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MINING REVIEW

ENERGY

MINNESOTA POWER

ON ENVIRONMENTAL POLICY CHANGES



COAL SUPPLEMENTATION

with Alternative Fuels

US STEEL COMPLETES

\$60 Million Concentrator Upgrade

INTERNATIONAL STEEL GROUP INC.

Begins Cleveland Hot Strip Mill Production

US DISTRICT COURT JUDGE

Rules Against Appalachian Mountaintop Mining

NORANDA TO TEMPORARILY IDLE

QC Zinc Mine

Editor's Corner

This is our energy issue for the year. Now in this time of war on terrorism and the threat of global warming, it is a burning issue indeed (pun intended). Looking ahead, how are we going to be able to find the vast quantities of energy (clean, dependable and at a reasonable cost) that we are going to need to get us through the 21st century? Any thinking person must now be fretting about the nation's dependency on foreign oil, specifically Middle East oil. We don't like that. We know this dependency makes us too vulnerable, and we continue to cast about for alternative energy sources. Our journals are filled with references to biomass, wind and nuclear power generation, natural gas, hydrogen cells and, of course, the burning of coal. Aye, there's the rub. Any serious dis-

ussion of energy sooner or later gets around to acknowledging that – dang it all – we are going to have to rely on the use of coal for a good long time, even as we develop alternatives. It is the one fuel that we've got plenty of. To quote ourselves from a previous issue, *Ole King Coal* (March 17, 2001 Vol. 90, No. 11) is likely to be the fuel that powers our industrial economy for the foreseeable future, whether we like it or not.

The question is not if we will depend on coal; it is whether we will have perfected the means of using it responsibly so that people here in Minnesota and elsewhere can go back to eating fish regularly from local lakes.

Michael Cashin of Minnesota Power makes fleeting reference to something called "Pahlmanite," a black powdery substance developed by a Minnesota

company called EnviroScrub. In field tests at Minnesota Power's Boswell Energy Center in Cohasset, MN, the technology was able to scrub 99% of SO₂ and 96% of Nox from the plant's exhaust stream and showed potential also for capturing mercury. It is a very promising technology.

US Steel's Minntac plant at Mt. Iron, MN, and a number of other area mines, routinely use large quantities of biomass (actually wood wastes from the area's forest products industry) as a supplement to natural gas and electric power generated heat.

Every mining operation in Minnesota and Michigan continually seeks ways to reduce its electric bill, which averages somewhere close to 30% of all costs. And they are all finding ways.

Read on.

MINNESOTA POWER

Serving Customer Energy Needs in a Period of Environmental Policy Transition

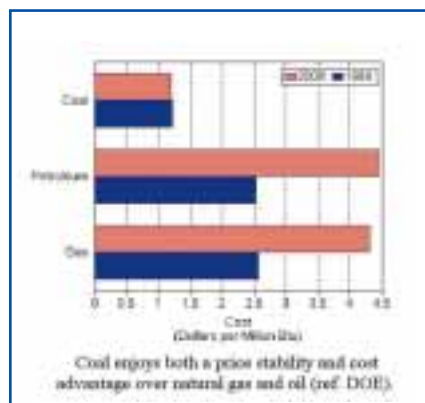
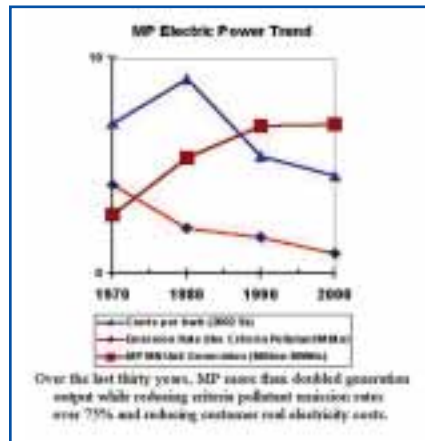
Michael G. Cashin, P.E., corporate environmental engineer, Minnesota Power

The energy industry is facing an array of challenges as national environmental policy is in transition towards market based environmental compliance, rooted on achievement of aggressive environmental quality goals. The Clean Air Act (CAA) requires that National Ambient Air Quality Standards (NAAQS) be established by the US Environmental Protection Agency (EPA) to be protective of human health and welfare with a margin of safety. In turn, the CAA requires that affected sources operating permits include restrictions that provide for emission controls needed to attain the standards.



Michael Cashin

Significant progress towards attainment of the standards has been achieved over the three decades since promulgation of the 1970 CAA. However, the Clean Air Act was amended in 1977 and again in 1990 and is currently due for reauthorization. It also requires emission reductions to meet special program require-



ments, such as the regional haze, acid rain and hazardous air pollutant programs. Also, new power plants are required to meet New Source Performance Standards (NSPS), so that new installations provide for the latest innovations in commercially available control technology, regardless of air quality attainment status. The EPA establishes standards for Best Available Control Technology (BACT) or Lowest Achievable Emission Rate (LAER) technology that satisfy NSPS requirements, with updates about every 5 years. The CAA also requires that existing units undergo review as a new source (New Source Review) if the unit is repowered or undergoes a major modification that results in significantly increased emissions. This overlay of the various CAA requirements with independent targets and timetables results in uncertainty for utility planners and unnecessarily high emission control costs. Utilities are confronted with the prospect that controls installed to comply with one program will be deemed deficient when requirements for a new program are established.

Recent multi-emission approach proposals seek to remedy this problem. CAA programs that create conflicts when applied piece-meal are proposed for replacement with a comprehensive approach that involves phasing-in national emission restrictions capped at levels achieving or outperforming the air quality progress targeted by the various CAA programs. Allowing trading of emissions credits within the targeted emission caps reduces overall compliance cost.

Minnesota has already established itself as an air quality attainment state. In fact, the May 2002 American Lung Association, State of the Air report lists the Duluth-Superior and Fargo-Moorhead metropolitan areas as being among the best ten air quality regions in the nation, as measured by regional ozone (smog) monitors. However, regional air quality continues to be a concern in some high population areas, primarily in eastern and coastal states. EPA recently released its projection of counties that will likely not be in attainment with the new ozone and fine particulate standards, depicting those areas in which further emission reduction action is needed.

Motor vehicles, electric-generating units, industrial process emissions and residential activities are among the primary sources of man's air emissions. These emissions, combined with natural emissions (forest fires, wind erosion, molds, pollens, terpenes etc.), can contribute to local or regional air quality

problems. In the electric utility sector, the focus has been on improving generation efficiency, introducing more renewable energy, encouraging customer conservation and reducing stack emissions of oxides of sulfur (SO₂), NO_x and mercury. All energy sectors that combust fossil fuels are challenged by emerging concerns associated with the production of the naturally occurring greenhouse gas, carbon dioxide.

Minnesota Power (MP) has an exemplary record of environmental performance while delivering low cost, reliable electricity to serve our customer needs. MP also has a history of being a regional leader in initiating proactive measures for addressing environmental concerns. Over the last thirty years, MP has more than doubled its Minnesota fossil fuel based generation. This was accomplished while reducing our emission rate of criteria pollutants by over 75% and reducing the real cost of electricity we supply to our customers. This sort of financial and environmental performance has been reinforced by an incentive-based merit system that rewards all MP employees when financial, safety and environmental goals are achieved. MP emissions performance surpasses the air quality standards as MP retains a large margin of compliance with permit limitations established to support local air quality standard attainment.

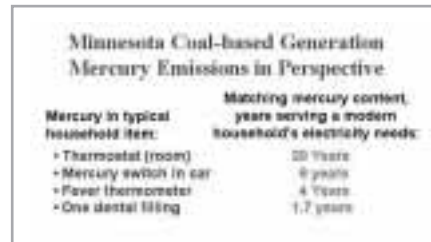
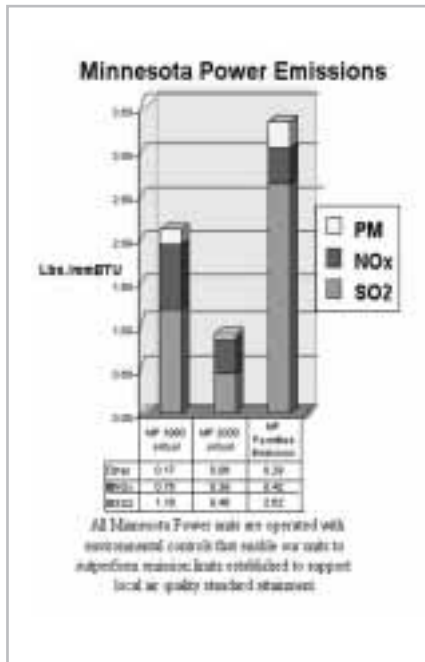
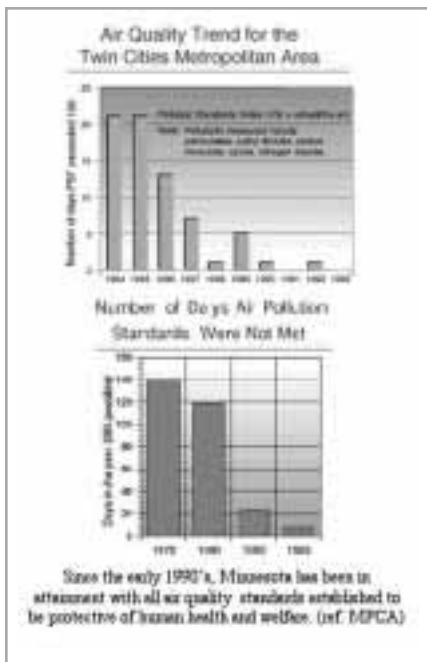
Minnesota Power electricity production serves the unique energy needs of our regional taconite and wood products


industry that, along with tourism, provide the foundation for the northern Minnesota's economy. Energy consumption can amount to as much as 30% of the production cost for some of our industrial customers. Clearly, the cost for emission control retrofits or repowering is not trivial and is of special concern to industrial customers depending on a secure supply of low-cost energy to compete internationally. It is also important for our energy policy interests that the US retain a diverse energy mix, optimizing the use of domestic energy resources that supports our domestic industrial base.

Costly new emission control or energy supply requirements must be supported by justifying environmental health and welfare benefits, rooted on sound science findings from responsible, expert and unbiased organizations that implement standard peer review practices, such as the National Academy of Sciences. Conversely, unnecessary environmental control costs need to be carefully weighed. If US industry is forced out of business, production and jobs may shift overseas where wages are lower and environmental restrictions, often, more liberal. There is good justification from the standpoint of environmental health and welfare to "right size" control requirements.

Energy sourcing in the US varies significantly from region to region, reflecting availability or cost effective access to energy resources. It is the combustion of fossil fuels (primarily coal) that is

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associated with most of the environmental emissions of concern. Thus, most of the control cost exposure to emerging new environmental requirements is in the central states in close proximity to domestic coal reserves.

Just as there are significant regional differences in the sourcing of fuels, there are significant regional differences in the type of coal burned and in access to natural gas supplies. MP burns low sulfur, low mercury-content western subbituminous coal that is economically available by train from Montana and Wyoming. MP achieves SO₂ emission rates from coal combustion that run about half the national average.

Natural gas is often suggested as an alternative to coal and is projected by the Department of Energy in their Annual Energy Outlook to serve the majority of new electricity demand in the United States. Natural gas contains negligible sulfur and mercury and technology is commercially available that enables higher efficiencies, lower NO_x emissions and about half the carbon dioxide emissions compared to coal. However, expanded natural gas supply depends heavily on imports, and natural gas pricing typically is more than double the price of coal and is also more price volatile. Coal is a more economic and reliable domestic supply resource. When natural gas and oil prices spiked in 2000, coal prices for equivalent energy content remained stable.

Minnesota Power Response to the Environmental Transition Challenge

Existing resources at MP are being optimized to serve customer needs in a cost-effective and environmentally responsible manner. New resources are under development so that Minnesota Power can serve customer needs well into the future.

- MP's Boswell Energy Center, Laskin Energy Center and Taconite Harbor Energy Center serve the Iron Range with reliable, locally generated electricity. All MP facilities are operated in an environmentally responsible manner, with emission control equipment needed to support compliance with standards established to be protective of human health and welfare. Controls in service include particulate and sulfur dioxide scrubbers, electrostatic precipitators, fabric filters and low NO_x burners. Process water is also treated before discharge and coal combustion ash is stored in lined ponds or landfills.

- Combined heat and power (CHP) energy supply meets customer process energy needs while producing electricity, significantly improving overall process energy efficiency. Biomass fuel created as a waste from the forest products industry is sourced locally and is a good “open loop” biomass, renewable energy resource.

- The M. L. Hibbard, Duluth Steam District # 2 is a hybrid CHP operation serving the Stora Enso paper mill in Duluth, MN. Overall, about 90% of heat input is from

renewable wood waste, with the balance from coal or natural gas.

- MP recently installed a topping turbine at the Sappi (formerly Potlatch) facility in Cloquet, MN. High efficiency, CHP electricity sourced about 50/50 from wood/process waste and natural gas supplies regional electricity market needs.

- MP has proposed installation of a CHP facility at the Grand Rapids, MN paper mill in partnership with the mill owner, UPM Kymmene. This facility would replace old boilers, boosting generation output while outperforming new source performance standards. The facility will combust up to 40% renewable wood waste with low sulfur coal in a fluidized bed boiler, efficiently delivering steam for mill use while producing electricity.

- Under our Wind Sense program, Minnesota Power is offering renewable wind energy from the Buffalo Ridge area in southwest Minnesota to customers who volunteer to buy blocks of wind energy reflecting the cost premium associated with this intermittent energy resource.

- We operate about 118 megawatts of Minnesota hydroelectric generation, serving about 8% of our customer energy needs from this local, renewable energy resource.

- We are assisting Enviroscrub in their development of a proprietary process using “Pahlmanite”. This promising technology, targeting the economic removal of SO₂, NO_x and mercury from coal combustion flue gas, is currently being assessed at the Minnesota Power Boswell Energy Center for potential commercialization.

- Minnesota Power is developing highly efficient natural gas generation in our region, including the recently announced Superior Generation facility in Superior, WI.

- We are a charter Climate Challenge program participant. This voluntary program has reduced or offset about 5% of annual Minnesota Power carbon dioxide emissions. There is no commercially available technology for removal and long term storage of carbon dioxide produced from fossil fuels. Minnesota Power encourages the application of voluntary measures to address greenhouse gas emission concerns while expanded research establishes the

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AK Steel/ Nippon Steel Expand R&D Alliance

AK Steel, Middletown, OH has expanded its alliance with Nippon Steel Corp., Tokyo, regarding cold-rolled, non-oriented and grain oriented electrical sheet steel products. AK said the expanded alliance results from a common

goal between the companies to serve existing global markets, particularly to meet the increased demand for highly efficient steels for electrical generation, transformers and distribution equipment.

AK Steel, and its predecessor company and Nippon Steel have shared licensing and technical information exchanges for more than 50 years, more recently in the form of R&D information exchanges.

The expanded agreement with Nippon will allow both companies to expand the scope of technical exchanges through sharing of corporate resources and research capabilities, AK said. **SMR**

Northshore Mining Increases Production

Rehires Laid-Off Workers

More indications that the domestic iron ore market is picking up: Northshore Mining Co., Silver Bay, MN, announced on Friday, May 3 that it is increasing pellet production to full capacity and is recalling all employees who have been laid off since the fourth quarter of 2001, and will be making a small number of new hires.

Robert C. Berglund, general manager,

said, "This is a clear indication that steel operating rates are improving and pellet demand is increasing."

The company, which had said previously that it expected to produce between 3.5 and 4 million tons in 2000, now says it expects to produce a total of about 4 million tons in 2000, working at the full capacity rate. Full capacity for a full year of operation is 4.3 million tons.

The added production will require restarting equipment that has been idle since early 2001, the company said.

Northshore Mining Co., which operates a mine near Babbitt, MN, and a processing plant and a Lake Superior loading dock at Silver Bay, MN, employs about 500 people. The company is owned and managed by Cleveland-Cliffs Inc, Cleveland, OH. **SMR**

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means for cost effective action.

• We have actively participated in the voluntary Minnesota Mercury Reduction Initiative. This program is meeting its goal to reduce man's mercury emissions in Minnesota 70% by 2005. We have voluntarily reduced mercury emissions associated with our Minnesota electric generation by about 20%, primarily by using more lower mercury content coal. Trace amounts of mercury released when coal is combusted are expensive to remove (USEPA and DOE estimates range over \$2000 per ounce removed) at high percent removal rates and awaiting cost-effective commercial technology development. The Minnesota voluntary program

has demonstrated that it can be more cost effective to recover mercury contained in familiar household items.

• Minnesota Power is funding scientific research to help develop a sound science foundation for emerging environmental concerns, including research to help determine economic mercury removal technologies.

While the next two decades are expected to present new environmental performance challenges to electric utilities, Minnesota Power is preparing to meet those challenges while continuing to meet our customer expectations for reliable and affordable electricity, delivered in an environmentally responsible manner.

For more information, contact Michael Cashin at mcashin@mnpower.com. **SMR**