This is a sample document. The full version will be released via GGHH connect (www.gghhconnect.net)

GLOBAL GREEN and HEALTHY HOSPITALS

Water

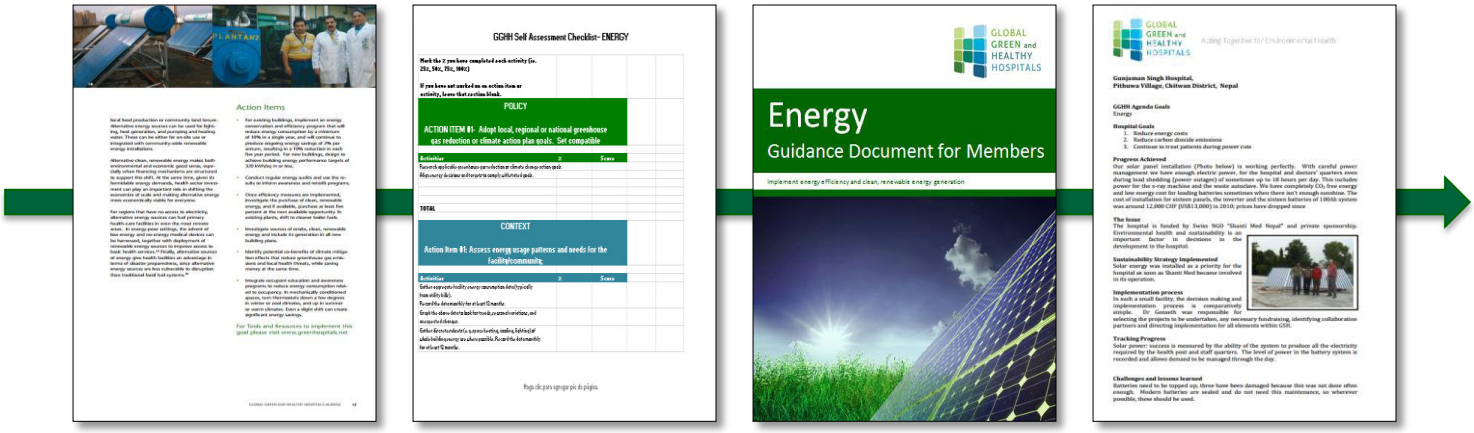
Guidance Document for Members

Reduce hospital water consumption and supply potable water

The GGHH Guidance Document Series

Global Green and Healthy Hospitals is producing a series of Guidance Documents—one for each of the ten GGHH goal areas. These documents are intended to assist GGHH member hospitals and health systems around the world reduce their environmental footprint and promote environmental health.

They are also designed as integral parts in a system that logically progresses from the Action Items in the GGHH Agenda; to Self-Assessment Checklists that members can use as a benchmarking tools; to the Guidance Documents themselves and associated case studies and resources; to a series of measurement tools to help members measure their progress over time.



These documents, which are available to members as an integrated online system via GGHH Connect, are also downloadable in PDF format. They are designed as participatory, living documents. That is to say, GGHH wants membership feedback and suggestions for actions, examples, case studies, links and the like so that these Guidances can evolve based on the real experience and input of our members. We aim to update them regularly.

About this Water Guidance Document

In many parts of the world, access to reliable potable water supply is a major challenge for healthcare facilities and the populations they serve. A key element of population health is access to high quality potable water; communities that lack access present a range of water-borne illnesses that stress healthcare delivery infrastructure. Hence, healthcare organizations can play an important role in demonstrating the responsible conservation and use of water, as well as advocating for reliable potable water access and infrastructure in their communities.

Wastewater discharge from hospitals presents a range of challenges. Where wastewater collection infrastructure is available, municipalities may express concern about medical contaminants ranging from chemicals to pharmaceuticals. At the same time, recent developments in on-site wastewater treatment system technologies are providing an expanded range of systems for environmentally sustainable and restorative wastewater treatment.

Additionally, resilience of potable water sources poses yet a growing challenge. Floods can overwhelm municipal potable water delivery infrastructure. Droughts can challenge reliability of water supply. Seismic events can damage water treatment and conveyance infrastructure. When communities are most vulnerable, access to potable water can be interrupted, causing public health crises. Healthcare services cannot continue uninterrupted without access to water supplies for handwashing, drinking, and, in some instances, operation of vital medical equipment.

This Water Guidance Document helps health care leaders make the changes needed to reduce their water consumption, responsibly treat wastewater and minimize the environmental impacts of storm water runoff by identifying specific actions that health care facilities can take. These actions are supported with links to case studies, and lists of specific Action Items that can be used to guide the development of solutions and measure progress towards reducing the environmental impact of new and existing health care buildings.

This document was produced in collaboration with Mazzetti, Foursight - an employee-owned benefit corporation providing Finance, Planning, Project Delivery, Research and Policy in a number of fields, including designing human-centered healthcare infrastructure. GGHH acknowledges the significant technical contribution made by Mazzetti, Foursight in developing this document, as well as the GGHH Energy and Waste documents. For more information see: http://www.mazzetti.com

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GLOBAL GREEN and HEALTHY HOSPITALS

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Overview

Over the past two centuries potable water use has grown twice as fast as the global population. Whereas two-thirds of the planet is covered by water, it is mostly saline and not directly usable by people or machines. In many areas of the world, in industrialized countries as well as in predominantly rural economies, the availability and use of fresh water is becoming more of a concern. In some areas, such as the southwest United States and in the Sahel, water scarcity has reached a crisis point. Whereas disparities in water consumption per person per day reflect levels of industrialization (compare the U.S. average consumption of 152 gallons per person per day with that of Burkina Faso at 7 gallons) there is also a significant difference between industrial nations, Germany consuming only 51 gallons per person per day, one third of the level of the United States.

Potable water treatment systems require significant community infrastructure, investment, and maintenance. Processing potable water is energy intensive and thus contributes to air emissions associated with fossil fuel energy generation (for the treatment, pumping, and maintenance of the potable water systems). In some municipalities, water treatment systems represent the highest energy demand over all other municipally-controlled energy use categories. In addition, potable water processing often includes the use of toxic disinfection chemicals such as chlorine. Finally, water heating can become a significant energy demand, particularly where piped hot water is constantly recirculating to avoid bacterial contamination.

High consumption rates of potable water places stress on lakes, aquifers, and waterways and can alter an entire ecosystem's functioning through the construction of dams or drawing so much water out of a river that it is unable to reach its natural terminus. The discharge of polluted water into these waterways can also seriously disrupt aquatic ecosystems. Sewage and wastewater effluent can pollute local ecologies through non-point sources (e.g., use of fertilizer and pesticides in landscaping), sanitary sewer overflows, stormwater sewer overflows, and hydrologic modifications (e.g., erosion or dredging).

In view of the increasing cost of water treatment and transport and as freshwater scarcity increases, there is increasing emphasis on matching water source quality to end use, recognizing that potable water is currently used for a range of end-uses that can in fact be handled by lesser quality water sources. Arid regions of the world are developing desalination facilities to treat saltwater (an energy intensive process) or installing reclaimed water systems to capture and divert wastewater flows to provide for a range of process uses.

There is also a shift toward viewing water not as a disposable commodity but as a precious element that can be recycled on site for multiple uses – and in the process reducing the volume of wastewater discharge and consequent processing costs. Many buildings are installing their own rainwater capture systems to reduce reliance on potable water sources for systems such as evaporative cooling towers or landscape irrigation.

According to the US Environmental Protection Agency, U.S. hospitals account for 7 percent of the total amount of water consumed by commercial and institutional facilities in the United States. Typically 35% of water consumption goes to domestic and restroom end uses; 20% to heating and cooling; and 15% to medical equipment. Another 23% of water usage is fairly evenly split between laundry, landscape and kitchen services with a remaining 7% attributed to 'other'. The wide variation of uses throughout a typical hospital offers a variety of opportunities for water consumption management, engaging all departments and personnel and, depending on the climatic zone and the availability of water as a natural resource, an opportunity to manage the use of water through any one or all of these functions.

Another key factor is the resilience of water management systems in times of emergency, both natural and man-made. Designing redundancy and reserve storage capacity into the supply and disposal systems to enable continued delivery of healthcare services during a water supply crisis is a key element of quality healthcare delivery.

Challenges

In many parts of the world, access to reliable potable water supply is a major challenge for healthcare facilities and the populations they serve. A key element of population health is access to high quality potable water; communities that lack access present a range of water-borne illnesses that stress healthcare delivery infrastructure. Hence, healthcare organizations can play an important role in advocating for reliable potable water access and infrastructure in their communities.

Without a reliable potable water delivery infrastructure system, hospitals must obtain and manage reliable potable water source(s), including on-site treatment, bottling and distribution systems. In areas of the world with more robust infrastructure, infection control concerns can pose a major challenge to domestic water conservation in hospitals, leading to regulations such as prohibiting piped, non-potable water systems. In addition, some conservation technologies, such as sensor controls for faucets and flush valves, have higher first costs (though are often favorable relative to life cycle costs) and may require an aggressive education and maintenance campaign to address concerns with facility managers, regulators, and others.

Wastewater discharge from hospitals presents a range of challenges. Where wastewater collection infrastructure is available, municipalities may express concern about medical contaminants ranging from chemicals to pharmaceuticals. Infectious disease hospitals, for example, may elect to provide on-site wastewater treatment and testing to ensure safe handling of infectious or biological agents. At the same time, recent developments in on-site wastewater treatment system technologies are providing an expanded range of systems for environmentally sustainable and restorative wastewater treatment.

Finally, resilience of potable water sources poses yet a final challenge. Floods can overwhelm municipal potable water delivery infrastructure. Droughts can challenge reliability of water supply. Seismic events can damage water treatment and conveyance infrastructure. When communities are most vulnerable, access to potable water can be interrupted, causing public health crises. Healthcare services cannot continue uninterrupted without access to water supplies for handwashing, drinking, and, in some instances, operation of vital medical equipment. Hence, hospitals must maintain uninterrupted water supplies, and can, in emergencies, become a valuable source of clean water within their communities.

Benefits

- Economic: Reduced water, sewer, and energy costs due to reduced potable water consumption and reduced need to heat water.
- Environmental: Decreased amount of water withdrawn from natural water bodies, protecting the natural water cycle and decreasing the strain on the municipal water supply. Reduced energy use and emissions associated with treating, supplying, and heating potable water.
- Health and Equity: Demonstrates good corporate citizenship, highlighting social, economic and environmental considerations at the heart of decision making.

Policy

Establish a framework that aspires to "net zero water use" within a hospital system.

A "net zero water building" is water-independent: it harvests rainwater and recycles its own wastewater for reuse. It eliminates the need for municipal water, exported sewage or storm water. It operates within the limits imposed by annual rainfall on a site and replenishes as much as it consumes. "Net-zero water" requires that:

100% of occupant's water use must come from captured precipitation or reused water that is appropriately purified without the use of chemicals.

100% of storm water and building water discharge must be handled on site.

Net-zero water implies that there is sufficient rainfall on the building site to satisfy make-up water supply needs. A net zero water Installation limits the consumption of freshwater resources and returns water back to the same watershed in order to maintain groundwater and surface water resources of the site and watershed in both quantity and quality over the course of a year. The net zero water strategy balances water availability and use to ensure sustainable water supply for years to come.

This concept is of increasing importance since scarcity of clean potable water is quickly becoming a serious issue in many areas of the world. The continued draw-down of major aquifers results in significant problems for our future. Strategies such as harvesting rain water and recycling discharge water for reuse can reduce the need for municipal water, exported sewage or storm water. Desalination can be utilized to convert briny, brackish or salt water to fresh water so it is suitable for human consumption or irrigation.

To achieve a net zero water installation, efforts begin with conservation followed by efficiency in use and improved integrity of distribution systems. Water is re-purposed by utilizing grey water generated from sources such as showers, sinks, and laundries and by capturing precipitation and storm water runoff for on-site use. Wastewater can be treated and reclaimed for other uses or recharged into groundwater aquifers. Committing to net zero water is an ambitious goal in healthcare, but an important one.

Action Items

- Develop a "net-zero water" team to research concepts
- Convene a charrette to create a plan, research partnerships, and confirm goals
- Begin with water conservation; then move into water supply options.
- Understand and consider regulatory issues regarding on-site water quality

About Health Care Without Harm

Health Care Without Harm is an international coalition of more than 500 members in 53 countries that works to transform the health care sector so that it is no longer a source of harm to human health and the environment.

We collaborate with doctors, nurses, hospitals, healthcare systems, professional associations, NGOs, governments and international organizations to promote the development and implementation of safe and environmentally healthy practices, processes and products in the health care sector.

HCWH has regional offices in the United States, Latin America, Europe and South East Asia as well as strategic partners in South Asia and Africa.

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