMRC was interviewed approximately 10 weeks into the trial. The contractor reported having no OHS concerns as he felt the design of the receptacle and the project had been “well researched and prepared”. The only concern he reported was that fluorescent tubes had been left on top of some receptacles. In order to discourage this, stickers had been placed on top of the receptacle with details of places to recycle tubes (see Appendix I). The only contamination reported was a small number of mobile phones and batteries, suggesting that the receptacle should ideally be placed near recycling stations for these products. The contractor suggested that the receptacles should be at shopping centre entrances for ease of access (for public and collection), high traffic to increase volume collected and reduce likelihood of vandalism. There were no other suggestions as to how the system could be improved. The contractor noted that he had been approached by interested shoppers, keen to know about the receptacle and CFL recycling at the shopping centre.

Marketing Managers results

The marketing managers from Belmont and Midland were interviewed (Ellenbrook manger was on extended leave).

Belmont

The Belmont marketing manager was very positive in her interview about the CFL recycling to date. She reported that Belmont was very pleased to have been offered a part in the trial as it fitted perfectly with the centre’s “green approach” and added to the pre-existing green room (recycling room). It was made clear that Belmont was committed to this project and would be pleased to continue beyond the trial period. Although the marketing manager had initially held some concerns regarding OHS, she felt that the research provided pre-trial, the receptacle design and the use of synthetic grass in the room and reduced the likelihood of any OHS incidents. The marketing manager reported having shoppers come to centre management to thank them for providing this service. The following suggestions were made for increased communication within the centre: posters placed around the centre advertising CFL recycling, announcements made over the centre radio and increased feedback to the centre on volumes of CFLs recycled.

Midland

The Midland marketing manager was also very positive in her interview about the CFL recycling to date. The success of the battery recycling program with the EMRC and the pre-trial planning and communication (meetings, data, reports, second set of keys) were the reasons reported for Midland agreeing to join the CFL trial. There were no OHS concerns noted as it was felt that the pre-trial research and receptacle design had addressed any OHS concerns. The receptacle is positioned in the busiest entry of the shopping centre. It was felt that the position of the receptacle was ideal as it was highly visible, yet was not in the line of traffic and therefore unlikely to be hit by trolleys.

Discussion

Design and aesthetics

From the desktop study (and previous experience) it was evident that the design of the receptacle was going to be one of the most important keys to the success or failure of the trial. There are concerns both within the community and those handling the globes about the health effects of mercury and other substances in the globes. Had OHS issues not been sufficiently researched and accounted for in the design, this trial may have never occurred. The original scope of the trial included the use of Tube Terminators™ to crush globes. The

desktop study revealed that this option was not going to be suitable for use by the public as operators of Tube Terminators™ are required to undertake training and wear some personal protective equipment. The final design of the receptacle included locked doors that opened at the front. This design aspect limited the risk of the public accessing globes in the receptacle (which may be broken) and limited the lifting required to be done by the collector – rather than lifting the globes out of the top of a bin, she/he slides the collection box out of the front.

Great consideration went into the design and aesthetics of the receptacle to ensure where possible, contamination rates would be kept to a minimum in order to support future rollout of CFL recycling, rather than provide barriers to its uptake. Small holes for globes (covered by bristles) were used to limit the size of products placed in the bin. This project did not aim to recycle CFL tubes and it was decided that this design feature would mean that tubes could not be disposed of in this receptacle. Research and experience suggested that had an open top bin been used, tubes and other unwanted waste could have easily been collected. The small holes and bristles were also included to prevent the public from putting their hands in the receptacle and would reduce any mercury or mercury vapour from broken globes escaping.

The receptacle was designed to look different to other “bins” to avoid confusion about the product being collected, especially when the receptacle was placed near other bins and recycling receptacles. The colours used (red and yellow) and limited text in signage was a feature included to limit confusion and contamination. The colours were also considered eye catching to draw attention to the availability of this new recycling service. The receptacle was also designed to look clean, safe and appealing. It is obvious that no-one likes to use dirty looking bins and where possible, this receptacle was designed to appeal rather than repel.

Pre-trial survey

The pre-trial survey was conducted to determine levels of public awareness regarding CFL recycling, willingness to bring globes to the shopping centre to recycle and current practices for disposing of CFL globes. This small survey found that most people (89%) did not know that CFLs could be recycled. Just over half of the respondents (58%) said they would bring globes to the shopping centre to be recycled and 40% said they would not. Their reasons for not wanting to bring the globes back varied, with 40% saying (unprompted) that they would put them in their recycling bin at home. This result was significant as it indicated that there was a misunderstanding in the community that CFLs could be recycled through their home recycling bin. As a result of this pre-trial finding, communications for the project focused on two main points; CFLs cannot be recycled in your home bin, they can be recycled at (name) shopping centre. Had this simple survey not been undertaken, the project communications may not have included this important message. The other reasons cited provided a clearer understanding of what the perceived barriers were to CFL public place recycling. These barriers have been considered in the project communication plan and will be taken into account for future CFL recycling plans.

8 week survey

Surveys were conducted approximately eight weeks after the receptacles had been introduced to the shopping centres.

Awareness

Only 35% of respondents knew what the receptacle was for when asked. 57% did not know and 6% incorrectly reported that it was for recycling other products (batteries and plastic

bags). This finding suggest that the signage at the receptacle is lacking as respondents were asked this question whilst the receptacle was in view.

75% reported not knowing that CFL globes could be recycled. This data suggests that extensive communications need to be undertaken (ideally at a national, state and local level) to raise awareness of the need to dispose of this product in a special way (ie not the home bin or home recycling bin). This data suggests that there is currently a low level of awareness about CFLs and their disposal requirements. Most respondents that were aware of CFL recycling had learnt of it by seeing the receptacle. This suggests that the receptacles should be placed in high traffic areas (and green rooms) with clear signage.

Current behaviour

88% of respondents had not recycled CFLs before. Many of them noted that they were still using incandescent globes, had CFLs but had not needed to dispose of any yet, or did not have CFLs as they had downlights. Respondents at the Ellenbrook Shopping Centre reported higher numbers of downlights and less CFLs. Ellenbrook is a new housing estate in WA's Eastern Region. It is likely that many of the respondents at the Ellenbrook Shopping Centre live in new houses which are more likely to have downlights. CFLs for downlights have recently been introduced to the market in WA, but are unlikely to be used by many of these households.

OHS concerns

When planning this project, it was expected that there would be concern about the health and environmental risks associated with CFLs, mainly due to their mercury content. When asked of their opinion of CFLs, only 2 respondents (3%) mentioned this issue. This is an important finding and may influence future communication efforts that perhaps need not focus on this concern as much as others.

Future use

75% of the respondents suggested that they would bring CFLs to the shopping centre to recycle them. This is higher than the 58% in the pre-trial survey. It is difficult to measure the accuracy of this reporting due to variables such as different sample size, different locations etc. Future surveying (prior to trial completion) will provide stronger data on this point. In the pre-trial survey a significant number of respondents suggested that they would prefer to put the globes in the home bin/recycling bin. Only 1 respondent suggested that in the second survey. This may be due to the variables fore-mentioned or may be attributed to other factors such as successful communications, social norms etc. Future surveys will also address this question.

Location

Most respondents (91%) felt that the best place for CFL recycling receptacles was the shopping centre. In particular they suggested high traffic areas (entrances and near supermarkets) and in recycling rooms.

Communications/advertising

When asked how this recycling service should be advertised, 41% said the local paper. Other common responses included TV, fliers, signs at the shopping centre and better signage above the receptacle.

Limitations

This trial is due to finish in January 2011. As it is incomplete, the initial findings can only be used as guidance and points for consideration. A second, identical survey will be conducted closer to the end of the trial. The results of this survey will provide data for comparison.

The sample size of the surveys was small (72 respondents) meaning that data may reflect trends, but generalisations cannot be made.

Key learnings to date

Aesthetics matter – they are also dictated by OHS and contamination considerations

- Pretty bins are good bins – the more pleasing it looks, the more likely people are to use it.
- The public need to be asked before the trial begins to avoid planning based on assumptions. Such an assumption may be that people know that CFLs must be separated from household waste. These assumptions can lead your communications down the wrong path and negatively affect results.
- Collection points should be in high traffic areas
- Signage needs to be big – what looks big in an office or workshop can easily become lost in a shopping centre
- Not all households have CFLs and many have not yet needed to dispose of them

Recommendations

The data collected to date suggests that the CFL trial is successful in terms of design, location and collection methods. Because the trial is still in its early stages, it is too soon to draw conclusions on the volumes collected and the effectiveness of communication to the public by both the EMRC and the shopping centres. It is recommended however, that communication and publicity around the trial are increased, where possible over the next six months in order to obtain the best possible results for the trial. As suggested in the survey data, this increased communication could include: signage above the receptacle (banners), posters and signage at the shopping centres, announcements over the shopping centre radio, signage at the information desk and on maps/information displays at the shopping centre - all advertising the receptacle and its location. This communication would be in addition to the current communication in the form of: articles and advertisements in local newspapers, advertisement on the EMRC website and advertising with other EMRC promotional materials.

No further recommendations will be made until the completion of the trial.

Future direction

The trial will continue over the next six months, with constant communication and media releases prepared by the EMRC.

The communication techniques utilised in this trial are not one of the main variables being tested. It is important however, that we evaluate the communication techniques used in order to identify:

- whether or not the same techniques were used across different locations (and can therefore be ruled out as variables influencing recycling rates at different locations)
- whether the communication techniques were successful in achieving the aims
- communication techniques to be considered for future trials/projects

Evaluation of these points will be conducted through surveys of the general public and analysis of the survey results. The findings of the evaluation will be included in the final report for the project. Globes will continue to be collected monthly to gauge recycling and contamination rates. The same survey will be repeated six to eight weeks before the end of the trial. The results and recommendations will be presented in a final report to the EMRC, the Waste Authority of WA and other relevant stakeholders and interested parties.

Appendix I

Sticker placed on top of receptacle



NO FLUORESCENT TUBES!



GLOBES ONLY

WHERE TO RECYCLE FLUORESCENT TUBES

Household quantities only

- **Your local council office**
Swan Administration Office
Midland
- **Household Hazardous Waste disposal days**
See your *Waste & Recycling Guide* for dates,
or check www.wastenet.net.au

Commercial quantities of tubes

- **Contact a local light recycler**

For information visit www.rgang.org.au