



INDIAN HEALTH SERVICE

2012

SUSTAINABILITY



ANNUAL PROGRESS REPORT



Message from Chief Sustainability Officer, Gary Hartz

Welcome to the Indian Health Service (IHS) fiscal year (FY) 2012 Sustainability Annual Progress Report. This is the second annual report that IHS has published with the purpose of communicating (externally and internally) the sustainability activities and accomplishments of IHS staff at all organizational levels. This report focuses on those accomplishments related to stewardship of the environment and implementation of sustainable practices in agency operations. The report also shares the achievements of staff and teams for their contribution to sustainability, such as those that received Department of Health and Human Services Green Champion Awards. Furthermore, this report helps IHS maintain accountability for and transparency of the impact of our actions, and it facilitates our efforts to address the President's Executive Orders regarding environmental sustainability.

We live in a time in which increased population growth, high levels of consumption, and the desire to feed growing economies have created escalating demands on our natural and social resources, on a local, regional, and global scale. IHS is doing its part to reduce the demands on those resources. Each IHS Area Office is encouraged to work on sustainability priorities, including energy and water conservation, waste reduction, sustainable acquisitions, sustainable buildings, and electronics stewardship. This year has seen many successes within these areas.

This 2012 report highlights our success in reducing ecological impacts, especially those relating to energy, water, and waste. The report also features some special IHS and tribal programs and projects—namely those performed by the Alaska Native Tribal Health Consortium in the area of IHS water and sewer utilities and renewable energy; IHS employee Holly Thompson in the area of Integrated Pest Management; and Upper Sioux Community member Theresa Villebrun in the area of recycling and green procurement. The report goes on to explore new construction and renovation of existing facilities that helped us achieve sustainability goals, and the various communication and outreach updates in which our Sustainability Team engaged. Finally, we look forward to some of the efforts IHS will initiate in FY2013.

I hope you enjoy reading about IHS's 2012 sustainability program activities and successes. I welcome your input into how we can better serve the American Indian and Alaska Native people and further demonstrate our commitment to the IHS Mission while operating in harmony with the planet that sustains us.

Gary J. Hartz, P.E., BCEE
Chief Sustainability Officer
Indian Health Service





List of Abbreviations

Alaska Native Medical Center (ANMC)	Environmental Management Systems (EMS)	Million British thermal units (mmBtu)
Alaska Native Tribal Health Consortium (ANTHC)	Environmental Protection Agency (EPA)	Office of Environmental Health and Engineering (OEHE)
Alaska Rural Utility Collaborative (ARUC)	Environmental Steering Committee (ESC)	Office of Management and Budget (OMB)
American Recovery and Reinvestment Act of 2009 (ARRA)	Executive Order (EO)	Operational Division (OPDIV)
Billion British thermal units (BBtu)	Fiscal Year (FY)	Photovoltaic system (PV system)
British thermal units (Btu)	General Services Administration (GSA)	Renewable Energy Credit/certificate (REC)
Building Information Modeling (BIM)	Greenhouse Gas (GHG)	Strategic Sustainability Performance Plan (SSPP)
Bureau of Indian Affairs (BIA)	Ground Source Heat Pumps (GSHP)	Sustainability Advisory Board (SAB)
Carbon Footprint Tool (CFT)	Gross square feet (gsf)	Sustainability Implementation Plan (SIP)
Chief Sustainability Officer (CSO)	Healthcare Facilities Data System (HFDS)	Water Conservation Measure (WCM)
Chlorofluorocarbon (CFC)	Heating, ventilation, and air conditioning (HVAC)	Watt (W)
Compliance Tracking System (CTS)	IHS Architectural/Engineering Design Guide (A/E Design Guide)	
Construction and demolition (C&D)	Indian Health Service (IHS)	
Department of Energy (DOE)	Integrated pest management (IPM)	
Department of Health and Human Services (DHHS)	International Organization for Standardization (ISO)	
Energy conservation measures (ECM)	Kilowatt (kW)	
Energy Independence and Security Act of 2007 (EISA 2007)	Kilowatt hours (kWh)	
Energy Policy Act of 2005 (EPAAct 2005)	Leadership in Energy and Environmental Design (LEED)	
Engineering Services (ES)	Megawatt hours (MWh)	
Environmental Health Support Center (EHSC)	Memorandum of Understanding (MOU)	



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What is Sustainability?

Sustainability is a concept that wholeheartedly supports the IHS Mission to “raise the physical, mental, social, and spiritual health of American Indians and Alaska Natives to the highest level.” According to Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance, to make something “sustainable” means “to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations.” While many other specific definitions for the term “sustainability” exist, they all relate to reducing energy, conserving water, minimizing waste, purchasing environmentally preferable products and services, implementing sustainable building practices, and changing individual behaviors to protect the environment for ourselves and our children.

Energy: Energy supplies are precious resources that are in extremely high demand. Conventional energy sources such as petroleum and natural gas are not renewable. This means that as we consume, they diminish without being readily renewed. This causes prices to increase as resources become scarcer. By conserving energy and using alternative fuels—particularly those that are renewable—IHS staff help achieve energy independence and conserve resources at the same time.

Water: Water—especially clean water—is another precious resource. Treating water to make it safe to drink, or treating water after it has become wastewater, uses a significant amount of energy and many toxic chemicals. Properly handling stormwater and reducing water consumption consequently helps reduce energy and chemical use. IHS staff helps in these efforts by ensuring the use of water-efficient devices and implementing best management practices outdoors to protect stormwater quality.

Waste: The best way to deal with waste is not to produce any at all, but it is more realistic, especially for healthcare facilities, to instead work on producing less of it. This can be done through various pollution prevention and source reduction activities. Many IHS locations are reducing solid waste, reusing

products, and recycling batteries, paper, plastics, fluorescent bulbs, precious metals, and aluminum cans. Purchasing is an important component of any waste reduction strategy, too, since certain materials are more easily disposed of than others.

Purchasing: If a product or service is needed, then environmentally preferable purchasing practices should be employed to acquire products or services that conserve energy and/or water; last a long time and/or are easily recyclable; are nontoxic or less toxic; are biobased; are non-ozone depleting; and/or are made from recycled content. IHS contracting officers and those authorized to purchase products and services are informed of which items are environmentally preferable and where to purchase them.

Buildings: In the United States, according to the U.S. Green Building Council, buildings account for 36 percent of total energy use, 65 percent of electricity consumption, 30 percent of greenhouse gas (GHG) emissions, 30 percent of raw materials use, 30 percent of waste output (136 million tons annually), and 12 percent of potable water consumption. Reducing a building’s environmental footprint through proper design, construction, operation and management, maintenance, and de-construction/demolition goes a long way in helping to protect the environment. In existing facilities, IHS facility managers use the results from energy and water audits and GHG inventories to modify building operations, management, and maintenance to become more sustainable.

Individual Behaviors: Sustainability ultimately comes down to changing individual behaviors in the workplace and at home. Improvement in technology can only go so far in reducing our environmental impact; that technology still needs to be turned on, maintained, and used properly and efficiently. IHS staff institutes policies, trains and educates fellow staff, provides feedback, and even uses friendly competitions to change individual behaviors to become more sustainable.





Introduction to Sustainability: Federal Regulations

The implementation of sustainable practices at IHS is based on laws and regulations that outline sustainability goals for federal agencies. In the past ten years, there has been increasing government-wide focus on reducing energy and water use in federal operations.

In January 2007, President George Bush signed Executive Order (EO) 13423, “Strengthening Federal Environmental, Energy and Transportation Management,” which directed federal agencies to conduct their environmental, transportation, and energy-related activities in an environmentally and fiscally sound manner. The EO requires agencies to implement Environmental Management Systems as the framework in which to manage and continually improve sustainable practices. The EO also set other key goals in the previously mentioned sustainability-related areas.

In October 2009, President Barack Obama signed EO 13514, “Federal Leadership in Environmental, Energy, and Economic Performance,” which augmented EO 13423 requirements and also created new requirements. EO 13514 directs federal agencies to reduce their greenhouse gas emissions; meet a number of energy, water, and waste reduction targets; participate in regional and local planning activities; and leverage federal purchasing power to promote environmentally responsible products and technologies. Specific targets for reductions in energy use, water consumption, and waste production, as outlined by EO 13514, guide the objectives for each federal department. Targets include:

- 30 percent reduction in vehicle fleet petroleum use by 2020, from a 2005 baseline;
- 26 percent improvement in water efficiency by 2020, from a 2007 baseline;
- 50 percent recycling and waste diversion by 2015;
- Compliance with sustainability requirements for 95 percent of applicable purchasing contracts;
- 100% of all new federal buildings achieving zero-net-energy by 2030;
- Implementation of the stormwater provisions outlined in the Energy Independence and Security Act of 2007, Section 438; and
- Development of guidance for sustainable federal building locations in alignment with the Livability Principles put forward by the Department of Housing and Urban Development, the Department of Transportation, and the Environmental Protection Agency.

Other federal performance targets were promulgated through Energy Independence and Security Act of 2007 (EISA 2007) and the Energy Policy Act of 2005 (EPAAct 2005). Taken together, these laws and Executive Orders influence federal agencies and how they should operate with respect to environmental sustainability.

Technical Resources

Many resources are used to develop the targets and standards that IHS works toward regarding energy and water use, and sustainable buildings. A few of the most frequently utilized resources are described below.

Leadership in Energy and Environmental Design, commonly referred to as “LEED,” consists of a suite of rating systems for the design, construction and operation of high performance green buildings, homes, and neighborhoods. In order to be certified, buildings have to meet certain criteria and targets that are specifically set for the category of building. Some of those criteria and targets cover the following areas:

- **Sustainable site** credits encourage strategies that minimize the impact on ecosystems and water resources;
- **Water efficiency** credits promote smarter use of water, inside and out, to reduce potable water consumption;
- **Energy & atmosphere** credits promote better building energy performance through innovative strategies;
- **Materials & resource** credits encourage using sustainable building materials and reducing waste; and
- **Indoor environmental quality** credits promote better indoor air quality and access to daylight and outside scenery views.¹

The *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings* (*Guiding Principles*) are a set of established criteria that requires federal agencies to demonstrate “federal leadership in the design, construction, and operation of High-Performance and Sustainable Buildings.”

¹ <http://new.usgbc.org/leed/rating-systems>

The Guiding Principles outlines the following guidelines for federal agency buildings:

- Employ Integrated Assessment, Operation, and Management Principles
- Optimize Energy Performance
- Protect and Conserve Water
- Enhance Indoor Environmental Quality
- Reduce Environmental Impact of Materials

The IHS Office of Environmental Health and Engineering (OEHE) Architectural/Engineering Design Guide (A/E Design Guide) describes requirements for the design and construction of federally funded IHS projects. The A/E Design Guide includes sustainability language for new and existing construction. The A/E Design Guide’s sustainability chapter proposes “sustainability requirements to ensure that IHS facilities are designed and constructed in a manner that enhances indoor environmental quality for users while reducing the production and consumption of greenhouse gases and disposal of construction material.” The general requirements outlined in the A/E Design Guide incorporate the Guiding Principles listed previously, as well as, LEED Certification.





The OEHE Technical Handbook is a guidance document intended to support and implement IHS policy. The OEHE Technical Handbook was developed to set standards and regulations for all aspects of technical services that IHS provides. This handbook was modified in 2012 to include sustainability requirements regarding construction and demolition waste and diversion and recycling expectations.

The Environmental Protection Agency (EPA) ENERGY STAR program provides guidelines for building energy standards. The program offers an online tool, “Portfolio Manager,” to measure and track the energy use of any building. To qualify for the ENERGY STAR, a building must earn a 75 or higher on EPA’s 1-100 energy performance scale, indicating that the facility performs better than at least 75 percent of similar buildings nationwide. The ENERGY STAR performance scale accounts for differences in operating conditions, regional weather data, and other important considerations. By reaching this standard, it indicates the building has met national standards for energy efficiency.

Construction of the Barrow Hospital in Barrow, AK - December 2011 ►



IHS Operational Environmental Management System Structure

For many years and in varying degrees, IHS has been implementing the core elements of an Environmental Management System (EMS) that meets the International Organization for Standardization (ISO) ISO 14001 Standard EMS framework. ISO 14001 is a group of standards regarding environmental management, legal compliance, and continual improvement in operations. In FY2011, site-specific EMS evolved into the current Organizational EMS, indicating that there is now a single IHS EMS that encompasses the operations of the entire agency. In FY2012, IHS operated its sustainability initiatives through the Organizational EMS.

Key elements of the IHS Organizational EMS include:

- Implementing an environmental sustainability policy;
- Establishing sustainability objectives and targets through the Department of Health and Human Services' Strategic Sustainability Performance Plan and the IHS Sustainability Implementation Plan;
- Implementing and tracking sustainability goals through the Sustainability Advisory Board;
- Conducting regular environmental, greenhouse gas (GHG), and sustainability audits;
- Ensuring that all staff receive appropriate environmental training;
- Performing an annual EMS Management Review; and
- Communicating through the Annual Progress Report and recognition opportunities.

SUSTAINABILITY PLANS AND POLICIES

IHS instituted a new environmental policy directive titled “Environmental Compliance, Stewardship, and Sustainability.” This issuance establishes the policy, procedures, and responsibilities for managing environmental compliance, stewardship, and sustainability objectives within IHS.

In FY2010, the DHHS began to evaluate the relationship between the sustainability mandates of Executive Order (EO) 13514 and the DHHS Mission to improve the national performance of leading health indicators and healthcare outcomes. Based on this evaluation, the DHHS developed its inaugural Strategic Sustainability Performance Plan (SSPP), which was enacted by Secretary Kathleen Sebelius later in 2010. The SSPP formulated goals that help meet EO mandates and maximize the ability to integrate sustainability into all Departmental and Mission programs.

To support the original SSPP, sustainability workgroups were established to steer the development of Department-wide objectives and implementation strategies within each of the main goal areas of the SSPP. These workgroups, which continue to meet regularly, are made up of representatives from each of the major landholding operating divisions (OPDIVs). At least one IHS representative participates in each of the workgroups.

AGENCY GOAL AREAS

- 1 Scope 1 & 2 Greenhouse Gas Reduction**
- 2 Scope 3 Greenhouse Gas Reduction & Develop and Maintain Agency Comprehensive Greenhouse Gas Inventory**
- 3 High-Performance Sustainable Design / Green Buildings & Regional and Local Planning**
- 4 Water Use Efficiency and Management**
- 5 Pollution Prevention and Waste Reduction**
- 6 Sustainable Acquisition**
- 7 Electronic Stewardship and Data Centers**
- 8 Agency Innovation & Government-Wide Support**



In FY2011, each agency in DHHS was tasked with preparing OPDIV-specific Sustainability Implementation Plan (SIP) for each of the main goal areas. These SIPs are to conform to the goals set in the DHHS SSPP, and to reflect the unique operations and characteristics of IHS. The SIP includes IHS-specific goals for advancing environmental sustainability and strategies and plans for 2011 and beyond . In FY2012, IHS applied the lessons learned from creating the 2011 SIP and developed a more detailed SIP; this same process will be followed in FY2013. The SSPP and SIP targets and goals contribute to the framework of the IHS Organizational EMS.

IHS SUSTAINABILITY ADVISORY BOARD (SAB)

The IHS SAB, chaired by IHS CSO Gary Hartz, was formed to ensure a coordinated, multi-office approach to implementing sustainability initiatives. The SAB also ensures that IHS is meeting the DHHS SSPP goals and targets, and supports the CSO with implementing IHS environmental sustainability initiatives as outlined in the IHS SIP. Additional high-level objectives are to promote environmental sustainability as a way of doing business, while emphasizing return-on-investment benefits, and to ensure that IHS planning incorporates practices that support sustainability needs.

During SAB quarterly meetings, members discuss updates from DHHS sustainability workgroups, progress on IHS sustainability goals, current challenges, and all upcoming events and deadlines. These quarterly meetings will continue through FY2013.

CURRENT SAB MEMBERS

Deputy Director for Operations	Bob McSwain
Chief Sustainability Officer	Gary Hartz
Deputy Chief Sustainability Officer	CAPT Gordon Delchamps
Electronic Stewardship/Data Consolidation Manager	Ken Johnson
Energy/Water Manager	CAPT Gordon Delchamps
Environmental Manager	Steve Aoyama
Fleet Manager	Patricia Spuck
Green Procurement Manager	Dale Burson
Pollution Prevention/Waste Manager	CAPT Kelly Taylor
GHG Scope 3 Manager	Chris Jones and Loa Girty
Sustainable Green Buildings Manager	Joe Bermes
Regional and Local Planning Manager	CAPT Steve Raynor
Sustainability Outreach/Communications Manager	Constance James
Area Director (rotating)	To be determined
Service Unit Chief Executive Officer (rotating)	To be determined
Clinician	To be determined



SUSTAINABILITY AUDITS

Beginning in FY2011 and continuing through FY2013, the Office of Environmental Health and Engineering (OEHE) implemented an agency-wide project to conduct comprehensive sustainability audits to support the Operational EMS objectives. These audits include energy and water audits, GHG inventories, and sustainability assessments. Ultimately, this project will identify new opportunities and strategies that will save money and lessen the overall IHS environmental footprint. Many of the audit reports have been completed, and Areas have begun requesting funding to implement some of the recommendations.

ENVIRONMENTAL STEERING COMMITTEE

The IHS Environmental Steering Committee (ESC) includes OEHE staff throughout the country who review funding applications for sustainability, environmental remediation, and demolition projects. The ESC is tasked with managing the environmental remediation funding and actions at healthcare facilities. ESC responsibilities include determining project priorities and monitoring corrective actions. The ESC prioritizes and funds those projects emphasizing sustainable practices.

In 2012, a total of 23 Project Summary Descriptions were submitted to the ESC for funding consideration, including 8 environmental projects, 1 demolition project, 6 environmental and demolition combined projects, and 10 sustainability projects. The ESC has an annual budget of \$3 million to allocate to future projects.

Photovoltaic (PV) solar panel system at Santa Rosa Health Center. This is one of the projects that was partially funded by Environmental Steering Committee funds. ►





Projects are divided into categories that include sustainability, demolition, or environmental remediation. Many of the demolition, replacement, or building modification projects are funded to properly manage lead, asbestos, and other hazardous materials found in the buildings. A list of ESC-funded projects is listed in the adjacent table.

Many demolition, replacement, or building modification projects are funded to properly manage lead, asbestos, and other hazardous materials found in the buildings.

FUNDED PROJECT	AMOUNT FUNDED
Pine Ridge Old Hospital Demolition	\$1,930,000
Address Sustainability Audit Findings at Red Lake Service Unit	\$855,947
Replace Underground Storage Tank with Aboveground at Shiprock Service Unit	\$400,000
Environmental Assessment of Navajo Nation Buildings	\$300,000
Santa Rosa Solar Panels Project	\$160,000
Install Meters for Energy and Water Use at the Yukon Kuskokwim Regional Hospital	\$120,890
Replace Underground Storage Tank with Aboveground at Dzilth-Na-O-Dith-Hle	\$120,000
Crow Hospital Sustainability Project	\$83,600
Install Smart Meters at Parker, Polacca, Phoenix, and Whiteriver Service Units	\$75,000
Demolition of Four Buildings at Lawton Indian Hospital	\$69,500
Install Energy Efficient Lighting at Inscription House	\$65,000
Environmental Remediation of Asbestos at Quayana Clubhouse	\$53,800
Replace Landscaping with Xeriscaping at Tuba City	\$50,000
Desert Visions Youth Regional Treatment Centers Solar Water Heating at Sacaton	\$42,500
Environmental Remediation and Demolition of Building at Fort Peck	\$40,000
Demolish Whiteriver Warehouse Building and Shed	\$30,000
Replaced San Xavier Modular Buildings	\$2,500
Total	\$4,398,737



OUTREACH AND COMMUNICATIONS

The OEHE Team engaged in several outreach and communications initiatives in FY2012, including creating a website to highlight and share issues regarding sustainability; introduce IHS’s sustainability initiatives; and announce events and trainings related to sustainability. Visit the website at: <http://www.ihs.gov/sustainability/>.

Also on the website, the OEHE Team posts monthly green tips that recommend easy, daily activities that people can do to be more sustainable in their homes or workplaces. The Team also created a listserv to send updates, interesting links, and information on sustainability events and trainings.

To spread sustainability awareness, the OEHE Team started a new webinar series on sustainability that highlights topics such as ENERGY STAR certification, food security, and renewable energy. These webinars are planned monthly through FY2013, and you can sign up for them at the IHS Environmental Health Support Center (EHSC) at <http://www.ihs.gov/EHSC/>. Webinars have been emphasized as a more cost-effective method of training. Holding webinars also reduces GHG emissions associated with traveling

for training. In addition to the webinar series, IHS staff are encouraged to seek other sources for training, such as ENERGY STAR, Federal Energy Management Program, Department of Energy’s Office of Energy Efficiency and Renewable Energy, and EHSC.

Recognition is also encouraged at IHS. DHHS created the Green Champion Awards Program to award OPDIV-level staff for their sustainability-related work. Previous IHS winners were presented in last year’s annual report, and can also be seen at: http://www.ihs.gov/sustainability/index.cfm?module=dsp_evss_DHHS_gha_2010 and http://www.ihs.gov/sustainability/index.cfm?module=dsp_evss_DHHS_gha_2011. These achievements recognized by the Green Champion Award further the impact of the EMS.

In 2012, Green Champion Awards were given to the following: the IHS Sustainability Audits; the Division of Environmental Health and Engineering Energy Program, and their Campus Lighting upgrade; and the Santa Rosa Solar Photo Voltaic project. The full descriptions can be found at: http://www.ihs.gov/sustainability/index.cfm?module=dsp_evss_hhs_gha_2012



To receive updates, links and information on sustainability, training, and initiatives, sign up for listserv by emailing:

CAPT David McMahon at David.McMahon@ihs.gov or
Lauren Senchack at Lauren.Senchack@ihs.gov

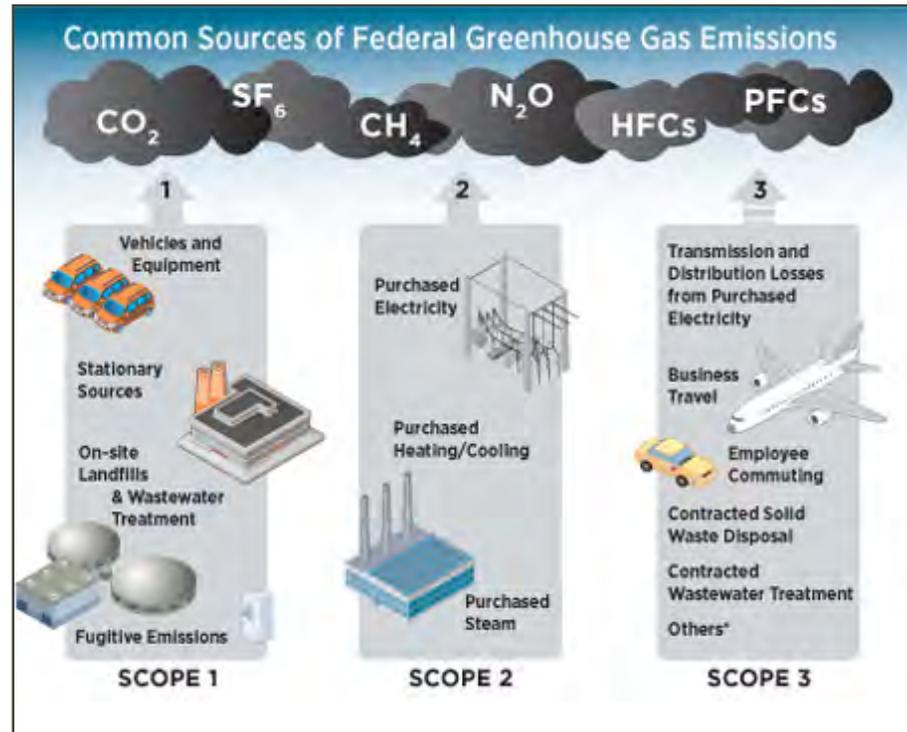
“Buying green” is one of the green tips that the sustainability webpage sends out via the listserv and also via both the IHS and DHHS homepages.



IHS' Energy Performance

The IHS portfolio includes more than six million square feet of federally-operated space that annually reports energy use. In FY2012, IHS spent more than \$21 million dollars on energy for the buildings that report energy use, which is a reduction from the \$25 million dollars spent in FY2011. This reduction of nearly \$4 million represents IHS's commitment to reducing energy use intensity throughout agency's building portfolio.

In addition to reducing energy use, IHS is committed to reducing GHG emissions. Each fiscal year, federal agencies develop an inventory of their Scope 1, Scope 2, and specified Scope 3 GHG emissions. Federal agencies are expected to establish and meet GHG emissions reduction targets by FY2020, relative to a FY2008 baseline. For the DHHS, this target is 10.3 percent reduction for Scope 1 and 2 emissions, and 3 percent reduction for Scope 3 emissions. IHS emitted 126,955 tons of carbon dioxide (CO₂) in 2012, which is a significant decrease from the 144,505 tons of CO₂ produced in the baseline year of 2008.



nearly \$4 million saved

In FY2012, IHS reported an energy savings of nearly \$4 million dollars for buildings that report energy use, this was down from FY2011

▲ This image depicts the differences between the Scope 1, 2, and 3 emissions and what activities produce those emissions.

77,550 tons of CO₂ decreased

In 2012, IHS reported a decrease of 77,550 tons of CO₂, down from the baseline year of 2008



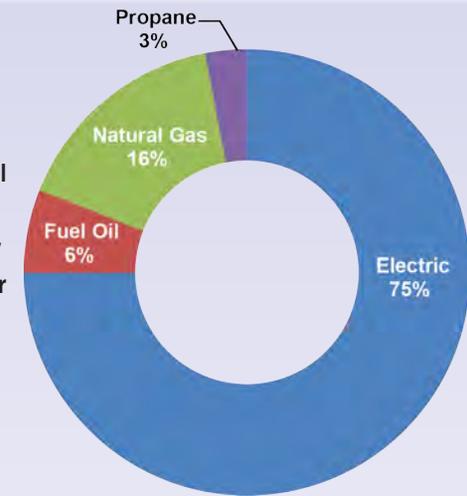
IHS reports its energy consumption to DHHS annually. IHS also monitors its progress toward meeting the energy reduction goals outlined in the 2012 IHS Sustainability Implementation Plan (SIP). This includes an evaluation of the agency’s performance against a 2003 baseline. In FY2003, IHS consumed a total of 1.31 million British thermal units (mmBtu), or nearly 200,000 British thermal units (Btu) per gross square foot (Btu/gsf). In FY2012, IHS consumed a total of 1.08 mmBtu, or 178,373 Btu/gsf, for a decrease of 10.6 percent against the 2003 baseline.

The table below shows the energy use intensity of energy use at IHS in 2011 and 2012 as compared to the baseline year of FY2003. It also shows the percent change between the current year and baseline, and between the current year and previous year.

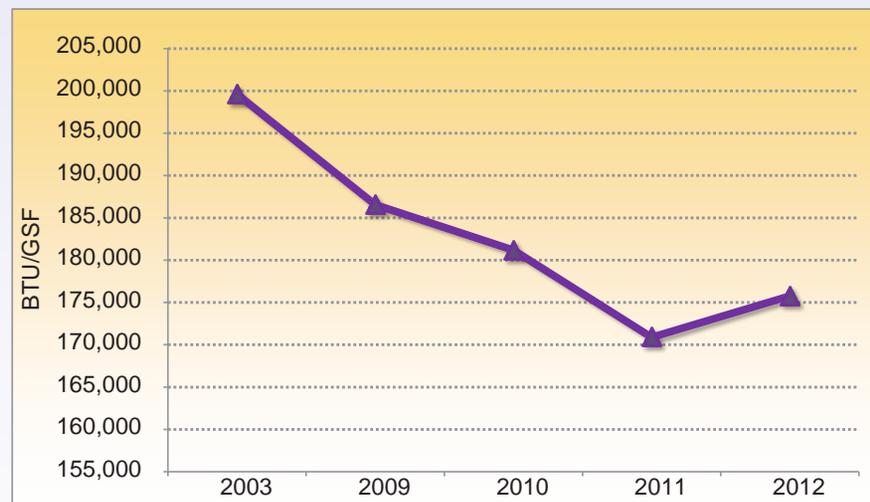
YEAR	ENERGY INTENSITY
FY-2003	199,616 Btu/gsf
FY-2011	170,214 Btu/gsf
FY-2012	178,373 Btu/gsf
% change FY2003-FY2012	10.6% decrease
% change FY2011-FY2012	4.8% increase

GHG CONTRIBUTIONS

This pie chart shows the percentage of GHG emissions that were produced by each fuel type in FY2012. The majority of GHG emissions were created by electricity, with natural gas a far second.



The line graph below shows the energy use intensity, or energy use per square footage, from FY2009-FY2012 with a set baseline of FY2003. As is evident, there has been a considerable decrease in energy use since FY2003.



ENERGY MANAGEMENT

At IHS, energy is managed by the 12 Area Offices and two Engineering Services Offices. Each Area OEHE Director has designated a collateral duty Energy Manager who manages the energy use. The Area Energy Managers use numerous methods and tools to further IHS efforts and progress in tracking and recording fuel and electricity consumption, including the following tools.

Portfolio Manager: In 2012, IHS began to benchmark its portfolio of buildings—which includes nearly 2,300 buildings with 600 energy and water meters—in the EPA ENERGY STAR online tool Portfolio Manager. As mentioned in the Technical Resources section, this tool is an interactive energy management tool that allows users to track and assess energy and water consumption on a per-building basis, across an entire portfolio of buildings, in a secure online environment. Owned or managed facilities use Portfolio Manager to identify buildings that are under-performing, to verify efficiency improvements, and to receive EPA recognition for superior energy performance. Facilities that benchmark their energy/water use in Portfolio Manager, receive the ENERGY STAR certification for performing efficiently. Using this tool streamlines the energy reporting and Department of Energy (DOE) compliance process.

Carbon Footprint Tool: In addition to using the Portfolio Manager tool, IHS participated in a pilot program using the General Services Administration’s Carbon Footprint Tool (CFT). Similar to EPA’s Portfolio Manager, this tool tracks and records energy and water information. The CFT data is directly downloadable into the annual energy and water use reporting tool required for DOE’s Federal Energy Management Program. IHS is participating in the ongoing CFT pilot program to ensure that IHS’s energy and water data is being properly managed and to make energy management easier for Headquarters and the Areas.

Other Tools: IHS uses other tools to manage its energy usage, including the DOE Compliance Tracking System (CTS) and the IHS Healthcare Facilities Data System (HFDS). Both of these tools help IHS follow federal regulations on reporting. Using CTS is required by EISA 2007, Section 432, to track agency performance relating to energy and water evaluations, project implementation and follow-up measures, and annual building benchmarking requirements. The IHS-owned system, HFDS, helps facility managers manage data and capture required information. If any new regulations are developed, IHS integrates these into the various existing databases.

Blackfeet Hospital is an example of an IHS hospital that has earned the ENERGY STAR certification. In order to achieve the certification, the building must score above a 75 on the ENERGY STAR performance scale, which rates a building’s energy performance from 1-100. The performance score determines how energy efficient the building is compared to other similar building types. ►





TUCSON AREA

- At **Sells Indian Hospital**, the ENERGY STAR score increased from 78 to 95 in the last two years, primarily due to upgraded heating, ventilation, and air conditioning (HVAC) systems and increased use of evaporative cooling. This increase in energy efficiency is a significant achievement, and the Hospital is now eligible for an ENERGY STAR.

BEMIDJI AREA

- The addition at **Red Lake Hospital**, completed in 2012, was designed to consume 30 percent less energy than a facility of similar size. In 2012, Red Lake Hospital reduced its energy use by 21 percent compared to a baseline of 2003. Based on findings from the audits performed in 2012, the Hospital is anticipating completing two projects in FY2013: 1) a temperature management project for \$2,000 with estimated savings of \$26,500 and 1,100 mmBtu in energy; and 2) a filter change project for \$900 with estimated savings of \$4,800 and 186 mmBtu in energy.
- **Red Lake Hospital** also completed a project in which they replaced parking lot lighting, which was estimated to save \$3,500 and 161 mmBtu in energy annually. The project replaced existing mercury vapor lamps and high-pressure sodium lamps with induction lamps. The actual savings are unknown, but the overall reduction in energy use at the facility continues.



▲ *Sells Indian Hospital has increased its EPA ENERGY STAR performance score from 78 to 95.*

New induction parking lot lighting at Red Lake Hospital. ►





▲ *Cass Lake performed a window replacement project that has seen energy reductions because of better insulation.*

- **Cass Lake Hospital** saw a 26 percent reduction in energy use this year. A window replacement project contributed to the energy reduction due to increased insulation and less escaped heat. In early spring, there was a large decrease in the consumption of natural gas, which is used for heating the facility. Also, the Hospital completed a project in which the 55-kilowatt (kW) generator was replaced with a 100-kW unit. The new generator is used occasionally for peak load shaving, which saves energy and money.

26% reduction in energy use

There was a window replacement project that contributed to the energy reduction due to increased insulation and less escaped heat.



ALASKA AREA

- At **Maniilaq Health Center**, the exterior lighting in the parking lots was converted from high-pressure sodium to light-emitting diode (commonly known as “LED”) fixtures. The power consumption was reduced from 300 Watts (W) down to 139 W per fixture. The project will save the Maniilaq Health Center approximately \$15,000 per year in electricity costs. As depicted in the before and after images, the project had a significant improvement on the visibility of the parking lot.
- The **Yukon-Kuskokwim Health Corporation** underwent a roof replacement, which included the addition of new insulation. The project is estimated to result in a 30 percent savings in energy compared to the 2003. This project earned an Honorable Mention in the 2012 Green Champion Awards.



▲ Parking lot of Maniilaq Health Center- Before lighting retrofit



▲ Parking lot at Maniilaq Health Center – After lighting retrofit.
As one can see, there is a significant improvement in visibility

ABERDEEN AREA

- The new 138,000-gsf healthcare facility in **Eagle Butte**, South Dakota, was designed and constructed with an ENERGY STAR reduction target of 30 percent more efficient than an average facility of its kind. Since occupancy in January 2012, the facility is on track to achieve 77,000 Btu/gsf, which is considerably lower energy intensity than other in-patient facilities in the Aberdeen Area. The heating and cooling loads of the new facility are met with geothermal water-to-water heat pumps as well as a sophisticated electronic building automation system to control the heat pumps and ventilation units.
- Also at **Eagle Butte Service Unit**, the quarters were built “Designed to Earn the ENERGY STAR.” Construction included the independent Home Energy Rating inspection and testing to verify compliance with the ENERGY STAR requirements. All 133 units feature geothermal heat pumps for primary heating and cooling, ENERGY STAR appliances, basements constructed with insulated concrete forms, exterior walls constructed with 5.5 foot structural insulated panels, and fire suppression/sprinkler systems.



▲ The new healthcare facility at Eagle Butte



◀ Construction of the quarters at Eagle Butte Service Unit. The quarters were built Designed to Earn the ENERGY STAR.



OKLAHOMA CITY AREA

- The **Lawton Indian Hospital** expansions improved the energy efficiency of both facilities in 2012. The Lawton Hospital expansion was the first LEED-certified building expansion in IHS. Also, the boiler replacement at Lawton made a significant impact on the Hospital's natural gas consumption rate.
- The Oklahoma City Area performed a complete replacement of a 20-year-old HVAC system at the **Anadarko Indian Health Center**. This project included replacing two inefficient air handler units connected to two old, small hydronic boiler systems used for heating, as well as two large chiller units used for cooling. This project incorporated replacement of outdated units with 10 intelligent and energy efficient standalone rooftop units. These improvements are providing significant improvement in comfort level for the patients and staff, with additional potential energy usage savings. The new HVAC system in Anadarko was completed in July 2012, and when comparing August-October 2012 energy use with August-October 2010, a 21 percent decrease in energy use is shown.

PHOENIX AREA

- In the Phoenix Area, several energy conservation measures recommended during the energy audit at the **Parker Health Center** facility have been implemented. These included correcting the settings on the hot water and chilled water air separator; correcting the air handler unit condensate traps; improving the conference room duct work; repairing stem wall leaks; replacing pump overload heaters; and installing medical records lighting controls.
- Several energy conservation measures at **Hopi Health Care Center** are under way, including air handler repair; fire smoke damper repair; return fan noise abatement; air handler unit condensate trap repair; air handler unit isolation damper service; boiler upgrade; and installation of variable fan drivers on hot water pumps.



▲ *The former boiler at the Hopi, before it was replaced. This is an energy conservation measure that was completed in FY2012.*



The newly installed boilers at the new Hopi, which have increased efficiency in the facility. ►

RENEWABLE ENERGY AT IHS

IHS both purchased and generated renewable energy in 2012, including wind, solar, and geothermal. Renewable energy targets were met either by generating renewable energy or by purchasing renewable energy credits (RECs) that count toward the renewable energy target. A REC is a tradable environmental commodity that represents the added value, environmental benefits, and cost of renewable energy above conventional methods of producing electricity, namely burning coal and natural gas. The owner of a REC can claim to have purchased renewable energy.

In 2012, IHS made significant strides to meet the renewable energy target outlined in the SIP, which states that 10 percent of the anticipated electricity use in FY2012 should be attributed to renewable energy either generated or purchased for consumption. IHS exceeded this goal by using 12.9 percent renewable energy in FY2012. IHS advocates for implementation of renewable energy technology wherever feasible and cost effective.

Beginning in September 2010, IHS set a goal that all new construction project budgets should reserve two percent of construction cost for the investigation, design, and construction of on-site renewable energy systems capable of providing at least 7.5 percent of the annual electrical load. If 7.5 percent is not feasible, the system with the maximum capacity feasible shall be incorporated into the project. IHS also sets a goal that all new construction projects investigate, design, and construct solar water heating systems capable of delivering 30 percent of the hot water demand. Both requirements have been incorporated into the IHS Architectural/Engineering Design Guide (A/E Design Guide) for all future projects.

Currently, the OEHE Engineering Services Division is managing two projects at Ft. Yuma Service Unit and Kayenta Health Care Center that will include 19-kW (2.5 percent of annual electrical load) and 77-kW (2.5 percent of annual electrical load) photovoltaic systems (PV), respectively.



◀ Wind turbines in Elim, Alaska. This is a renewable energy community project completed by the Alaska Native Tribal Health Consortium (ANTHC) and staff at Goodnews Bay



ABERDEEN AREA

- In South Dakota, Ground Source Heat Pumps (GSHPs) are used extensively on projects managed by Engineering Services. In 2012, the **Cheyenne River Health Center** and the accompanying staff quarters (under construction) have incorporated the use of GSHPs in their designs. This technique transfers heat from the earth, which is a renewable source.
- The Aberdeen Area implemented renewable energy improvements at the **Pine Ridge Indian Hospital** and **Rosebud Indian Hospital**. Pine Ridge installed PV arrays (10 kW) and Rosebud installed a small wind (50 kW) system. The PV array at Pine Ridge became operational in March 2012, and since then, has produced approximately 13,500 kilowatt hours (kWh) of electrical energy. This unit is not separately metered, so the exact savings are unknown, but overall the PV system has helped reduced the amount of renewable energy the Area purchases.



◀ *The solar panels installed at Pine Ridge Hospital.*

PORTLAND AREA

- In the **Portland Area**, solar fans were installed to ventilate the attic space at the **Yakama Service Unit**. It is estimated that the new fans will help significantly reduce cooling loads during the summer months.

TUCSON AREA

- At **Santa Rosa Health Center**, a 57-kW PV array was installed and became operational in August 2012. The system consists of panels installed on ground-mounted racks, direct current to alternating current inverter, a monitoring system, and a grid-tied system.

ALBUQUERQUE AREA

- In 2011, **Zia Pueblo**, EPA, and the IHS Albuquerque Area Sanitation Facilities Construction designed and constructed a project to replace a failing community lift station. A 1.8-kW grid-tied PV system and transfer switch were incorporated into the design to generate electrical energy during the day and to provide controls over a 24-hour period. It was intended that the owner would receive a REC for the excess power generated by the lift station, as well as payment for enabling the local power utility to meet their environmental power portfolio requirements. The new lift station was completed, with the final inspection and approval conducted on June 16, 2011. Staff have been keeping records of the power meter readings, and as of August 2012, the site generates and returns a daily average of 1.5 kWh to the electrical grid in excess of what the site uses in a 24-hour period. The system itself generates more power than it uses, making this a zero-net energy building as defined in Executive Order 13514.



ENERGY BEST PRACTICES AND STRATEGIES

LIGHTING RETROFITS

- In Alaska, part of the evaluation process for energy-related projects is to forecast the effect the project will have on GHG emissions for the facility. **Alaska Native Medical Center** (ANMC) in Anchorage is planning a lighting retrofit project for high-intensity discharge lighting in the parking lot and at the Hospital entrance for FY2013. One step in the planning process will be to determine the GHG impacts, and the results of that determination will be used in project justification. ANMC staff plan to use this same evaluation tool for any future projects.

BUILDING COMMISSIONING

- The **Billings Area** has found that commissioning both new and existing buildings in the Area has a high return on investment. When a new or existing building is commissioned, it undergoes an intensive quality assurance process. Commissioning ensures that the building operates as the owner and designer intended and that building staff are prepared to operate and maintain the systems and equipment. Staff has seen reduction rates as high as 30 percent in both gas and electrical usage as a result of past commissioning projects. During this commissioning process, the Area has noted that it is extremely important that the local facilities manager be knowledgeable and dedicated to operating an efficient building since the maintenance is crucial to success.

◀ *The photovoltaic solar panel system at Zia's Pueblo lift station.*



PROGRAMMATIC AND SYSTEM OPTIMIZATION

- In the **Nashville Area**, the configuration for the boiler installed at a Youth Treatment Facility was initially programmed at 100 percent power as a default. During its operation, a 10-degree drop in boiler temperature was noticed, which was causing inefficiencies. The boiler was reprogrammed to allow for a longer cycle and thus a higher efficiency. Similarly, the Tucson Area used programmable thermostats, which allow for warmer temperatures in office spaces when they are not occupied.

EVAPORATIVE COOLING

- Another best practice in the **Tucson Area** is the increased use of evaporative cooling at the Sells Indian Hospital. Evaporative cooling cools the air through water evaporation and differs from typical air conditioning systems which use vapor-compression or absorption refrigeration cycles. As noted before, the ENERGY STAR score for **Sells Hospital** has increased from 78 to 95 in the last two years, primarily due to best practices implementation and upgraded HVAC systems. This is a significant increase and can earn the Hospital an ENERGY STAR.



▲ *Sells Indian Hospital has implemented numerous best practices in order to earn their ENERGY STAR performance score of 95.*

IMPLEMENTING A HOLISTIC STRATEGY

The Oklahoma City Area’s best practice strategies for FY2013 consist of:

- Installing advanced metering at the Claremore Indian Hospital, which will be done as a precursor to the planned re-commissioning;
- Replacing old boilers with new hydronic systems;
- Performing re-commissioning on the Clinton Indian Health Center HVAC;
- Installing automated logic controls on the building systems;
- Ensuring the Area Office has online access to automated logic at all facilities and creating reports to track and analyze energy consumption; and
- Investigating the ability of the Wewoka Indian Health Center to purchase 100 percent of their power as wind power from Oklahoma Gas and Electric Company, thus bringing the Area renewable energy consumption to 9.9 percent.

Water Conservation

In FY2012, IHS used approximately 31 gallons per gross square feet (gsf) over the entire 12 Areas, for a total of 188,800,000 gallons of water consumed by all of IHS. For an average sized hospital of about 100,000 square feet, this equates to 310,000 gallons of water per year. This FY2012 total water use intensity is over 40 percent less than the water use intensity in the baseline year of 2007; it is also more than a 35 percent reduction from the FY2011 value.

Water is a particularly important resource since many tribal areas are located in places where water shortages occur frequently. Many strategies have been used to minimize the use of water within the Areas, including xeriscaping, which is landscaping and gardening in ways that reduce or eliminate the need for supplemental water for irrigation.

The *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles)* goal of reducing potable water for new construction is incorporated into the IHS A/E Design Guide. The A/E Design Guide contains language that directs new construction projects to design indoor water systems that reduce consumption by 20 percent and to investigate options for higher levels of efficiency. To support efficient use of water outdoors, IHS is making progress to use only indigenous plants and to eliminate the use of potable water for irrigation systems and landscaping plans.

Many local initiatives to reduce water use have occurred in 2012, including those listed below:

- In Alaska, the **Alaska Native Tribal Health Consortium**, Division of Environmental Health and Engineering, is developing a plan to install water meters for federal facilities.
- The **Bemidji Area** installed water-saving fixtures. The Bemidji Area has reported a 34 percent decrease in water consumption compared to the 2007 baseline. This reduction has been attributed to the new low-flow fixtures and to not utilizing landscape irrigation.

- In Fence Lake, Wisconsin, an IHS Sanitation Facilities Construction community water system project was completed to replace the water main pipelines. In Phase 1 of the replacement, staff eliminated approximately 465 man-hours per year in labor expenses, eliminated water quality testing requirements, eliminated pumphouse heat and electrical expenses, creating realized an estimated annual savings of \$15,000, which is 7.5 percent of the facility's overall budget. In Phase 2, higher pumping rates and more efficient and less time-consuming pump operations were achieved. The project is estimated to achieve an annual savings of 8,100 kWh per year, with a cost savings of \$1,000. Total estimated annual cost savings are \$16,000.

The table below shows the water use in the baseline year of 2007, the previous year, and the current year as well as the various total costs. It also shows the percent reduction from the baseline to the current year, and the current year as compared to the previous year.

YEAR	WATER INTENSITY
FY2007 (Baseline)	54.7 gal/gsf
FY2011	49.7 gal/gsf
FY2012	31.1 gal/gsf
% change FY2007-FY2012	43.1 percent decrease
% change FY-2011-FY-2012	37.4 percent decrease



▲ Staff installing the water pipes at Fence Lake, Lac du Flambeau Indian Reservation, Wisconsin.



◀ Fence Lake, Lac du Flambeau Indian Reservation, Wisconsin staff testing new water system.



▲ A water main project in Fence Lake, Lac du Flambeau Indian Reservation, Wisconsin, helped the community save water and energy.

SPECIAL HIGHLIGHT

Partner Tribal Programs—Alaska

IHS works with tribal programs to support tribal health initiatives in American Indian and Native Alaskan communities. One such example is ANTHC, which was formed in December 1997 to manage statewide health services for Alaska Natives. All Alaska Natives, through their tribal governments and through their regional nonprofit organizations, own the Consortium. ANTHC employs approximately 2,000 people and has an operating budget of more than \$430 million.² The Consortium is based in Anchorage, Alaska, and has implemented several successful programs within Alaska.

Assisted Billing Program: ANTHC provides a billing and accounting service to 12 rural Native Alaskan utilities for a small fee. This program ensures that the monthly invoices are sent on time and are accurate each month, increases customer confidence in the accuracy of the bills, and leads to increased collection rates. ANTHC data shows that new assisted billing helped communities go from an average collection rate of 71 percent to 93 percent after three years.

Alaska Rural Utility Collaborative (ARUC): ARUC is a full management and operation service offered by ANTHC that provides water and sewer utility billing support; supervision of local water plant operators; and assistance with ordering parts, paying bills, and addressing technical issues to 26 member communities. The ARUC Advisory board works with the Councils in each individual community to set water/sewer rates annually at levels that allow each system to be operated sustainably.

Energy Program: ANTHC has completed over 40 energy audits to determine where energy savings could be realized and at what cost in community utilities. Roughly half of the energy savings identified in the energy audits recommend operational changes in water plants with very little capital investment. A statewide energy use study by the state of Alaska, titled “Alaska Energy End Use Study: 2012,” found that proper operation and maintenance of utilities in rural Alaska had more impact on energy efficiency than did engineering or construction techniques.

2012 FACT SHEET

Alaska Rural Utility Collaborative

Fuel costs average more than \$4 per gallon in urban Alaska and more than \$6 per gallon in rural communities, placing a heavy burden on Alaskans. That’s why several of Alaska’s rural communities are pooling their resources into the Alaska Utility Collaborative (ARUC).

Launched in 2008, ARUC manages, operates and maintains water and sewer systems in rural Alaska. It also provides strength in numbers with about 1,800 connections in 26 full membership communities. This means the collaborative can receive volume discounts on fuel, parts and supplies to help keep their water and sewer systems running.



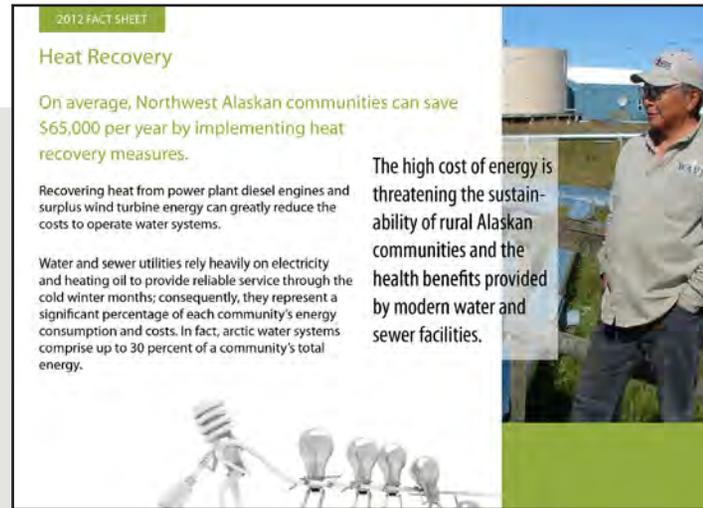
▲ Above is a brochure for ARUC, which offers water and sewer utility bill assistance.



Recovered heat is often a huge energy saver identified in the audits. Most rural Alaska communities are very isolated and often lack road systems. This means that each community has its own electrical power plant, typically with diesel-powered generators. Water systems, especially in northern Alaska, also need constant heating and circulation of the water in order to keep it liquid in temperatures that can get down to -60°F . Power plants dissipate this heat much like the radiator of a car; they use huge fans to blow the heat outside. This provides an opportunity to recover this heat and reuse it in the water plant. ANTHC pipes the recovered heat to the water plant to heat the community water system instead of using diesel boilers. This saves electricity at the power plant and saves diesel at the water plants. Recovered heat systems have been installed in a number of communities.

Renewable Energy: In Goodnews Bay, an Alaska Native community that only recently obtained a piped water/sewer system, ANTHC installed small wind turbines specifically to power the new water treatment plant. ANTHC will soon be installing large industrial-sized wind turbines for electrical power generation at another local community.

The wind turbine project in Alaska, completed by ANTHC and staff from Goodnews Bay. ►



▲ *A brochure for the heat recovery program in Alaska.*

Sustainable Buildings

IHS follows several guidance documents to develop its sustainable buildings program, including the Office of Environmental Health and Engineering (OEHE) Technical Handbook and the IHS Architectural/Engineering Design Guide (A/E Design Guide). As outlined in these guidance documents, any new IHS healthcare facilities must be designed to consume 30 percent less energy when compared with the American Society for Heating, Refrigeration, and Air Conditioning Engineers—commonly known as “ASHRAE”—energy consumption baseline. IHS is managing the construction of four such buildings, with their respective energy use below baseline: Fort Yuma Health Center (52 percent less), Kayenta Health Center (37 percent less), San Carlos Health Center (36 percent less), and Southeast Ambulatory Care Center (31 percent less).



▲ Completion of a roof insulation project at Red Lake Hospital. This project was completed as an energy conservation measure project after being recommended in the audit process.

ENERGY AND SUSTAINABILITY AUDITS

In FY2012, OEHE implemented a project to conduct comprehensive Sustainability Audits at all IHS-owned buildings. A total of 19 IHS installations received energy and water performance evaluations as part of the Sustainability Audits, or more than 650 IHS buildings, and these efforts have resulted in hundreds of recommendations for conserving resources in IHS facilities. Sustainability Audits consist of energy and water performance evaluations, GHG emissions inventories, and Guiding Principles conformance assessments. This project furthers the agency’s objectives by identifying practical cost-saving opportunities in IHS facilities, while also helping the agency comply with federal environmental regulations. The 2012 recommended projects could total more than \$2.5 million in annual savings.

The EISA 2007 requires IHS to perform comprehensive energy and water audits at all “Covered Facilities” on a cycle such that each facility is evaluated at least once every four years. EISA 2007 Covered Facilities are those that, in aggregate, consume 75 percent of the agency’s total annual energy use. In FY2012, there were 27 EISA 2007 Covered Facilities within IHS. In addition, EISA 2007 requires IHS to implement all audit-recommended measures that have a payback period of 10 years or less. One challenge for IHS is that healthcare facilities are typically more complex and more energy-intensive than operations at other agencies. Identifying energy and water conservation measures can be more difficult for healthcare facilities because of unique standards relating to medical spaces.

In addition to addressing EISA 2007 requirements, the Sustainability Audits are helping IHS meet the mandates of EO 13514, which established goals and targets for all federal agencies to make their operations more environmentally sustainable. Among various other objectives, EO 13514 requires IHS to annually quantify and report GHG emissions generated from IHS operations. Sustainability Audits calculate GHG emissions from electricity use, on-site



combustion of fossil fuels (e.g., in boilers and emergency generators), IHS-owned vehicles and grounds equipment, refrigerant leaks, and fugitive gases associated with IHS-owned landfills and wastewater treatment systems. Each IHS installation that reports annual energy use receives a GHG inventory as part of the Sustainability Audit.

EO 13514 also requires that at least 15 percent of existing IHS-owned buildings meet the Guiding Principles by FY2015, with annual progress toward 100 percent conformance by FY2030. Assessing whether an IHS building conforms to the Guiding Principles involves gathering data and evaluating the building's performance in the five Guiding Principles topic areas: integrated design, energy consumption, water conservation and protection, indoor environmental quality, and the environmental impact of materials. Sustainability Audit Guiding Principles evaluations are documented using the standardized checklist that is accessible through each building's account in ENERGY STAR Portfolio Manager.



ENERGY AND WATER EFFICIENCY IMPROVEMENTS

The most significant components of the Sustainability Audits are the energy and water performance evaluations, which are conducted at each IHS-owned Installation having a Covered Facility or at least one building larger than 50,000 gross square feet (gsf) (there are 36 sites that meet this criteria). Audits conform to the ASHRAE Level II standard. Auditors evaluate buildings in detail to define a variety of potential energy and water efficiency improvements. Each evaluation includes an examination of the entire building's energy- and water-consuming equipment; a lighting review; an inspection of building insulation and the building envelope; studies of building design and drawings; a review of past utility bills to determine whether there are billing errors and/or more appropriate billing rates; equipment scheduling analysis; a staff interview; and development of energy conservation measures (ECMs) and water conservation measures (WCMs).

During the 2012 Sustainability Audit site visits, the sustainability auditor found that many energy- and water-saving actions had already been implemented in recent years to reduce consumption in IHS facilities. These include equipment retrofit and replacement projects funded by the American Recovery and Reinvestment Act (ARRA), projects funded by the IHS ESC, as well as initiatives from IHS staff working with annual facilities appropriations to make their equipment and operations more efficient. Various projects that have been funded by ESC are listed earlier in this Report.

◀ Auditor on-site checking for thermal leaks on the roof at Crow-Northern Cheyenne Indian Hospital.

It is expected that many projects and initiatives resulting from the audits will be implemented over the next few years. Focus will be on developing projects to capture on-site renewable energy through solar panels and wind turbines, replacing inefficient lighting with energy-saving technologies such as LEDs, scheduling equipment to turn off when it will not be used, and educating staff on what they can do to reduce energy and water consumption in their day-to-day activities. IHS Area and facilities staff have found the audit process and reports to be helpful tools for developing projects and managing resource consumption in their facilities.

The Sustainability Audit project is continuing into FY2013 when auditors will complete the remaining 19 on-site audits, 103 GHG inventories, and the Guiding Principles conformance assessments for the approximately 1,600 federally-owned buildings that have yet to be evaluated. IHS staff will continue to implement the ECMs and WCMs recommended from the FY2012 audits, report annual GHG emissions to DOE, and work toward Guiding Principles conformance in IHS buildings.

The following is a summary of the recommended measures and anticipated annual energy cost savings after implementation for the 19 installations audited in FY2012.

NEW CONSTRUCTION

All new construction at IHS has specific sustainability standards that are outlined in the OEHE Technical Handbook and the A/E Design Guide. These standards cover everything from the design scope to implementation and reporting on sustainability. The construction sustainability guidelines in both documents were updated in 2010 with more stringent requirements.

SUMMARY OF FINDINGS IN 2012

Energy Conservation Measurement (ECM)	Number of Projects	Annual Anticipated Savings (\$)
Boiler Plant Improvements	8 projects	\$680,300
Other HVAC Improvements	17 projects	\$402,000
Building Automation Systems and other energy conservation measures(ECMs)	25 projects	\$331,700
Electric Motors and Drives	35 projects	\$249,010
Commissioning Measures	12 projects	\$247,700
Building Envelope Modifications	34 projects	\$186,460
Renewable Energy Systems	10 projects	\$154,500
Lighting Improvements	73 projects	\$146,840
Water and Sewer Conservation Systems	29 projects	\$49,730
Chilled Water / Hot Water / Steam Distribution Systems	13 projects	\$46,300
Appliance / Plug-load reductions	37 projects	\$19,400
Chiller Plant Improvements	3 projects	\$16,400
Other	3 projects	\$6,700
Electrical Peak Shaving / Load Shifting	2 projects	\$6,500
Energy Related Process Improvements	1 project	\$1,400
Energy / Utility Distribution Systems	1 project	\$370
Total estimated cost of measures:		\$9.6 million
Total estimated annual savings:		\$2.55 million



IHS also incorporates the principles of the Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding (MOU) and strives to meet the Guiding Principles, as outlined in the MOU. The sustainability targets presented in the A/E Design Guide are aligned as closely as possible LEED certification criteria. For instance, the design of the Kayenta Health Center replacement facility began in FY2007, and it is slated to achieve LEED Silver certification when constructed. Fort Yuma Health Center was designed to achieve LEED Gold certification. LEED targets are cited often as target design goals for IHS buildings.

Below are the several new construction and demolition projects that started or were completed in FY2012 and that followed the various standards outlined by the Guiding Principles, LEED certification process, A/E Design Guide, and OEHE Technical Handbook.

BEMIDJI AREA

- The **Cass Lake Hospital** exam room addition will be designed for 30 percent energy reduction, and is currently in the planning/design phase for LEED Silver.
- The **Red Lake Hospital** addition completed in FY2010 was designed for 30 percent reduction. Although the savings cannot be verified since it is not separately metered, the Hospital, including the FY2010 addition, had a 21 percent reduction in site-delivered Btu compared to the year prior to addition. The Red Lake Hospital addition was designed with sustainable building design principles, and an application for LEED Silver has been submitted.



▲ Red Lake Hospital completing a chiller replacement project to make their operations more efficient and sustainable.

Red Lake Hospital also put variable frequency drives on their air-handling unit to control and manage its operations. This improves the efficiency of the equipment and makes the facility more sustainable. ►



TUCSON AREA

- The Area completed the construction of two small modular buildings at **Sells** and **San Xavier** Service Units in FY2012, and they are both expected to meet the LEED federal building efficiency standards.



▲ *Modular additions that were constructed at Sells Indian Hospital.*

ALASKA AREA

The new hospital at Nome opened in 2012, and the hospital in Barrow is scheduled to open in FY2013.

As noted above, many of the IHS buildings, especially new construction, are currently aiming to achieve a LEED certification from the U.S. Green Building Council. Facility construction projects in the following locations are seeking LEED certification:

- Kayenta, Navajo Area
- Fort Yuma, Phoenix Area
- San Carlos, Phoenix Area
- Phoenix Indian Medical Center Auxiliary, Phoenix Area

RENOVATIONS TO EXISTING BUILDINGS

Sometimes it is not financially feasible to build completely new buildings. In these cases, retrofitting and upgrading existing buildings is a more practical option. This tactic can still have efficient outcomes, while working within the IHS budget. These upgrades are performed specifically to improve the operations of the current facilities to be increasingly energy and water efficient. Occasionally, particular upgrades are recommended by an audit team, but other times retrofits are initiated because a piece of equipment or part of the facility was not operating up to standards.



ABERDEEN AREA

- A chiller replacement at **Pine Ridge Indian Hospital** was performed to improve system efficiency and reduce the potential for chlorofluorocarbon (CFC) releases. CFCs are frequently found in refrigerants, and are harmful to the environment when emitted and have been found to have negative impacts on the ozone layer. The chiller replacement at the Kyle Health Center performed during 2012 will also result in higher efficiencies, including reduced energy consumption and removal of CFCs.
- Overall upgrades of the building automation system infrastructure, controllers, sensors, and front-ends at several locations in the Area are currently underway with completion planned for 2013. These upgrades include installation of water meters that will be networked similarly to the advanced power meters. This networking will allow real-time monitoring of water consumption and increase the frequency and reliability of the water consumption data that is incorporated into this reporting system.
- New server room air-conditioning systems that are more efficient and do not use CFCs will be installed at various facilities. One of these systems is designed with a free-cooling system that will not require any mechanical refrigeration processes during the winter months and will very infrequently use mechanical refrigeration during the fall and spring.
- In the **Rosebud Hospital** IT server room air conditioning project, they installed a new air conditioning system that includes a free cooling option using cooler outdoor temperatures on the condensing unit. This created a 52,754 kWh reduction, with a savings of about \$3,400 per year.
- **McLaughlin Indian Health Care Center** has a geothermal heat pump project under way, which involves replacing the existing fuel oil, propane, and electric heating systems with geothermal heating and cooling system. This will create a 186,000 kWh reduction, with a savings of about \$11,200 per year.
- The staff replaced the existing fuel oil furnaces in six quarters units in the Belcourt Service Unit with electric heat pump. There were no energy savings, but there would be a cost savings of \$4,600 per year.
- Staff at the **Pine Ridge Service Unit** installed six inches of additional insulation in 28 quarters units. This created a 650,000 kWh reduction, with a savings of about \$39,000 per year.

about \$39,000 per year savings

Six inches insulation in 28 quarters units resulted in 650,000 kWh reduction

ALASKA AREA

- During FY2012 an ARRA-funded project for the **Kanakanak Hospital** in Dillingham, Alaska, replaced an existing standby generator with a new high-efficiency generator. The project was completed in June 2012, and data is being gathered to demonstrate the actual level of fuel savings. The Kanakanak Hospital also completed a project to replace existing siding with more energy efficient siding in the administration building and to repair and re-insulate sections of the Hospital.
- **Samuel Simmonds Memorial Hospital** also completed an ARRA-funded project for new energy-efficient windows in the campus housing building.

ALBUQUERQUE AREA

- Energy-efficient products and equipment were installed in the Albuquerque Area to replace older systems during project renovations, such as heating, ventilation, and air conditioning (HVAC) units and motors.
- At the **Albuquerque Indian Dental Center**, reciprocating dental air compressors were replaced with high-efficiency, laboratory grade, dual scroll compressors with capacity reduction.

NAVAJO AREA

- The **Piñon Health Center** in the Navajo Area replaced the existing boiler with a condensing-type boiler that has an efficiency of 98 percent.

PORTLAND AREA

- In the Portland Area, the clinic at **Fort Hall Indian Hospital** was retro-commissioned, and the clinic at Yakama Service Unit was renovated, including window glazing replacement, direct digital control upgrade, and HVAC equipment replacements.



▲ The upgraded hospital at Dillingham, Alaska

SPECIAL HIGHLIGHT

Integrated Pest Management—Grassroots Efforts

In the Portland Area, Holly Thompson, an IHS Environmental Protection Specialist, has worked to create a methodology for incorporating integrated pest management (IPM) practices in more IHS Areas. She manages an Interagency Agreement between the Portland Area and the Region 10 EPA Pesticide & Toxics Unit to provide pest management outreach and technical assistance to the 43 tribes in Washington, Idaho, and Oregon. The goal of the program is to reduce the health risks and environmental impacts of pesticides through the promotion and eventual adoption of IPM. The reduction of toxic chemical use is an important aspect of sustainability, both for human contact and health reasons, but also because the possibility of chemicals reaching a water source.

IPM is a scientific approach to pest control that minimizes the human and environmental risks associated with pesticide use. It combines a number of strategies to get to the root cause of a problem, providing long-term, sustainable control. Currently, Ms. Thompson is working with IHS on including IPM as a part of the Sustainability Audit process.

Holly Thompson giving a presentation on integrated pest management. ►



▲ *Portland Area staff preparing for implementation of their integrated pest management techniques. This includes using more environmentally friendly chemicals.*



Pollution Prevention and Waste Reduction

Pollution prevention and waste reduction are among the largest challenges for IHS, since the majority of Areas are located in rural communities. Oftentimes the tribes must handle basic utility needs themselves. In some cases, the disposal center can be 50 miles or more from the reservation. This makes regular disposal and recycling difficult. However, there have been significant improvements and initiatives implemented in FY2012 to improve pollution prevention techniques.

At **Phoenix Indian Medical Center**, staff have started a recycling program that places one 8 cubic yard bin within the facility for recycling waste. The bin is collected daily, Monday through Friday, and it is full every day.

Similarly, at the **Northern Navajo Medical Center** in Shiprock, New Mexico, staff have made a concerted effort to put several recycling boxes in their office area in order to reduce the amount of waste sent to landfill, which is referred to as “diversion.”

IHS has diversion rate goals as an overall agency. With construction and demolition (C&D) projects, the DHHS has a goal for agencies to divert at least 50 percent of C&D materials and debris from the landfill, either by reduction or recycling, by 2015.

At the **Chinle Service Unit**, staff worked with Navajo Sanitation for the past two years to develop a residential curbside recycling program. The contract is currently pending award. This program is modeled after common city recycling systems, with two pickups per week—one for regular garbage and a second for recyclable products.



SPECIAL HIGHLIGHT

Casino Recycling Program—Grassroots Efforts

Theresa Villebrun, Procurement Director at Prairie's Edge Casino in the Upper Sioux Community in Granite Falls, Minnesota, saw a webinar on recycling in 2010 and was inspired to start her own program, which officially started in 2011. She began the development process by first getting approval from general manager and upper management. Her next task was to start a green team. This team consists of eight staff members from various departments at the Casino. Having a green team with wide buy-in ensured that every aspect of the Casino's operations would be involved and informed at all times—including upper management, whose buy-in helps considerably with any financial or operational decisions.

The green team began considering local disposal facilities, and they took field trips to the potential locations where they could recycle. The green team ultimately decided on the vendor because it cost nothing for the recycling to be picked up, and the company provided all the containers. Since the start of the program, the green team has reassessed the demands and requested that more containers be brought in. Each year sees an increased diversion rate.

To keep the Casino informed, green team members make announcements to their respective departments. The team also posts fliers and signage in the lunchrooms, bathrooms, and other public areas, and provides brochures and signs to let visitors know about the recycling program. Information about the recycling program is now included in the orientation for new employees.

Theresa, as the Procurement Director, also ensures that the Casino is purchasing green products (e.g., cleaning chemicals and bath tissue). This supports the recycling program, as whatever is purchased at the Casino ultimately goes into the waste stream. The program has also expanded to other aspects of sustainability; for example, the Casino removed paper towels from the bathrooms and replaced them with air dryers. This minimizes waste and is considered more sanitary.



▲ Theresa Villebrun and a staff member recycling bottles into the specially designated receptacles at Prairie Edge Casino.

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