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Adopting sustainability in equipment planning



I. F. H. E.

Ray Bielby MIHEA, RN, MHSM, business development manager and medical equipment planner/clinical consultant, Schiavello Hospital Solutions, examines how medical equipment planning can encompass sustainability goals.

The concept of sustainable development and management is not new to healthcare, but restraints on budgets, the lack of champions, poorly developed green strategies, and the unavailability of appropriate materials, generally mean that sustainable hospitals or healthcare environments have struggled to become a reality.

Yet, sustainable development, with its underlying definition of using resources more efficiently and reducing the everyday environmental impacts, is now catching up with healthcare facility building and planning.

However, what about medical equipment? Despite the fact that it uses a considerable percentage of the funds required to complete a healthcare project, it has been all but ignored in the sustainability management process. The question therefore is asked, how can medical equipment planning encompass sustainability goals while balancing the economic, social, environmental and political issues which impact on the process? This paper hopes to answer this question.

Sustainability

As the move towards sustainability management gains momentum, the understanding of the definition of

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Table 1: Principles.

- Dealing transparently and systematically with risk, uncertainty and irreversibility.
- Ensuring appropriate valuation, appreciation and restoration of nature.
- Integration of environmental, social, human and economical goals in policies and activities.
- Equal opportunity and community participation/sustainable community.
- Conservation of biodiversity and ecological integrity.
- A commitment to best practice.
- No net loss of human capital or natural capital.
- The principles of continuous improvement.
- The need for good governance.

sustainability and sustainability management is important. One of the most cited definitions of sustainability is from the Brundtland Commission.¹

It defined sustainable development as: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

Common principles

Literature outlines common principles under which sustainable development is defined, as well as the processes needed in implementation to ensure that a successful sustainable management project can be achieved. These principles are perhaps best outlined as in Table 1.²

Driving forces

Considerable benefits can be obtained through effective equipment planning and procurement, including:

- Reduced ongoing costs and equipment maintenance due to product efficiencies and increased lifecycles.
- A healthier, more user-friendly work environment.
- Being seen as a responsible, environmentally caring facility.

- Significantly reduced waste disposal and occupational health and safety costs related to equipment.
- Helping to improve the organisation's impact on the overall quality of the environment.

Considerations

Sustainable procurement aims to integrate environmental considerations into all stages of the purchasing process.³

Some of these considerations are:^{3,4}

- The promotion and maintenance of competitive and contestable markets, providing for innovative and competitive solutions while reducing whole life costs.
- Environmentally friendly purchasing.
- Eco-procurement.
- Innovation and opportunities for small and medium enterprise.
- Promotion of the green agenda and green purchasing.
- Development of overseas objectives, including fair trade.
- Promotion of skills and trading.
- Products which are considered to do less harm to the environment and human health when compared with other products.

Remember that, if sustainability practices become essential in equipment management, then the market will search for ways to comply.

This effect can be demonstrated in Figure 1.⁵ This shows how innovation is driven by market needs, and that there is significant evidence that the next waves of innovation will be driven by the need to improve productivity while lightening the impact on the environment.

The sustainable equipment planning and procurement process incorporates this concept and adds to it economic planning. It recognises the need to eliminate waste and the need to review the lifecycles and financial viability of products.² It also is required to look at ways of futureproofing facilities by looking at emerging equipment trends and product lifecycles. Remember, in some cases you are planning for a facility which may not open for many years and be required to function for many years beyond that.

The benefits

If equipment can be planned, sourced and procured using sustainability management processes, it will help provide healthcare facilities with some significant benefits:

- By purchasing user-friendly clinical equipment clinicians spend less time with technology and more time with their patients.
- Reducing waste and waste disposal reduces the occupational health costs to the facility and the community in general.
- Healthcare facilities can promote themselves as a positive, proactive eco-friendly community service.
- By purchasing products which are upgradeable the economic burden in

health is reduced through reduction in replacement costs.

- Equipment which has a reduced requirement for energy and water will help economically while conserving valuable natural resources.

The cost of not purchasing sustainable equipment can mean significant, and in some cases, unidentified costs, being encountered by a healthcare facility downstream. The example shown in Figure 2 demonstrates how buying an item which has a lower purchase cost without determining the ongoing financial and environmental costs can significantly impact on both the financial bottom line and the environment.⁴

What to look for

A policy that encourages development and dispersal of environmentally sound medical equipment planning and procurement can make a significant contribution to sustainable development. However, in all procurement practices there are hidden values in both energy and water conservation, and one should never underestimate the financial savings impact that responsible sustainable management can have on the bottom line.

The following list looks at many of the issues and practices which could be implemented into equipment planning and procurement practices. As a minimum requirement equipment must:

- Be durable. Look for products that are robust in appearance. It is useful to network with other procurement groups to help with this selection process. Clinical research into this area is extremely useful. If it cannot hold up during the rigours of day-to-day clinical use it will spend more time in the repair shop than in the field.

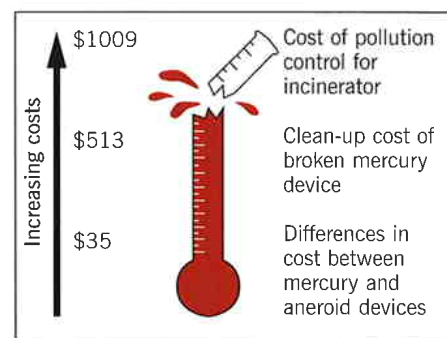


Figure 2⁴: How costs increase further downstream.

- Be user-friendly. The whole world is not full of technocrats, so the products must be simple to use and maintain by those at the "coalface". At a time when there is a declining number of healthcare providers it is all about ensuring that these providers spend less time with the equipment and more time with their patients.
- Meet all relevant occupational health and safety and manufacturing standards. The equipment needs to be certified and compliant with all relevant Australian Standards, addressing issues such as safety, ergonomics, energy and resource efficiencies.
- Not be an end-of-lifecycle product: Ensure that the product being purchased is not being superseded

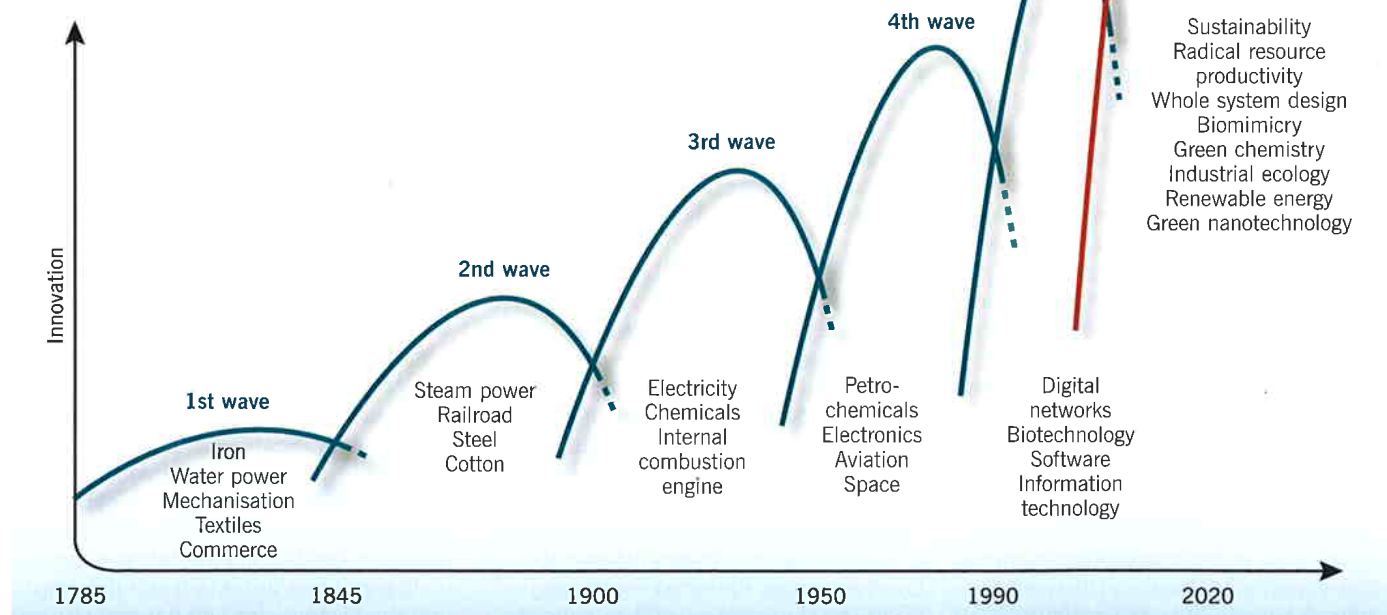


Figure 1⁵: Waves of innovation of the first and the next industrial revolution.

by the manufacturer. This is even more important when the equipment planning and purchasing for a project is occurring years in advance of its completion.

- Be repairable through the life of the product. Ensure that replacement parts are available during the product's anticipated life.
- Preferably be expandable and upgradeable. If products can be upgraded or expanded as the need arises, this will reduce the need to replace them, and helps extend the product's lifecycle. This, in turn, will reduce the impact on environmental resources, training and maintenance schedules.
- Be energy-efficient. With the growing costs associated with energy consumption, hospitals can reduce their operating costs by being mindful of the energy requirements of the equipment. Energy star ratings should accompany any product considered for purchase and should always influence the selection decision.
- Be water-efficient: Water efficiency is a major issue in sustainability, and a reduction in water consumption is both economical and environmentally responsible. There have been several studies undertaken relating to how much a typical healthcare facility would use per day. A 1996 study conducted in Massachusetts, USA found that as much as 336 million litres per year was used by hospitals with a 550-bed capacity.⁶ The breakdown of this water use is also shown in Figure 3. Researching and purchasing equipment which provides a reduction of water consumption is both economical and environmentally responsible.

Facilities studied in the Massachusetts example include hospitals with 138-550 bed capacities, in-patient admissions of 5,100 to 11,600 per year, and annual water use ranging from 15-67.2 million gallons. The seven hospitals studied included: one large Boston, one large long-term care, four small communities, and one regional urban.

- Be recyclable and come with an end-of-life options contract. There are growing legislation trends overseas to have manufacturers take back their medical equipment and computer products at the end of their lifecycles to be recycled.⁷ This process should be considered in future procurement practices in Australia.
- Be able to integrate with clinical systems when appropriate. When purchasing IT equipment, whether it be monitoring or communications systems, it is important to establish its level of integration into the organisation's existing or future planned IT systems.

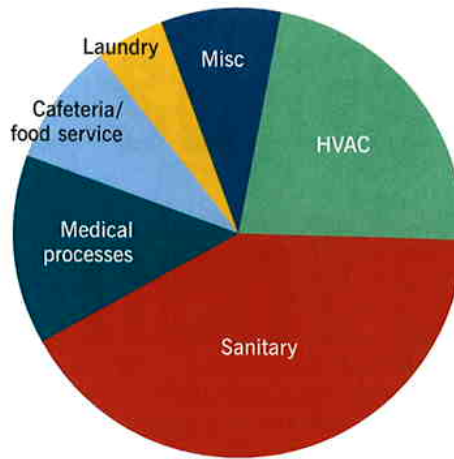


Figure 3²: Average water use by category of facilities studied.⁶

Careful planning will help the facility reduce the risk of expensive upgrades or product replacement in the future.

Specifiers of equipment and services should also develop an audit / tracking process that ensures that the performance of all the products used in the hospital is reviewed. The information obtained in this process will assist future planning and purchasing practices. They should also give preference to manufacturing companies with a high green rating – this will help drive the process of change and help promote sustainable development in medical equipment planning and procurement – and to local and regional manufacturers. Those that meet the above criteria should be sought and engaged whenever possible. This keeps the finances local and provides greater access to maintenance and repair facilities.

A guide to EPP

The Environmentally Preferred Purchasing (EPP) "How To" Guide (Table 2) has been referred to on many occasions in this paper, and would be considered as "required reading" for anyone considering sustainable equipment planning and procurement.⁴ The creator of this chart believes that by understanding and using it, it will foster a culture of acceptance and acknowledgement of the process of environmentally responsible equipment procurement.

Assembling a team

Assembling an organisation's sustainable development, medical equipment planning and procurement team is essential, and engaging a professional equipment planner who has a significant amount of knowledge and experience in this area should always be considered. This helps to promote and educate the environmental concept within the organisation.

There are several things listed in the Environmentally Preferred Purchasing (EPP) literature that a healthcare facility should consider when selecting the

- personnel for this team. These include:
- Representation of relevant personnel from the areas which the products will impact, both clinical and managerial.
 - Representation from the management/administrative group.
 - Representation from occupational health and infection control groups.
 - Representation from personnel who have sound understanding of equipment and planning.
 - People who have an understanding and belief in the value of the process.⁴

The aim of this team should be to challenge current practices and promote sustainable management processes. The team should also use the knowledge gained to help educate senior management and product users of the advantages of being an environmentally responsible healthcare facility.

Procurement resource and support groups

To help understand and implement sustainability management practices into equipment planning and procurement, it is important to be aware of the support groups that are available to assist, both locally and internationally. A list of some of these professional groups has been included in Appendix 1.

Success and planning

The economical and environmental success that has come from healthcare facilities achieving energy and water savings without compromising the quality of the service is growing. This clearly shows that there are effective and economical sustainable products available. Clark Read of the United States Environmental Protection Agency believes strongly that a lot of these success stories are a result of the Energy Star rating system.⁸ This system is widely accepted as a guide to purchasing in Australia, as well as overseas. It is stated that the key benefits to selecting star-rated products are/include:

- These products use 25 to 50% less energy.
- Reduced energy costs without compromising quality or performance.
- Reduced air pollution because fewer fossil fuels are burned.
- Significant return on investment.
- Extended product life and decreased maintenance.⁸

In Australia, important successes in sustainability management of equipment have come in water savings, with the most noted of these being sterilisers. The water consumption of these essential beasts is significant. Retrofitting of these units eliminates water tempering during non-sterilising cycles and this can reduce the amount of water used in a cycle by as

much as 70%. For a hospital such as The Northern Hospital in Victoria, which estimated its water consumption for its Central Sterilisation Services Department (CSSD) sterilisers at 1,357,000 litres per day, this meant a saving of around 947,000 litres a day.⁹ If you take this into context it should be mandatory for all sterilisers purchased and every steriliser used within the health system to be modified to achieve similar water-associated cost savings.

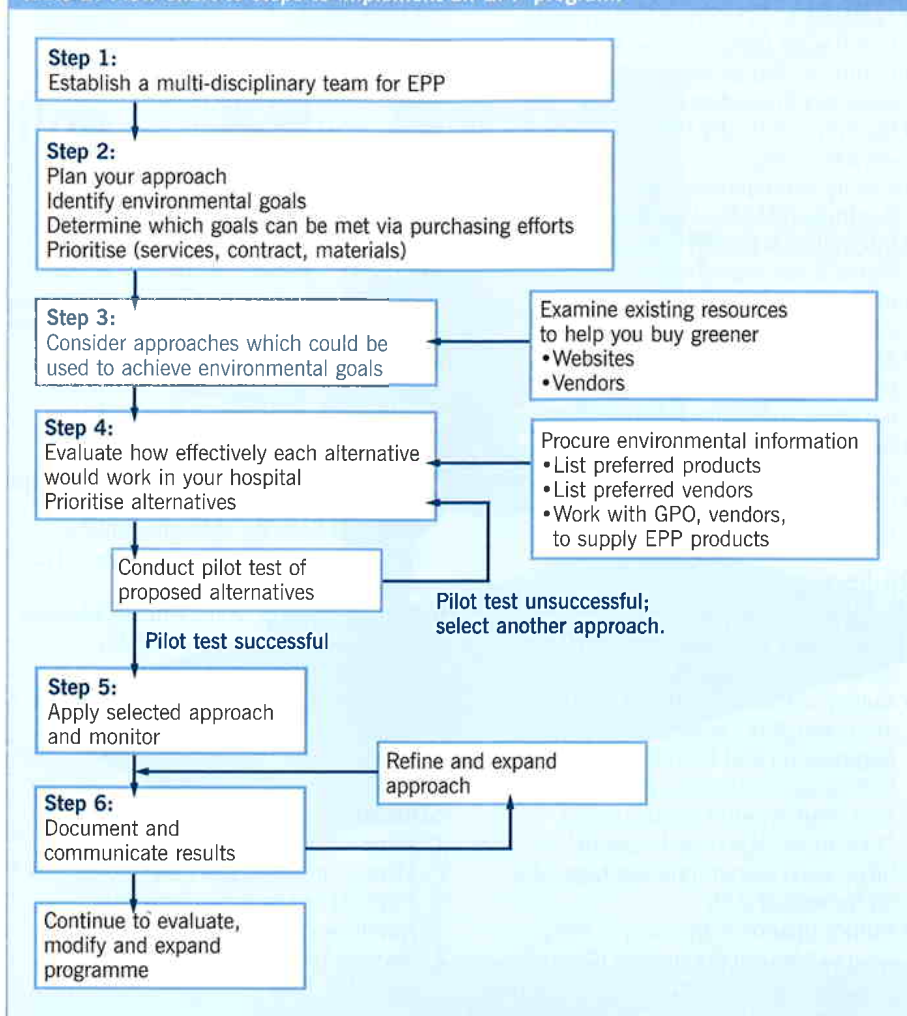
Other areas which have responded to the need to incorporate sustainability into medical equipment planning and procurement by addressing the amount of water and energy required to operate are:

- Heating and cooling systems. Closed loop cooling systems are being recommended as a method of cooling medical equipment such as x-ray machines, CAT scanners, medical pumps and air compressors.⁶ This significantly reduces the amount of water and energy used for this process.
- Sanitary systems. Products such as macerators, which can potentially be used in place of pan flushers, reduce comparative water consumption by as much as 60%, and energy use by as much as 97%, and these are proving to be popular.¹⁰
- Hospital kitchen equipment. The hospital kitchen is an area where energy star ratings can have a significant impact in both energy and water consumption. Energy star-rated cookers, commercial dishwashers and other equipment, such as combination ovens, have been shown to be up to 60% more water-efficient than standard models.⁷ Many of these products now achieve more with less energy, so both significant energy and water savings can be made.
- Laundry. Laundry services have also historically been a high energy usage area. Again, energy-rated equipment should always be selected and, where possible, supplemented with other forms of environmentally friendly technology. One such support technology was installed by Portland District Health in South Western Victoria. This product was classified as an Ozone Laundry Support System and the supplier suggested savings in water consumption of up to 40% over standard practices, reducing both washer cycle times and energy requirements for ironing and drying equipment. Reports indicate savings in both energy and labour requirements.¹¹

The future

A report published by the Australian Sustainable Built Environment Council has suggested that, through energy efficiencies, energy use in buildings such

Table 2: Flow chart to steps to implement an EPP program.⁴



as health facilities can be reduced by as much as 70% by the year 2050.¹²

The future of sustainability management in equipment planning and procurement is exciting. In the United States the Energy Information Administration has stated that:

"Healthcare organisations spend over \$8.3 billion on energy each year to meet patient needs. Every dollar a non-profit healthcare organisation saves on energy is equivalent to generating new revenues of \$20 for hospitals or \$10 for medical offices. Just a 5% reduction in energy costs in for-profit hospitals, medical offices, and nursing homes can boost earnings by a penny per share."⁸

Electronic web-based systems are becoming more intricate and are providing equipment planners with more and more detailed information about both product and supplier. These programs have the potential to identify and acknowledge environmentally sustainable providers. Websites such as Energy Star, <http://www.energystar.gov>, provided by the United States Environmental Protection Agency, offer vast amounts of information and supporting data to assist with planning and selection.

Conclusion

International Council of Local and Environmental Issues (ICLEI) Sustainable Procurement director Christoph Erdmenger, at the launch of a new campaign on sustainable procurement, stated: "More sustainability for the same money – this is the motto which should convince more and more politicians of the concept."¹³

A significant challenge is before us. We need to continue to break traditional models and aged concepts to force procurement facilities to abandon all or some outdated ideas and adopt the sustainability management process. There is a need to constantly remind senior management of the short and long-term economical benefits to users of investing in a sustainable equipment procurement process.

New facility budgets need to incorporate adequate funding to ensure that sustainability procurement can be achieved without the pressure of compromise.

There are many goods and services available to support sustainability. We just need to be allowed to access them, and to have a champion with the capacity to effectively pitch to senior management the financial and moral value of sustainable management in procurement. +

Appendix 1

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- Centre of Health Assessments Australia www.healthfacilityguidelines.com.au
- Electronic Industry Code of Conduct. www.eicc.info/
- Facility Management Association of Australia (FMAA). www.fma.com.au
- International Facility Management Association. www.ifma.org/
- Institute of Hospital Engineering Australia. www.ihea.org.au
- State and federal government environmental relevant websites, e.g. www.sustainability.vic.gov.au
- Sustainable Hospitals Program. www.sustainablehospital.org/
- US Environmental Protection Agency (Energy Star). www.epa.gov/

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Prior to the end of 2006 he had managed an orthopaedic operating theatre complex, as well as recovery, day surgery and CSSD facilities, for 12 years. During this period he was also involved in several hospital redevelopment projects.

His current role is as a business development manager/equipment planner and clinical design consultant for a newly formed company, Schiavello Hospital Solutions.



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