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Waste Management and Energy Recovery: a Significant Business Issue

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Food & Bev LIVE 2014

Waste Management & Energy Recovery

**A significant business
issue**

James Murphy, Lecturer & Author – Dublin Institute of Technology (DIT)

Presentation Overview

- **Introduction and Rationale**
- **Waste management & energy recovery**
- **Performing a waste audit**
- **Reduce and reuse – techniques for bars and restaurants**
- **Waste management programs (WMP) and energy saving innovations**
- **Conclusion**
- **References**

Introduction and Rationale

Introduction and Rationale for Waste and Energy Management Adoption

- Waste Management and energy recovery has become a **significant business issue** for hospitality establishments in recent years. Hospitality establishments have to be **more concerned** about waste in their businesses and be able to **adopt systems to reduce, reuse and recover waste**.
- This challenge is the result of a variety of factors, most notably **the charges** involved in waste removal **and cost** of every businesses energy needs.
- **Costs** have grown dramatically, landfill capacity has become increasingly scarce and expensive. Rising Energy and Waste Costs for Businesses: The period 2002-2009 costs rose: Electricity 65%, Gas 120%, Water 120%, Waste Charges 158%) Petrol 48%, Diesel 57% **Source: Mark Fielding (Chief Executive Officer- ISME)**
- Stringent **legislation** has been introduced around the world to ensure optimum waste management and energy recovery practices in hospitality businesses. **Opportunities** have to be found to reduce, reuse and recycle waste streams, while ensuring residual waste is managed in a **responsible and efficient manner** in compliance with the relevant legislation.
- Businesses must be able to **identify energy saving innovations** for their establishments, they must also be able to **carry out a waste audit** for identifying waste and managing waste streams
- At a minimum, bar owners should have a **practical understanding** of the local and national legislation in this area.
- Owners must also ensure, if necessary by enforcement that their **staff members follow proper waste and energy saving policies**.

Waste Management

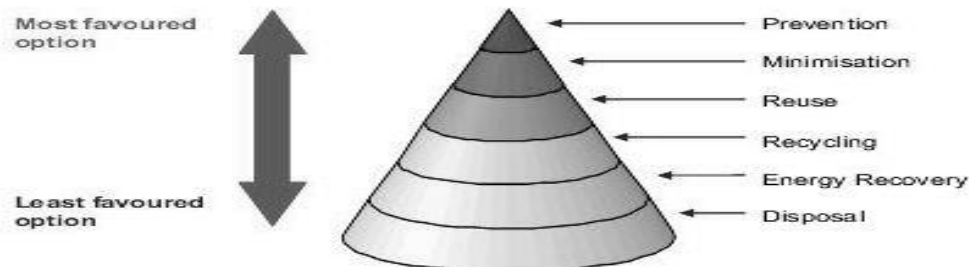
Hospitality owners and management teams might question the merits of spending your precious time considering waste and trying to find methods and techniques to reduce or recycle it.

Why should hospitality establishments recycle or reduce waste?:

- recycling can reduce the bars **operating costs** by diverting materials from disposal,
- waste reduction techniques can **reduce purchasing costs** in addition to **disposal costs**,
- recycling demonstrates a businesses commitment to **environmental protection** to customers, local businesses and it's employees. Most hospitality establishments and pub groups have a **corporate mission statement which includes environmental protection.**
- **Recycling saves** raw materials, energy and reduces environmental pollution.

Some additional considerations:

- Recycling glass saves **25-32%** of the energy used to make **virgin glass**.
- Recycling paper uses **60%** less energy than manufacturing **paper from virgin timber** and **reduces pollutants by 50%.**
- Recycling **steel** and tin cans **saves 74%** of the energy used to produce them from raw materials.
- Recycling **aluminium** uses **95% less energy** than producing aluminium products from raw materials



Waste Management

To assure that your plan will be successful, develop an environmental statement which incorporates your waste management plan into your bars or company policies (staff members handbooks etc).

Developing and implementing a waste management program for your business involves the following

- **writing a waste management policy statement** that reflects the commitment of the bar owner or top management
- **appointing** either (a) an individual (recycling co-ordinator) for smaller locations, the person selected should be genuinely interested in recycling and able to interface with personnel in the hotel, restaurant, bar or (b) a team, green team for larger hotels or pubs groups to champion waste management on-site. Choose representatives from the departments of your establishment that will be most affected by your waste management program. It is also a good idea to have a spokesperson for the employees. The team should have frequent meetings to discuss how their department is doing and ways of improving the program.
- **conducting a review** to establish the current source, nature, quantity, ultimate destination and cost of the waste generated on-site and using this information to identify opportunities.
- **exploring waste prevention and minimisation** opportunities such as: reusable, returnable or recyclable alternatives; substitution; reducing waste generated; talking to your suppliers about reducing/reusing packaging
- **developing a plan which selects projects, sets waste management targets** and responsibilities and implements them, these targets should include reduction goals that are specific and measureable, such as a 25% reduction in food waste hauled away within the next 6 months.
- **communicating the plan** to all staff members and throughout your establishment.
- **training staff** in waste reduction and handling techniques on-site, e.g. through correct segregation etc.
- **working closely with your waste contractor** to maximise the use of your waste management infrastructure, e.g. balers/bins etc.
- **using reputable waste contractors** only and retaining records of all waste transfers.
- **reviewing the waste management plan** and acknowledging staff achievements.
- **adjusting the plan** as new waste challenges arise.

Adopting these practices will lead to process efficiency, innovation and a competitive advantage for you.

Performing a Waste Audit

- **What is a Waste Audit?**, an audit is a simple assessment of the type and quantities of waste that the business generates. It can help you decide which materials can be recycled and how many collection containers will be necessary.
- **Why Do a Waste Audit?**, not all bars or restaurants are the same. The amount of waste and recyclables produced is affected by variables that differ from one business to the next. You need to examine your own waste stream before adopting new programs to assure a good fit with your business.

Performing a Waste Audit

Conducting a Waste Audit:

one approach is to **sort and weigh several samples** of your trash over time. This effort will provide a good accounting of your waste stream composition, another method involves a **review of purchasing and waste removal records**. These records can help you to develop a decent estimate of your waste materials. Look for high-volume materials such as corrugated cardboard, and for high-value materials such as toner cartridges and aluminium cans. These types of materials make good candidates for waste reduction and recycling.

walk through the premises noting what type of waste is discarded in each area. A walk-through will help you determine the size and placement of collection bins.

What you will find:

- The level and type of waste generated by your business will reflect the nature and size of your operation.
- To manage your waste you must understand the quantity and type of waste that occurs on site, reasons why it is generated and opportunities to prevent or minimise this waste.

Generally, waste from business arises under one or more of the following categories:

- **office area:** office paper, corrugated paper or cardboard, other paper, beverage cans and bottles
- **bar and dining area:** beverage cans and bottles, newspaper, uneaten food
- **retail:** packaging waste from the off-license area of your bar
- **kitchen:** food waste, grease/oil, packaging waste like corrugated cardboard, pallets, steel cans, aluminium cans, glass and plastic bottles
- **guest rooms:** newspaper, magazines, bottles, cans.

Types of Waste: the amount and nature of waste **varies from site to site**. You need a **suite of measures** depending on the waste stream involved and whether the waste is being managed on-site or off-site. Ultimate responsibility for all stages of waste management **rests with the producer**. Use a chart like the following on **Chapter 7 Figure 7.21 – p. 139 to keep track of your waste audit**.

Licences required to manage waste on-site: generally, **only waste facilities require a waste licence**. However, if you are not regulated by The Environmental Protection Agency (EPA) and you store hazardous waste on-site in quantities that exceed 25,000 litres (liquid) or 40m³ (solid) at any one time, you must register with your local authority.

Tip: (managing waste on site) different businesses produce different types of waste and it is important to **know what type and volume of Waste your business generates** if you are to manage it effectively. **Make yourself aware of your obligations** with regard to waste management on-site. **Look at your existing work processes** and identify opportunities for waste reduction. **Segregate non-hazardous waste** from hazardous waste. Label and store your waste streams appropriately.

Reduce and Reuse: techniques for hospitality establishments

Identify any waste stream that can be reused, recycled and recovered in your business,

Purchasing

- Supplier involvement, purchasing guidelines, dispensing systems

Donation

- to local shelters, cardboard and plastic cartons offered to local schools or day care centres, flowers send them to a local hospice or community centre
- send un-served food to local food banks, scraps can be composted on site or donated to local farmers for composting.

Waste minimization

- health department approved dispensers for straws, pourers for sugar etc, re-useable cloth towels, buy beverages in concentrate or bulk form, minimal packaging, buy shelf-stable food supplies in bulk, offer customers a discount if they bring their own mugs, containers, or bags, print daily specials on a chalkboard

Reuse

- store food in reusable containers, turn stained tablecloths into napkins and chef's aprons, use cloth linens and old linens for rags, collect and resell used cooking fat (oils) back to a manufacturer, .

Food Preparation and Storage:

- adjust stock levels on perishables to reduce waste, use daily production charts to minimize over prepping, prepare foods to order, adjust the size of meal portions, wrap freezer products tightly, label, and date them, check your produce deliveries carefully for rotten or damaged product, and return any substandard product, rotate perishable stock at every delivery to minimize waste due to spoilage, clean coolers and freezers regularly to ensure that food has not fallen behind the shelving and spoiled, arrange your refrigerated and dry storage areas to facilitate easy product access and rotation.

Reduce and Reuse: techniques for Hospitality Establishments

Waste Management Equipment

The correct waste equipment can help to ensure waste is properly managed. Waste volumes can be reduced by using compactors, balers, shredders, etc. Colour coded waste bins should be used to assist in segregation. Do not put liquid or wet wastes into compactors.

- **Burning waste:** It is illegal to burn waste.
- **Awareness:** Identifying waste management opportunities and introducing good practice are the first steps. To be truly effective, however, staff must be appropriately trained and protective clothing and equipment must be provided where necessary. Staff should be regularly updated as to the success of the initiative.
- **Emergencies:** Develop and implement emergency plans and response procedures if handling or storing any waste on-site.
- **Environmental protection agency (EPA) regulated sites:** Business activities regulated by the EPA must comply with all the on-site and off-site waste management conditions set down in the EPA's licences. All other companies must comply with waste legislation and implement best practice as outlined in this guide. It is your responsibility to ensure that your waste is properly managed on your site.

Waste Management Programs and Energy Saving Innovations

WMP - Case studies (chapter 7 – pp. 142-144 'Starbucks' and 'Marriott International Conference Centre' for discussion)

Energy Saving - industry examples and recent innovations in the bar area (chapter 7 – p. 143-144)

- **Light fittings:** energy saving bulbs use 80% less electricity than a traditional bulb.
- **Fridges:** 60% less energy is used by the new models. Small fridges stocked regularly.
- **Ice Machines:** fitted with a new patented system of heat recovery which saves 20% on energy costs.
- **Hand dryers:** Dyson Airblade uses 80% less energy than normal hand dryers. HEPA filter removes 99.9% of bacteria.
- **Hand soap:** soap cartridges 3,000 doses instead of the regular 2-3 squeezes of the soap dispenser – saves up to 50% on liquid soap
- **Kitchen:** different chefs operating the same kitchen with the identical menus can use up to 50% more energy, why? (turning on ovens too early, leaving cookers on at cooking temperature).
- **Food waste:** the Electrolux waste management system which can reduce the volume of food waste in a pub or restaurant for up to 80%, it removes excess water from the waste,
- **Dishwashers:**– run them only when full, use a water softer to prevent scale formation and minimise energy use, consider use of low temperature sanitising liquids.
- **Extraction:** only used when needed, use of variable speeds, heat recovery from exhaust.
- **Car park area:** installing low energy lamps, motion detection, day light sensors, and power correction techniques savings of up to 40%
- **Water:** turn on taps changed to push buttons or sensor. Waterless urinals are used now by large pubs companies land food companies like McDonalds this approach can save up to 100,000 litres of water annually in their restaurants.

Waste and Energy Saving Examples

1. Light: CFL (compact fluorescent) comparisons.
2. Water: waterless urinals.
3. Food Waste: Recovery / kitchen equipment & systems.

How they stack up

A compact fluorescent bulb activates phosphor to produce light. A phosphor coating inside the lamp gives off light when it is exposed to ultraviolet radiation. The bulb doesn't use heat to create light, which makes it more energy efficient.

Regular (incandescent) bulbs produce light by heating a filament inside the bulb. Electric current passes through the filament, heating it to the point that it becomes white-hot and emits light. Most of the electric energy incandescent bulbs use is converted into heat.



COMPACT FLUORESCENT
(23 watt)
Average life:
10,000 hours

Cost:
\$11
Comparable lighting:
1,500 lumens

THREE-YEAR COST COMPARISON

Electricity cost: \$8.06

Bulb cost: \$11
(1 bulb for 3 years)

Total cost: \$19.06

INCANDESCENT
(100 watt)

Average life:
750 hours

Cost:
75 cents

Comparable lighting:
1,690 lumens

Electricity cost: \$35.04

Bulb cost: \$4.50
(16 bulbs for three years)

Total cost: \$39.54



*At 8 cents/kilowatt-hour, four hours burned per day



Food Recovery Hierarchy



Waste Management & Energy Recovery – James Murphy Lecturer & Author (DIT).

Conclusion / Further Reading & Resources

Conclusion

Waste Management and Energy recovery

- The problem and challenge of waste management and reducing energy costs has become a significant cause of concern for bars.
- Through the adoption of more sustainable activities such as energy reduction, waste minimisation, prevention and recycling, bars have demonstrated that through simple waste management measures, cost of waste disposal can be reduced significantly.
- The case for waste minimisation (wm) is well proven both in financial and environmental terms.
- The introduction of waste management and energy recovery programmes is not limited by the availability of technology, as most measures are simple and local governments will provide help and assistance to those interested in implementing (wm) strategies for their bar.

Further Reading & Resources

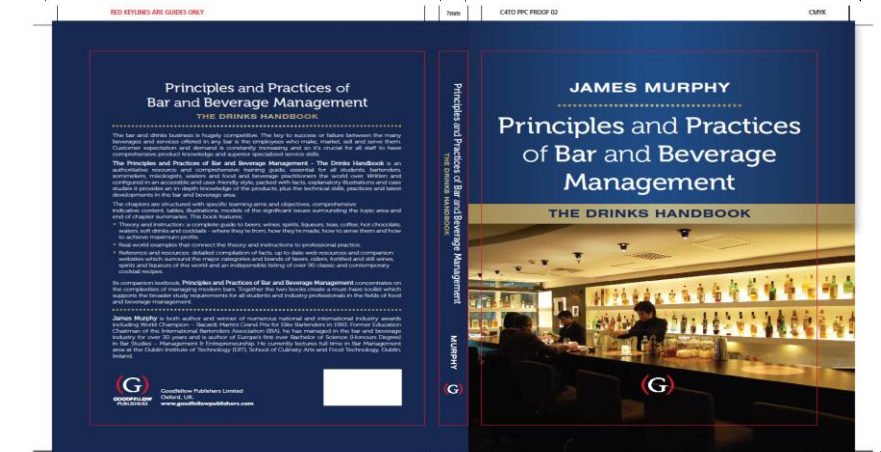
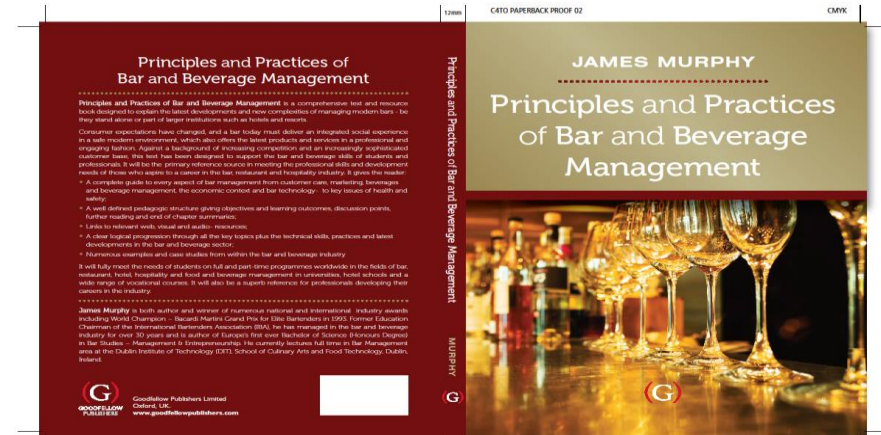
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<http://www.goodfellowpublishers.com/academic-publishing.php?promoCode=&partnerID=&content=story&storyID=316&fixedmetadataID=211> P.P.B.B.M – D.H Book

Training & Skills Development

The Dublin Institute of Technology, School of Culinary Arts & Food Technology, Cathal Brugha Street, Dublin 1. (Full / Part-time courses)



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- Waste Reduction in Hotels and Motels and Food Service Waste Reduction, available; <http://www.ciwmb.ca.gov/mrt/wpw/wpiz/fshotelz.html> [accessed 10/5/10]

Web resources

- Focal Water Free Technologies, Waterless Company.
- www.sustainablehotel.co.uk/Improve_waste.html Sustainable hotel.
- www.ibec.ie/IBEC/IBEC.nsf/Search?OpenForm&Query=waste%20management Waste management resources.
- www.epa.ie/techinfo Environmental protection: tools and information.
- <http://0-wmr.sagepub.com.ditlib.dit.ie/> Sage academic journal: 'waste management and research'.
- <http://www.liv.ac.uk/sustainability/Waste%20Management/main%20page.htm> University of Liverpool Waste Management.
- <http://www.jarshire.co.uk/> Waste Management equipment.