


# *Sustainability Report*



**Great Western Malting Co.**



**Our Mission:** We operate to benefit our shareholders, customers and our company. Our team will conduct business ethically and responsibly as we strive to have our process, product and service recognized as the best.

# *Sustainability*

**Sustainability translates into all of us efficiently using our resources in ethical and responsible manner day in and day out. This is not an add-in, but an integral part of our daily Mission-Values-Policies-Actions; below are several key examples of our focus:**

## ***Our Mission:***

We operate to benefit our shareholders, customers and our company. Our team will conduct business ethically and responsibly as we strive to have our process, product and service recognized as the best.

## ***Our Values:***

- **Integrity:** We want to be a company that can be trusted.
- **Ownership:** Our team has a passion and pride for our business.
- **Accountability:** We hold ourselves accountable for our successes and our mistakes.
- **Customer Focus:** The value we deliver in our products and services defines our point of difference.
- **Objectivity:** We strive to achieve operational excellence thru objective measurement of everything we do.
- **Teamwork:** We work together as a team to quickly overcome problems and exploit opportunities

## ***Environmental Policy:***

Great Western Malting Co. is committed to protect the environment through a policy of continual improvement and sustainable development. Sound environmental stewardship and the reduction of pollution are in the best long-term interest of our shareholders, customers, employees and the communities that we operate within. To fulfill these commitments we shall strive to:

- Communicate this environmental policy to all employees and onsite contractors and to make this policy available to the public upon request.
- Ensure our facilities, operations and activities meet or exceed all applicable environmental laws, regulations and our internal Environmental Management System policies and procedures.
- Document and report environmental non-conformance and/or non-compliance both internally and when appropriate to governmental agencies. The company will act promptly to remedy any environmental non-compliance.
- Review and consider the environmental effects of strategic plans, acquisitions/consolidations and facility construction/remodeling.
- Set clear environmental objectives and provide adequate resources to achieve them.
- Measure both corporate and employee performance in meeting environmental objectives, laws and regulations through a process of management review and periodic external review.
- Have each site manager report monthly to their functional Director on the environmental performance on their site. Each Director in turn shall report the environmental performance of their operations/sites to the upper management group on at least a quarterly basis.

# ***Management Systems:***

Great Western's cornerstone of our energy and carbon focus is our management systems. Plant management is given defined production targets including environmental targets such as energy, water, wastewater and yield. Plant management on an hourly/daily basis uses real time monitoring by using our process control systems through our Man-Machine-Interface (MMI) to ensure targets are achieved. On a weekly basis this data is summarized and reviewed both at the plant level and in the boardroom by top management and variances to targets are explored, defined and corrected.

**\* *All Sites & Corporate Offices:*** Weekly plant and top management environmental/production targets review of critical data at all sites. Data is compared to weekly budget, weekly forecast, and week to prior year's week. If targets are not achieved, immediate corrective actions are implemented. Successes and failures are shared at multiple weekly focus meetings both at the plant and corporate management levels. Areas monitored include:

- *Natural gas per MT of production.*
- *Electricity per MT of production.*
- *Carbon Footprint per MT of production.*
- *Water volumes per MT of production.*
- *Wastewater volumes per MT of production.*
- *Production yields.*
- *Moistures levels.*
- *Major breakdowns and preventive maintenance completed.*
- *Safety & environmental non-conformances.*

**\* *All Sites & Corporate Offices:*** Corporate and personal sustainability MBO's set as part of the annual performance management plan.

**\* *All Sites & Corporate Offices:*** Plant & top management's compensation is based in part on successful management of the key MBO's numbers. Failure to achieve targets will result in reduced compensation.

# Geothermal Heat:

Great Western has been a pioneer in using geothermal heat to offset natural gas purchases. We have been using geothermal heat since the late 1930's in our Vancouver Washington plant to heat and cool all of our incoming germination air. In addition we have conducted joint studies with the US Department of Energy at our Pocatello Idaho plant and today heat our steep water using geothermal energy.

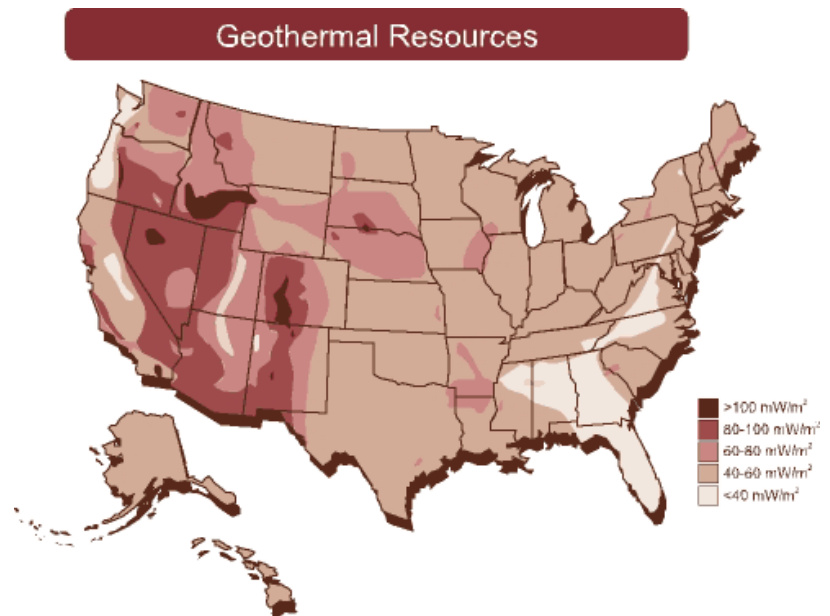
✳ **Vancouver WA:** The plant's production buildings are heated and cooled using geo-thermal energy extracted from groundwater.

✳ **Pocatello ID:** Conducted studies with the US Department of Energy reviewing additional use of geo-thermal energy at the plant.

✳ **Pocatello ID:** Used the US Department of Energy report to design a system to have the Steep water temperature controlled using FactoryLink MMI to blend different temperatures of geo-thermal of water to the production target while saving on

natural gas and electrical power. We use of these geo-thermal wells to supply hot & cold ground water wells to save gas on boilers for heating & power for traditional refrigerated chillers gave the site a combined site gas savings = 7,000 BTU/yr and 33,455 kwh/yr for electricity annually. This also reduces our annual carbon foot print by 6,283 Metric Tonnes.

✳ **Pocatello ID:** Use of geothermal heated air from the spray decks to heat a portion of the steep room air saving on natural gas to heat the room and steep tanks.



## ***Biogenic Heat Recovery:***

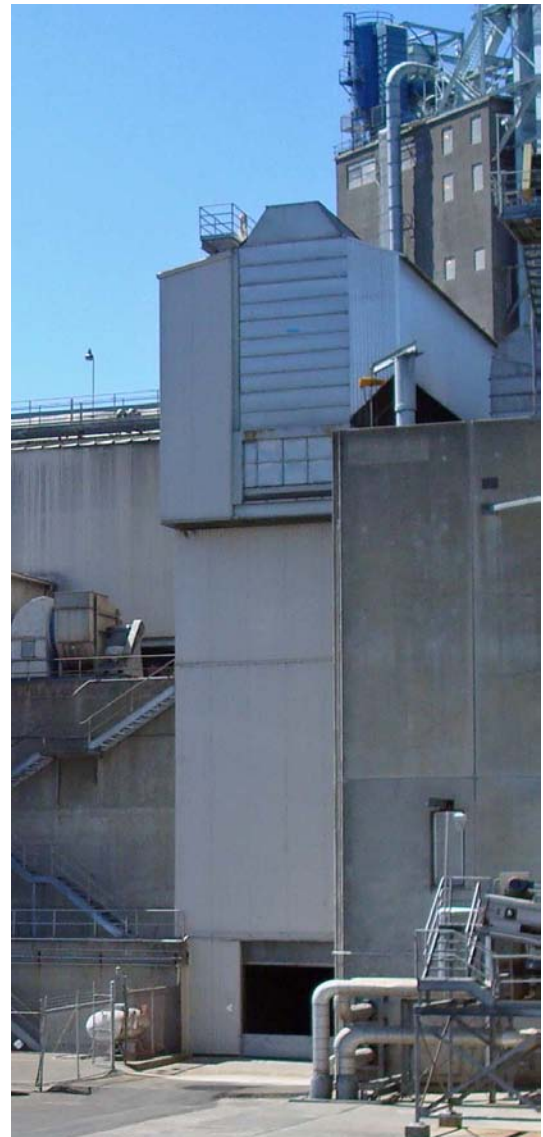
Biogenic is a substance produced by life processes. During our malting process germinating grain is undergoing active respiration. During respiration, the growing grain generates a large amount of heat (105<sup>oF</sup>) as a by-product of the respiration. We use this biogenic generated energy to heat our malt houses in both Pocatello ID and Vancouver WA. In marine NW climate such as Vancouver Washington, this biogenetic heat and our geothermal heat are the only heat source for the malt houses.

- \* All Sites: Germination grain generates heat during respiration. We use a portion of this waste heat to heat the incoming germination airflow and reduce natural gas used to heat the germination air.*

## ***Kiln Heat Recovery:***

All of our malt houses uses exhaust heat recovery to recover waste heat exiting from the malting kiln. These large roof mounted heat recovery units pre-warms the outside air coming into the malt kilns. We have also directed our waste heat from other equipment such as air compressors in both the malt house and the kiln into these heat recovery units.

- \* All Sites: Recover waste heat from the kilning and other equipment such as air compressors and refrigeration equipment back into the kiln's air flows to reduce he natural gas used to dry the malt.*



# Synergy Partnerships:

Synergy (from the Greek syn-ergo, συνεργός meaning working together) is the term used to describe a situation where the final outcome of a system is greater than the sum of its parts. At Great Western synergy projects are a major focus. We currently have several projects under development and one project announced:

✱ **Pocatello ID:** *The first of these projects will be coming on line in 2010 at our Pocatello plant. Great Western, the City of Pocatello and Hoku Scientific have come together to form a true win/win solution. Hoku is building a polysilicon plant that will supply a large amount of polysilicon for the fast growing solar panel industry. A byproduct of the polysilicon process is waste heat that the other polysilicon plants have to build and operate large cooling fans/towers to keep the cooling water temperature within their required operating targets. Our Pocatello plant's malt kiln will serve as the heat sink for the Hoku cooling water flow. We are projecting in 2010 we will be seeing a 16,000,000 k or greater reduction in our annual CO<sub>2</sub><sup>e</sup> footprint.*

✱ **All Sites:** *We have conducted several studies and have concluded pilot plant water reclaim study. We are currently working with several engineering companies on the final engineering plans for a full scale water reclaim plant to reuse our process water for non-process uses both within our plants and to supply industrial reclaim water to nearby industries. This is a critical project to ensure adequate water for future generations.*



REUTERS



Looking ahead  
Reuters Global  
Environment Summit  
What The Experts Have  
To Say

## REUTERS DEALS

THE GLOBAL DESTINATION FOR  
DEAL-MAKERS AND INNOVATORS

### Hoku and Great Western Malting Announce Collaboration on Utilities, Access

Fri Jun 20, 2008 8:00am EDT

POCATELLO, ID, Jun 20 (MARKET WIRE) -- Hoku Materials, Inc., a wholly owned subsidiary of Hoku Scientific, Inc. (NASDAQ: HOKU), established to manufacture and sell polysilicon for the solar market, and Great Western Malting Company, a subsidiary of United Malt Holdings and a supplier of high quality specialty malts to brewers throughout the United States and the world, announced today that they have entered into a collaborative agreement regarding the use and distribution of waste heat in the form of process water from Hoku's planned polysilicon manufacturing plant. Great Western owns and operates a malting facility on the parcel adjacent to the land leased by Hoku from the City of Pocatello.

According to the agreement, Hoku will supply Great Western with heated process water, a byproduct of polysilicon manufacturing. Great Western will use the water as an indirect heat source in its malt production line and then return the cooled water to Hoku for re-use. This closed-loop arrangement will reduce natural gas requirements and resulting emissions and carbon footprint for Great Western, while providing Hoku with a simple, lower-cost option to cool and recycle its process water.

## ***Carbon (CO<sub>2</sub><sup>e</sup>) Reduction:***

At Great Western we understand the purchase and use of energy, even the location of our plant can have an impact on our output of CO<sub>2</sub><sup>e</sup> emissions. We actively manage our purchases of all our energy and work with local energy providers.

- \* All Sites: We are conducting a formal Scope 1 and Scope 2 CO<sub>2</sub><sup>e</sup> inventory looking at our emissions of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, CFC's, PFC's & SF<sub>6</sub>. At our Great Western sites. This inventory will be completed in early December 2008. We using the Climate Registry protocol for our inventory and plan on formal registration with the Climate Registry in early 2009.***
- \* Out Scope 1 and Scope 2 carbon footprint is has reduced 9.5% over the last 10 years. Our current carbon foot print is 223kg CO<sub>2</sub>/MT Malt produced. We are projecting by 2010 our footprint will be 177kg CO<sub>2</sub>/MT which is a 24% reduction. (Early projections)***
- \* Vancouver WA: Working with local energy provider to supply a carbon neutral power mix. Currently 75% of power supplied is carbon neutral with an average of 232 lbs of CO<sub>2</sub> per MWh.***
- \* Working with the City of Pocatello of the potential development of city/industry owned windmill project to power our plant.***
- \* All Sites: Currently reviewing carbon neutral power supply options at our North American locations.***
- \* All Sites: Extensive use of FactoryLink MMI to control critical energy, water and other critical input to ensure resource use targets are met on daily basis while meeting our customer's specifications. This saves 39,000 MWh of power and 23,926,000 kg of CO<sub>2</sub> per year.***
- \* All Sites: Monitor carbon footprint per metric ton of production on a weekly basis.***

### **CO<sub>2</sub><sup>e</sup>: Carbon dioxide equivalent**

Carbon dioxide equivalency is a quantity that describes, for a given mixture and amount of greenhouse gas, the amount of CO<sub>2</sub> that would have the same global warming potential (GWP), when measured over a specified timescale (generally, 100 years). Carbon dioxide equivalency thus reflects the time-integrated radiative forcing, rather than the instantaneous value described by CO<sub>2</sub>e.

- \* **All Plants: Factory Link MMI Automated process controls implementation has improved efficiency by assuring equipment runs when needed and alarms of faults. One case allowed for sharper pump runtime Management. Pumps ran only when needed automatically instead of deadheading much of the time previously. 268,800 Kwh saved and 164,908 kg of CO2 per year.**
- \* **Vancouver: process control improvements were combined with new grain dust air pollution control equipment to improve air quality at significant power consumption savings. Using smaller more efficient systems that run only as needed & self clean automatically to keep air pollution control performance consistently high has allowed a 322 Hp savings = 33,300 Kwh and 20,245 kg of CO2 per year.**
- \* **Pocatello: Replace large air compressor was replaced with variable speed 60 hp units to better track load & shutdown completely when not needed. Additionally, waste heat from the new Compressors was recovered and used to heat the building. Power & gas savings = 3,176 Kwh and 1,948 kg of CO2 per year.**
- \* **All plants: Have equipped large drying kiln fans with Variable speed Drives on every fan at every plant. In Pocatello for instance, we have six 200 hp Kiln fans. A savings by slowing the fan down to provide just enough air movement as needed has saved power & natural gas = 1,460 Kwh and 895 kg of CO2 per year.**
- \* **All plants: Replacement air compressors with water ring blowers to improve steep aeration while reducing the electrical energy demands.**
- \* **Pocatello: Use of kiln moisture and temperature probes to achieve target grain temperatures while using less gas and electricity.**

# ***Recycling & Waste Reduction:***

Great Western is process base industry, small changes in inputs and waste reduction can have far reaching effects on our company, employees, customers and our community.

- \* All Plants: 95% of our products are shipped in reusable shipping units.***
- \* All Plants: Bagged customers have the option of requesting a 100% recyclable bag.***
- \* All Plants: Installed new grain cleaning equipment and pelletizers that divert 180,000,000 lbs/Year of waste grain by-products from the landfill and the sewer treatment plants into an animal feed supplement.***
- \* All Plants: Weekly review plant and top management review of process inputs.***
- \* All Plants: The use of higher yielding barley varieties that allow both our malt houses and our customers brew house to achieve higher process yields that allow both maximizing their inputs efficiencies and reducing required energy use.***
- \* Vancouver WA. & Pocatello ID: New barley cleaning lines have been installed that reduce barley breakage and increase production yields.***
- \* All Plants: Implemented a program to increase the amount of local regional contracted barley for our plants. This both ensures and high quality barley and reduced transportation costs and carbon footprint.***



# ***Packaging, Distribution & Transportation:***

Packaging and movement of our raw materials effect our operations at Great Western. We designed our systems to minimize the distances ingredients are shipped to the malting faculties

- ✱ ***All Plants: Plants were placed in locations to maximize the use of existing grain transportation routes for both inbound grain shipments and outgoing malt and animal feed by-product shipments utilizing fuel efficient rail transportation routes***
- ✱ ***All Plants: Development of regional barley growing programs has lead to the successful development of growing areas such as the Snake River Basin.***
- ✱ ***Vancouver WA: Use of Hi-Cube rail cars to ship malt to reduce the energy per unit of product shipped.***
- ✱ ***Vancouver WA: Development and execution of direct loading bulk malt on ocean going ships.***
- ✱ ***All Plants: Grain transportation is key aspect of our profitability that is monitored daily.***
- ✱ ***All Plants: Developed and implemented plant procedures to ensure railcars are loaded with the maximum volume of malt to reduce the energy per unit of product shipped.***



# Water:

Water is the lifeblood of the malting industry. Climate change, crop changes and population growth are all challenging water supplies through the West. Barley is great dry land crop for the growers. Currently 15% to 20% come from irrigated sources. We at Great Western have been driving changes throughout our system such as:

- ✱ **All Plants: Water use per metric ton of malt produced is process measurement that is review daily at the plant level and weekly at the corporate level.**

- ✱ **Calgary: We have partnered with the Province of Alberta to conduct a research and pilot study to reclaim malting wastewater for reuse and sale to other industrial customers. In 2007 we ran a pilot Membrane biological reactor (MBR) pilot plant that demonstrated the cost effectiveness of the MBR system. We are currently working with Alberta Environment and MBR equipment providers concerning permitting and policy issues related to the project.**



- ✱ **All Plants: The Calgary study has demonstrated the high quality reclaimed water can be produced for reuse in the plants. Using the water for boiler feed and wash water will reduce a plant's water use by 5%. Larger water reductions (35% to 40%) could be made if customers allow reclaimed water use during the 1st fill of the steeping process.**

- ✱ **All Plants: Targeting malt quality to meet each customer product specification. Annual savings 1,310,029,207 gallons of water, 1,048,023,366 gallons of wastewater, 5,223,033 MWh of power and 4,450 MT of CO2 emissions per year**

- ✱ *Pocatello ID: Lowering of the steep tank overflows to allow full and robust steeping and overflows while reducing the amount of water required. This saves the site 7,000,000 gallons, 27,778 KWh of power and 23,778 kg of CO2 emissions per year.*
  - ✱ *Pocatello: Install variable frequency controls (VFD) on ground water wells to control the water volume and reduce energy use.*
  - ✱ *Pocatello: Air Humidification systems were redesigned to use less Water, less power & smaller pumps while boosting humidification levels from the low 90% to 98%. Water saving resulted along with effluent reductions*
- 

## ***Our Mission:***

We operate to benefit our shareholders, customers and our company. Our team will conduct business ethically and responsibly as we strive to have our process, product and service recognized as the best.