A Win-Win: Cost Savings and Environmental Impact Revised:
Brent Niccum, CEO and Alysha Grosz, Global Marketing Coordinator Revision #:
Published: April 9, 2019

Many primary metal processors are concerned about reducing the environmental impact and operating cost of their metal processing operation. However, environmental solutions have not always been economically viable and have therefore fallen along the wayside. NCCM Company is confident its products and solutions benefit a company both economically and environmentally. Environmental action can produce multiple benefits for steel processing and automotive stamping companies today as they save on costs, bolster their reputations and preserve their resource pools responsibly for the future of industries. This is possible by implementing NCCM® nonwoven rolls into primary metal and automotive applications. NCCM® rolls decrease line operation costs and will easily provide positive return on the investment (ROI) not only through superior performance but also through several avenues of cost savings. Economic and environmental savings resulting from NCCM® nonwoven rolls include:

- Electricity usage reduction
- Carbon usage reduction
- Oil cost reduction
- Downtime reduction
- Logistical cost reduction

First, electrical usage. From the latest U.S. Energy Information Administration (EIA) data for the United States (2017), industrial companies (defined by the EIA as NAICS codes 31-33, 11, 21, 2212 and 23) consumed an average of 489,824 kilowatts of electricity per month.[1,2] With the average price per kilowatt at 7.98 cents, companies ended up spending an average of $469,055.52 on electricity each year.[1] This is a national average taken from 840,329 customers.[1]

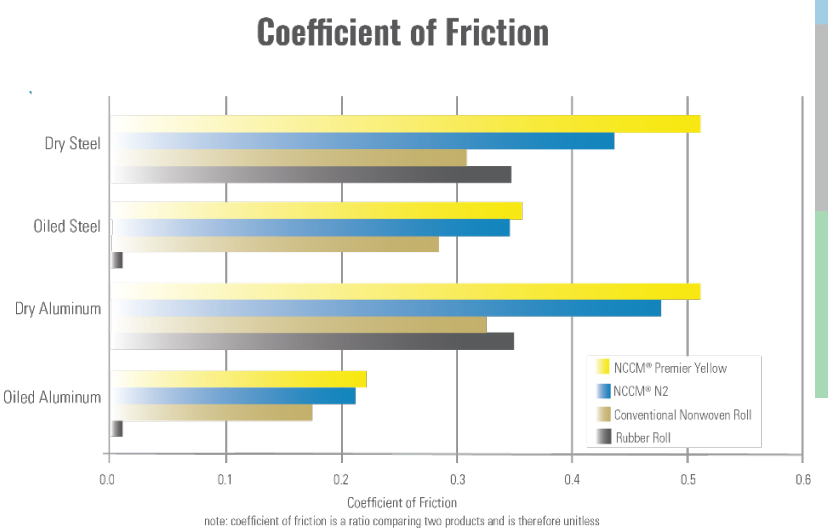


Figure 1: NCCM Presentation "Fluid Control"[3]

NCCM® nonwoven rolls can cut back on electrical costs significantly. NCCM® nonwoven rolls often cancel the need for driving motors and air dryers. When compared to rubber rolls, NCCM® nonwoven rolls have an extremely high coefficient of friction on oiled steel and aluminum strips. Due to this characteristic, some motors previously needed to compensate for slipping rolls are often no longer needed and can be stopped. This saves money not only in their operation from decreased electrical usage but also

in the motor's maintenance and upkeep. The electrical cost to operate a 10-horsepower motor for an eight-hour shift is $4.71.[4,5] Companies can extrapolate their spending from this statistic by multiplying the price by the number of motors and number of eight-hour shifts. Air dryers are also often eliminated or turned down. NCCM® Premier Yellow rolls maintain film thickness at a higher level for a longer period of time than competitor's rolls. The strip is therefore dried more thoroughly and can impact air dryer usage. This reduces money spent on electricity or upkeep.

The second economic and environmental factor to consider in the process of purchasing NCCM® nonwoven rolls is carbon usage. Carbon emissions are connected to electrical usage; one metric ton (tonne) of carbon emissions costs $84.99 in electrical costs.[1] As previously stated, NCCM® mill rolls cut back on carbon emissions and therefore on indirect and direct carbon costs. An example of a direct carbon cost is the cap and trade market, which requires companies to pay a fee per metric ton of carbon emitted. California has the highest-priced cap and trade system in the United States; one tonne of carbon costs $15, and plans are in place to raise the price to $26 by 2030.[6] One kilowatt of electricity from a coal-burning plant emits 2.07 pounds of carbon dioxide.[7] Companies are emitting an average of approximately 460 metric tons of CO_2 a month.[1] If the price of cap and trade carbon goes up to $26 per tonne, companies are looking at approximately $143,000 per year in carbon emissions cost from electricity usage alone. This system is not unique to the U.S.A.; in Europe, the cap and trade market price per carbon tonne is predicted to be €32 by 2023.[8] Initial price per tonne of carbon when Japan introduced its cap and trade system in 2010 was $142.[9] Regardless of plant location, portions of plant carbon cost could be reduced by eliminating or reducing motor and air heater use from switching to NCCM® nonwoven rolls.

An area in which NCCM® products excel is fluid control. For many blank washing applications, a consistent layer of oil is vital as the blank moves to the stamping phase of production. In other applications, fluid is wasted due to the amount of fluid needed to make the rolls work well. In either case, measurable and controlled fluid is important. In blank washing operations, well-controlled oil is necessary for proper stamping.[10] Excess fluid adds to operating costs, can create slipping hazards in the plant, can result in dangerous telescoping coils and can cause marking on the sheet. Less waste is generated when fluid is properly controlled and efficiently applied. The cost savings for properly controlled fluid versus poorly-managed fluid will differ from company to company, but a few simple numbers can illustrate the money-saving potential of proper wringing. Oil usage savings between 50-80% are common for many applications using NCCM® products. The oil price per barrel last reported in October 2018 was $63.55; therefore, a 55-gallon drum's price per gallon equals $1.16.[11] To apply these cost savings to a particular line, simply take oil usage for the line in question and multiply it by the cost of oil and the percentage range given above.

Downtimes are often scheduled for maintenance or occur unplanned. In either case, downtimes not only carry the cost of replacement rolls; they halt production, lower overall product output and lessen employee efficiency. Primary metal steel operations can cost $4,000 to $8,000 per hour of unplanned

downtime. Automotive lines, such as automotive stamping lines, are especially expensive to stop; one survey estimated costs as high as $1.32 million per hour of unplanned downtime.[12] Companies will have differing costs of downtime, but even at a modest estimate of $40,000 to $60,000 per hour of unplanned downtime for an automotive line, reducing downtime by even one hour a month would save companies anywhere from $480,000 to $720,000 a year. One of NCCM® products' prominent characteristics is long life; planned or unplanned downtime relating to changing and replacing rolls can be cut back substantially in many applications.

Another cost savings for both the environment and companies comes in the form of reduced logistical costs. NCCM® nonwoven rolls have been known to last up to 100 times longer than competitors' rolls. This factor will vary depending on line and application; a recent case study specifically cited NCCM® rolls as lasting 12 time longer than competitors in a reversing mill.[13] This translates into cost savings due to a decreased amount of replacement rolls, recovery material and cost related to the manufacturing process. Twelve times fewer rolls means fewer shipments for companies to pay for. Also, by having fewer backup rolls on hand, companies save storage space in their plant. Logistically, NCCM® nonwoven rolls save money, time and effort.

Electricity usage, carbon usage, fluid costs, planned downtime and logistical costs are just some of the ways NCCM® nonwoven rolls reduce environmental impact while saving you money. The positive ROI from NCCM® nonwoven rolls becomes apparent because of their environmental benefits resulting from key characteristics such as long life, cut resistance, superior fluid control and wringing, high coefficient of friction, noise reduction, self-healing properties and more. Contact us at sales@nccmco.com or (715) 425-5885 to better quantify the savings for specific applications and to find the product we can custom-engineer for specific applications. A greener planet starts with individual companies. Take this opportunity to improve business profitability while also helping the environment.

References:

[1]U.S. Energy Information Administration. "Electric Sales, Revenue, and Average Price – Energy Information Administration," 12 October 2018. [Online]. Available: https://www.eia.gov/electricity/sales_revenue_price/

[2]U.S. Energy Information Administration. "Table Definitions, Sources, and Explanatory Notes," 17 December 2018. [Online]. Available: https://www.eia.gov/dnav/pet/TblDefs/pet_pri_prop_tbldef2.asp

[3]D Benoy, "Fluid Control," River Falls, 2014 (graph revised April 9, 2019)

[4]D Silverman, "Energy Unites and Conversions," 02 January 2019. [Online]. Available: https://www.physics.uci.edu/~silverma/units.html

[5]B. Mirta. "How many units of electricity will be consumed if we run a 1 HP, 1-phase motor for 24 hours?" 02 January 2019. [Online]. Available: https://www.quora.com/How-many-units-of-electricity-will-be-consumed-if-we-run-a-1-HP-1-phase-motor-for-24-hours

[6]J. Larsen, "The Footprint of US Carbon Pricing Plans | Rhodium Group," 23 May 2018. [Online]. Available: https://rhg.com/research/the-footprint-of-us-carbon-pricing-plans/

[7]R. McLean, "How Much CO2 Emissions Per kWh of Electricity? – Carbon Positive Life," 24 May 2018. [Online]. Available: https://carbonpositivelife.com/co2-per-kwh-of-electricity/

[8]J. Hodges, E. Krukowska, and M. Carr, "Europe's $38 Billion Carbon Market Is Finally Doing Its Job," 26 March 2018. [Online]. Available: https://www.bloomberg.com/news/articles/2018-03-26/europe-s-38-billion-carbon-market-is-finally-starting-to-work

[9]D. Querejazu and editor?, "Fact Sheet – Carbon Pricing around the World," 17 October 2012. [Online]. Available: https://www.eesi.org/papers/view/fact-sheet-carbon-pricing-around-the-world?/fact-sheet-carbon-pricing-around-world-17-oct-2012

[10]B Niccum, "Proper Blank Washing is Fundamental to Quality," 2018. [Online]. Available: http://nccmco.com/pages/NCCM_White_Papers.html

[11]U.S. Energy Information Administration. "U.S. Crude Oil First Purchas Price," 3 December 2018. [Online]. Available: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=f000000__3&f=m

[12]E. Vadala and C. Graham, "Downtime Costs Auto Industry $22k/Minute – Survey," 29 March 2006. [Online]. Available: https://news.thomasnet.com/companystory/downtime-costs-auto-industry-22k-minute-survey-481017

[13]A. Grosz and D. Benoy, "NCCM Company CS-001," River Falls, 17 October 2018. Available upon request.