NIA | National Insulation Association®

THE POWER OF INSULATION

A Proven Energy-Saving Solution

- Saves Enormous Amounts of Energy
- Typical ROI: 6 Months – 2 Years
- Creates and Preserves Jobs
- Delivers Major Savings for the Life of a Facility

Why Insulate?

Now more than ever, insulation should be an integral part of your company's energy efficiency, productivity, cost reduction, and personnel protection plans. Here's why.

Insulation Saves Energy

The most widely accepted benefits of insulation are energy savings and the resulting cost savings. Energy is often the most costly component in managing a building or manufacturing facility and its processes. Reducing energy consumption reduces costs, and lowering costs is a primary objective for most companies. Insulation is also an exceptionally cost-effective investment: properly designing, installing, and maintaining an insulation system can yield an annual rate of return that is more than 100 percent.

In addition, insulation greatly reduces loss of energy. Equipment or processes that lose energy can increase the temperature within a facility or area and put additional stress on other equipment, reducing its performance and life expectancy.

Saving energy with mechanical insulation is a quick and simple way to save money, whether for hot or cold applications. As one facility manager notes, of all the energy-saving technologies available, a properly insulated system can provide the best ROI. It makes good business sense to look at insulation first.

NIA estimates maintenance of mechanical insulation in industrial/manufacturing plants could save annually $3.7 billion in energy costs and 37.9 million metric tons of carbon emissions, with an ROI of 11.3 months.

Insulation Reduces Emissions

A reduction in energy consumption means less fossil fuel is burned to produce energy. The result is a reduction in the amount of greenhouse gases emitted into the atmosphere. These gases have been directly linked to global warming and pollution. Reducing energy and emissions is a great win-win scenario.

Insulation Offers Amazing Returns and Reduced Life-Cycle Cost

Insulation can provide unrivaled ROI and improve life-cycle cost. Quantifying the rate of return is easy; software and energy assessment procedures are proven and readily available, as are certified insulation energy appraisers. It has been estimated that a building's initial construction cost represents only 20 to 30 percent of the building's entire cost over its 30- to 40-year life. For the schools in a recent study, it is estimated that mechanical insulation saves on average 20 percent of the total usage. Consider the life-cycle cost of the total project rather than just the initial capital cost.

For hospitals, energy savings from mechanical insulation average 78% of the total site energy usage.

"[In one plant] Dow saves $800,000 per year through steam systems insulation improvements."

–Frederick "Fred" P. Fendt, P.E., Energy Efficiency and Conservation Team Leader, Dow Advanced Materials, The Dow Chemical Company

Insulation Is Critical to Sustainable Design

What is sustainability? According to the National Institute of Building Sciences' Whole Building Design Guide, sustainability or "sustainable design" supports an increased commitment to environmental stewardship and conservation, and results in an optimal balance of cost, environmental, societal, and human benefits while meeting the mission and function of the intended facility or infrastructure. Sustainability should provide a bottom line supporting: (1) economic growth, (2) environmental stewardship, and (3) social progress.

Mechanical insulation is a sustainable design technology whether used with equipment or on its own. Whether you are pursuing certification or just want to start thinking "green," insulation systems—both individually or in combination with other building or equipment design options—can be vital to accomplishing your objectives.

Environmental stewardship is no longer just an option. The potential of green buildings being mandated in many industry segments is real. The proper design, installation, and maintenance of mechanical insulation should be a major consideration in all sustainable design initiatives.

Insulation Protects Workers

When was the last time you heard about mechanical insulation at a safety meeting? Protecting workers from contact with hot or cold surfaces should be a focus of any safety program. Insulation systems can be a vital component in applications related to life safety, such as commercial kitchen ducts, return air plenums, protection of power and communication conduit trays, and similar applications. Far beyond the impact on a company's bottom line is insulation's direct impact on employees' well-being.

Insulation also plays a role in fire safety through firestopping, which seals wall penetrations and prevents fire, gases, and smoke from migrating from one room to another.

Insulation Provides a Healthier Work Environment

Study after study has proven that improved indoor air quality increases occupants' productivity and efficiency. Noise control—whether in an office or a manufacturing facility—can increase productivity. Improved air quality and sound attenuation both benefit an occupant's health, productivity, and overall job satisfaction. Insulation can play a major role in accomplishing these goals.

Insulation Improves Process Control and Productivity

Most processes involve fluid, air, or gas leaving point A at one temperature or pressure and arriving at point B at another. The initial design incorporates a series of engineering assumptions. If the insulation system in the initial design is not installed and maintained, process control and productivity will suffer. A properly designed, installed, and maintained insulation system can provide the expected results or even improve upon them.

"We were pleasantly surprised by the results of our mechanical insulation energy assessment pilot program. We found that small items added up to large savings and that mechanical insulation provides opportunities for quick projects with good energy savings and return on investment. We will continue to assess mechanical insulation savings opportunities in more buildings."

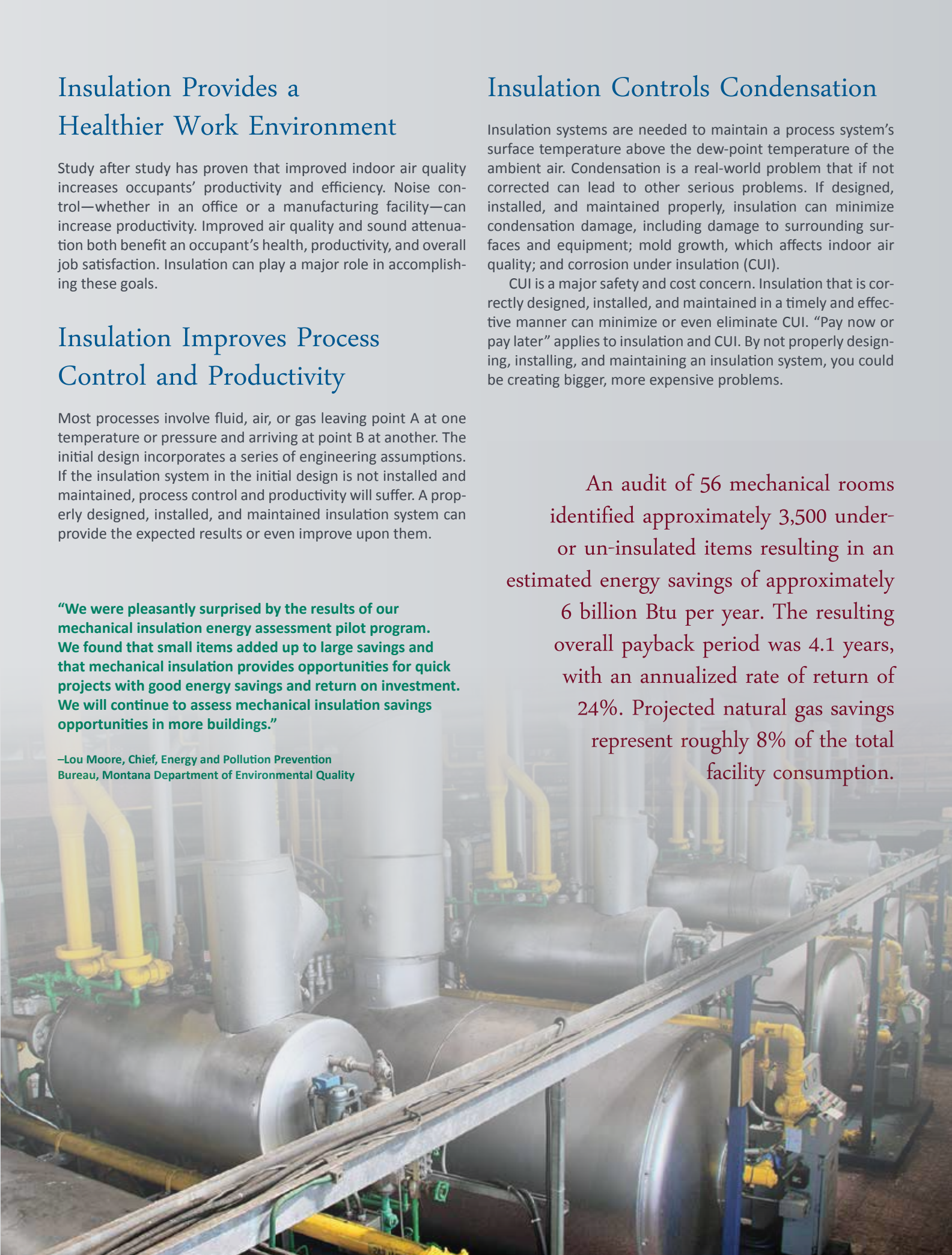
–Lou Moore, Chief, Energy and Pollution Prevention Bureau, Montana Department of Environmental Quality

Insulation Controls Condensation

Insulation systems are needed to maintain a process system's surface temperature above the dew-point temperature of the ambient air. Condensation is a real-world problem that if not corrected can lead to other serious problems. If designed, installed, and maintained properly, insulation can minimize condensation damage, including damage to surrounding surfaces and equipment; mold growth, which affects indoor air quality; and corrosion under insulation (CUI).

CUI is a major safety and cost concern. Insulation that is correctly designed, installed, and maintained in a timely and effective manner can minimize or even eliminate CUI. "Pay now or pay later" applies to insulation and CUI. By not properly designing, installing, and maintaining an insulation system, you could be creating bigger, more expensive problems.

An audit of 56 mechanical rooms identified approximately 3,500 under- or un-insulated items resulting in an estimated energy savings of approximately 6 billion Btu per year. The resulting overall payback period was 4.1 years, with an annualized rate of return of 24%. Projected natural gas savings represent roughly 8% of the total facility consumption.



The Power of Insulation

Insulation is a proven means for saving energy, reducing greenhouse gas emissions, increasing process productivity, providing a safer and more productive work environment, controlling condensation (which can lead to mold growth), supporting sustainable design technology, and a host of other benefits. It does all of this while providing an ROI that is seldom rivaled. So why is it so often overlooked?

Many people are more attracted to energy conservation solutions they think are more exciting or offer what they see as more quantifiable results. But a properly designed, installed, and maintained insulation system can provide short- and long-term benefits that exceed expectations, and the results are proven and quantifiable.

Insulation—
An Engineered Approach

An insulation system is a technology—one that needs to be engineered into a facility and maintained throughout its life. It has been estimated that between 10 and 30 percent of all installed insulation is now missing or damaged. Not replacing or maintaining an insulation system in a timely and correct manner means missing out on the full benefits of insulation. In many cases, significant issues develop, such as excessive energy loss, CUI, mold growth, increased cost of operations, and reduced process productivity.

Results Are Easy to Calculate

Insulation's ROI is no mystery. Software and assessment programs can calculate the amount of energy being saved with existing insulation systems or lost if the insulation is missing or damaged. They can also determine the potential dollar savings that can be obtained by upgrading an insulation system or replacing what is missing. These programs calculate the greenhouse gas emissions that could be prevented; insulation thicknesses required for condensation control, personnel protection, and surface temperatures; and the estimated ROI. The benefits of insulation are easily and quickly quantifiable; see the list of Resources on the back panel for tools.

Resources

Insulation.org

A world of information devoted to the mechanical insulation industry is available at *www.insulation.org.* The site boasts:

- A searchable database of technical articles
- A database of NIA's Certified Insulation Energy Appraisers, searchable by company name, last name, and location
- A Guide to Insulation Product Specifications
- The NIA Membership Directory & Resource Guide, searchable by member type, specialty, products, and location
- A bookstore offering books, DVDs, and brochures
- A free subscription to the NIA E-News Bulletin, which provides updates on association and industry news

Bookmark *www.insulation.org* and check it frequently for the latest NIA and industry news.

E-Learning Modules

The Mechanical Insulation Education and Awareness Campaign has produced a series of free E-Learning Modules. These interactive modules put valuable insulation information at your fingertips, from basics such as insulation terminology, a better understanding of energy, and the benefits of insulation to more complex topics such as design objectives and installation and maintenance. Whether you are new to the industry or a veteran, you will find these modules valuable tools. Learn more at *www.insulation.org.*

Simple Calculators

The Simple Calculators in the Mechanical Insulation Design Guide provide assistance for common calculations used in the design and analysis of mechanical insulation systems. These calculators are useful for both the beginner and experienced professionals. Calculators include: Energy Loss, Emission Reduction, Surface Temperature, and Annual Return for Equipment and Horizontal Piping; Financial Returns/Considerations; Personnel Protection for Horizontal Piping; and Temperature Drop for Air in an Insulated Duct or Fluid in an Insulated Pipe. Visit *www.wbdg.org/design/midg_calculators.php* for the complete list.

Mobile Apps

The Mechanical Insulation Financial Calculator app, based on the Financial Returns/Considerations Simple Calculator in the Mechanical Insulation Design Guide, helps quickly determine the financial returns related to investments in mechanical insulation. It can be used for an overall project or a small investment such as insulating a valve or replacing a section of insulation.

This app is available for Android phone users in the Android Market—just search for "mechanical insulation." Use this free tool to find out how quickly mechanical insulation can pay for itself in a building or facility and discover how much energy, money, and greenhouse gas emissions can be saved.

More apps for other smartphone operating systems will be available in the future. Check with NIA for availability.

MIDG

Whether you are looking for basic insulation information or need to design a complex insulation system, the Mechanical Insulation Design Guide (MIDG) is the best resource. Designed to assist the novice or the knowledgeable user alike in the design, selection, specification, installation, and maintenance of mechanical insulation, the MIDG is continually updated. Visit *www.wbdg.org/midg* for this free, comprehensive resource.

MTL Product Catalog

The MTL Product Catalog is the only online library of technical literature for the insulation industry. This one-stop shop for product information is the easiest way to find insulation product information. Visit it at *www.insulation.org/mtl*.

InsulationOutlook.com

The *Insulation Outlook* website is devoted to the needs of the magazine's readership of mechanical engineers, plant managers, specifiers, and other technical end-user professionals. *Insulation Outlook* produces high-quality information to educate its audience of more than 11,500 subscribers. The website features bonus materials, a searchable articles archive, a handy subscription-management area, additional information about advertisers, information for prospective writers, and more.

3E Plus® Software

The 3E Plus® Insulation Thickness Computer Program is a tool for selecting the appropriate insulation thickness needed to reduce heat loss or gain, maintain process-control temperature, maintain a safe surface temperature for personnel protection, and control condensation. The program can also calculate the quantity of greenhouse gas emissions (CO_2, NO_x, and others) associated with each thickness. The program includes thermal conductivity curves from current ASTM Material Specifications for most insulation materials. Users have the option of inputting thermal data from other sources if desired. Visit *www.pipeinsulation.org* to download the free software, or send an e-mail to the North American Insulation Manufacturers Association at *3Eplus@naima.org*.

About the National Insulation Association (NIA)

NIA is a not-for-profit trade association representing both the merit (open shop) and union contractors, distributors, laminators, fabricators, and manufacturers that provide thermal insulation, insulation accessories, and components to the commercial, mechanical, and industrial markets throughout the nation. Since 1953, the northern Virginia–based association has been the voice of the insulation industry and is dedicated to keeping the commercial and industrial insulation industry up to date on the latest industry trends and technologies. For more information about NIA, visit *www.insulation.org*.

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