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U.S. Energy, Steel Benefit Each Other

By Doug Matthews

PITTSBURGH–Ongoing advancements in drilling and completion technologies are allowing our nation to unlock–in safe and environmentally responsible ways–the long-term benefits associated with domestic energy resource development. Much of that work has been spearheaded by U.S. oil and gas producers, whose efforts have done more than revitalize their own industry. Their work in recent years to discover, extract and transmit energy from areas once thought to be economically unfeasible is also positively impacting large commercial energy consumers, including steel makers such as United States Steel Corporation.

In recent decades, pervasive narratives proclaimed permanent declines for the U.S. industries that produce steel as well as oil and gas. For hydrocarbons, the theme focused on the geologic reality of finite resources in a mature producing region, and assumed natural gas was destined to follow crude oil on the road of perpetually increasing imports. American steel companies, meanwhile, faced the same hurdles that challenged many U.S. manufacturers, including competition from unfairly traded imported products. Much of the media reporting about North American manufacturing featured images of laid-off workers, shuttered facilities, and announcements from companies relocating their operations overseas.

While reality was never quite as simple as those dominant story lines, statistics suggest they were not without merit. The Information Technology & Innovation Foundation maintains that the 2000s constituted the worst decade for manufacturing employment in U.S. history, with the decline in the share of total manufacturing jobs surpassing that of the Great Depression. With natural gas, statistics from the U.S. Energy Information Administration show that imports grew almost continually since the mid-1980s, from 750.4 billion cubic feet in 1986 to 4.6 trillion cubic feet in 2007. At that time, the United States already was importing liquefied natural gas and more receiving terminals were in the works.

Yet in early 2013, as the broader U.S. economy struggles to maintain its footing–let alone find its stride–America's steel and oil and gas producers continue to provide some positive news. An IHS Global Insight analysis projects the direct upstream value generated by independent oil and gas producers should grow from $263 billion to $351 billion during this decade, while total upstream jobs are on pace to increase from 2.1 million to 2.6 million.

Likewise, the steel industry continues to work its way through the slow and uneven economic recovery and energy industry consumption of its products has played an important role in those efforts. Reports from the American Iron & Steel Institute show adjusted year-to-date production through Dec. 8, 2012 at 91.7 million tons at a capacity utilization rate of 75.8 percent, a 2.9 percent increase from 89.1 million tons produced during 2011, when the capacity utilization rate was 74.4 percent. While the industry continues to face challenges (including difficult economic conditions and sustained high import levels), steel tubular product sales helped steel makers achieve positive economic results while the economy endured recession and embarked on an unusually long road to recovery.

Lifeblood And Backbone

When the U.S. steel sector has been healthy and the country's oil and gas industry has thrived, that success has tended to spread, with energy serving as the country's lifeblood and steel constituting its backbone. Energy and steel are necessary components of manufacturing, a segment of the economy that benefits all consumers while also serving as a major source of good, sustainable, middle-class jobs.

Steel provides the foundation for manufacturing. Being able to manufacture the input products necessary for the durable goods people use in their daily lives–such as washing machines, dryers, refrigerators, stoves and automobiles–has helped provide the United States with the foundation upon which it can build a prosperous economy. It is a core manufacturing capability we must retain.

Unconventional resource development has transformed the outlook for U.S. onshore oil and gas production, but that is only part of the good news. The revamped long-term projections for stable supplies of affordable natural gas has steel makers in the United States taking notice, not only because of potential input savings, but also because the oil and gas industry offers domestic steel producers a ready market for products such as rigs, casing, and pipelines–products that can aid the energy industry's efforts to safely and effectively extract and transport these valuable domestic energy resources.

This synergy illustrates a simple concept: North American energy producers depend on North American manufacturers to consume energy, and North American manufacturers depend on North American energy producers to buy their goods and services. For example, if a North American steel company uses 100 million MMBtus of natural gas, a $1 swing in commodity prices immediately translates to $100 million in additional savings or costs. Moreover, such volumes are hardly fixed. A steel company may consume 7,000 MMBtus of North American-produced natural gas for every ton of steel pipe output, so as its output grows, so will its energy demand.

Energy Inputs

Natural gas prices need not remain consistently below $3 an MMBtu to play an important role in helping to revitalize U.S. manufacturing. Historically, price cycle volatility has tended to dissuade steel producers from relying too heavily on natural gas, but companies increasingly will turn to gas if they can be confident long-term natural gas prices are likely to remain in a $4-$6 range.

Steel producers have options for the energy inputs they use in their integrated steel making processes. For example, although a blast furnace needs a minimum level of coke to facilitate the iron smelting process, various types of thermal inputs can meet the process's full requirements.

Furthermore, the cost structures and environmental systems that go into build-

Despite the U.S. recession and sluggish economic recovery, steel tubular product sales have been a significant plus for U.S. steel companies. The ready market of a thriving North American oil and gas industry is good news for U.S. steel makers, while a strong domestic steel industry translates into more natural gas demand.

ing plants capable of converting coal into coke to support those blast furnaces are extremely capital intensive. Given the recent availability and affordability of natural gas in North America, as well as the volatility often associated with the seaborne coal and coke markets, many blast furnace steel makers, including United States Steel, have started to lower their blast furnaces' coke volumes and replace that coke with higher volumes of natural gas.

The implications of readily available, reasonably priced gas go further, though, and have some U.S. steel companies rethinking their capital structures and process flows. For instance, there are alternative ways to smelt raw iron, including the technique known as direct reduced iron (DRI), which is a technology with a well-established pedigree of success. Although steel makers throughout the world have built many of these units in regions with plentiful gas supplies during the past three decades, until recently, the long view on North American natural gas discouraged DRI investments here.

The cost to replace an aging coke battery with a "green field" one or to completely rebuild a blast furnace is counted in the hundreds of millions of dollars. However, employing DRI process technology can replace a similar amount of iron-making capability and costs much less to construct. Therefore, it only makes economic sense that steel companies are considering, and in some cases constructing, DRI facilities. And those DRI facilities that are built will require large amounts of natural gas to operate.

Air quality constitutes another reason to consider gas. Joint figures from the U.S. Department of Energy and the Norwegian Research Council show U.S. carbon dioxide emissions are declining, with published reports attributing a significant amount of that to increased natural gas use. The domestic steel industry has played a voluntary, active role in these efforts through its research and development investments and resulting new technologies. According to the American Iron & Steel Institute, between 1990 and 2010, the CO_2 intensity of each ton of steel produced in North America fell 33 percent while its energy intensity declined 27 percent.

While the United States has yet to establish regulatory standards for greenhouse gas emissions, the potential certainly exists. Regardless, the market incentives are drawing power and manufacturing companies to voluntarily opt for gas, which emits about half the GHGs of coal.

Because theirs is an energy-intensive manufacturing process, steel producers in the United States have been reluctant to rely heavily on fuels with highly variable pricing. However, as North America's reliable supply of affordable natural gas became clear, it changed the outlook for processes and technologies that rely on the fuel.

Fair Competition

Many oil and gas companies today are demonstrating their grasp of big-picture dynamics by adding natural gas vehicles to their company fleets. Although the scale of the U.S. transportation market may make any individual company's NGV fleet conversion seem inconsequential, these companies recognize the long-term investment value of being front-runners in the transportation market. The same kind of acumen recognizes the upside in opting for domestic steel products to help grow the demand base for U.S.-produced natural gas.

The truth is the United States does enjoy a number of key competitive advantages with regard to locating steel operations, including attractive markets, political stability, infrastructure and abundant raw materials.

Market proximity factors into product transportation costs and allows customers to know the mill and the people producing products–helping to ensure world-class reliability, quality, delivery and service.

Political stability is no minor consideration either. Even as Democratic and Republican electoral successes ebb and flow, governing philosophies here lack the type of radical swings experienced in some countries whose leadership changes are decided by uprisings or military coups rather than at the ballot box.

Infrastructure considerations also must weigh heavily, including the cost and availability of uninterrupted electrical service, which is not known to be a problem in the United States. Furthermore, North America has sufficient supplies of ore and enough coal to support coke production into the foreseeable future.

Adding abundant and affordable natural gas supplies to this list of attributes only makes North America that much more attractive. As steel manufacturers consider the new picture for natural gas, the United States looks to be an even better place to do business.

Nevertheless, more than 50 percent of the oil country tubular goods consumed in the United States in 2012 were imports. There is no doubt the United States should remain open to other countries' fairly traded goods and services. Likewise, oil and gas producers should choose OCTG that offer their companies genuine value and returns.

However, unfair foreign trade and unfair import pricing practices have caused enormous distortions and continue to threaten the development of sustainable, healthy markets. It may well be impossible for American producers to compete against

goods and services subsidized by foreign governments. Such trade practices have contributed mightily to the unsustainable trade imbalance from which the United States has suffered in recent decades.

While the United States has laws to enforce fair trade practices, their interpretation and implementation often requires a party to show substantial injury. A company or industry may have little hope of success if it appeals to the U.S. International Trade Commission before its balance sheet already shows considerable damage. As a policy matter, it is critical that our laws be implemented and enforced, to the maximum extent possible, to address market distortions before they have caused irreparable damage to American industries.

The domestic steel industry has not hesitated to file trade cases when conditions warrant such action, and we have won significant victories against China in recent years with regard to dumped and subsidized tubular products. In the meantime, while oil and gas groups work with policymakers to advocate for their interests, steel representatives will continue to advocate in Washington for enforcement of existing trade laws and action necessary to address all forms of market-distorting behavior, including currency manipulation and restrictions on key raw materials.

The U.S. energy industry's investments in technologies and processes designed to unlock the proven, vast energy resources that lay miles below ground have enabled our nation to achieve measurable economic and environmental progress while providing hope for additional gains in the future. To fully maximize this potential, oil and gas producers should give serious consideration to the products, goods and services supplied by North American manufacturers. Together, domestic manufacturers and the energy industry can spur additional job growth and economic revitalization here in the United States, and that's a scenario everyone can get behind. ❐

Success in a country's steel and energy sectors tends to spread throughout other areas of its economy. Both energy and steel are necessary components of manufacturing, a segment of the economy that benefits consumers and offers a major source of good, sustainable, middle-class jobs.

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