



ENVIRONMENTAL STEWARDSHIP

WHITE PAPER | OCTOBER 2020



Reliable and affordable energy is essential to modern life, but is often taken for granted. Flip a switch and the lights come on; push a button and your computer boots up; turn a dial and your home is warmer or cooler on demand. And within minutes, you can find gasoline on nearly any neighborhood corner. Yet behind that convenience is a complex set of supply chains that all begin with resource extraction; include massive distribution systems; and along the way, require a collection of facilities with varying footprints and profiles. Whether a particular energy source is derived from fossil fuel, nuclear or a renewable source, each has environmental impacts. As much as some might wish, no “impact-free” method of converting matter into energy has yet been developed. The important questions for each are: 1) do the social and economic benefits outweigh the environmental effects; and, 2) is the energy source developed in the most environmentally sensitive and sustainable means practicable?

For fossil fuels, the answers to those questions are “Yes!” Some opponents of energy development have spun a tale of energy companies unconstrained by laws or regulations. This is false. Energy projects are developed under and according to a framework of rules and regulations built up over decades to protect human health and the environment. Concerns about the impact of energy development are nothing new – they have been around for decades and strict state and federal regulations have been developed to directly address those concerns.

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Life requires natural resources – lands we farm and on which we live, water we use for drinking, cleaning and recreation, the very air we breathe – yet our lives also require energy, which comes primarily from fossil fuels found within the earth. Modern civilization is demonstrating that we can enjoy both a clean and safe environment, and abundant and affordable energy. With commitment, coordination and a disciplined approach, Kinder Morgan is safely, efficiently and reliably delivering energy-related products to major market centers across North America every day with minimal impacts to the environment. And our work in doing so is cleaner and safer year by year.



ENVIRONMENTAL IMPACTS OF RENEWABLES

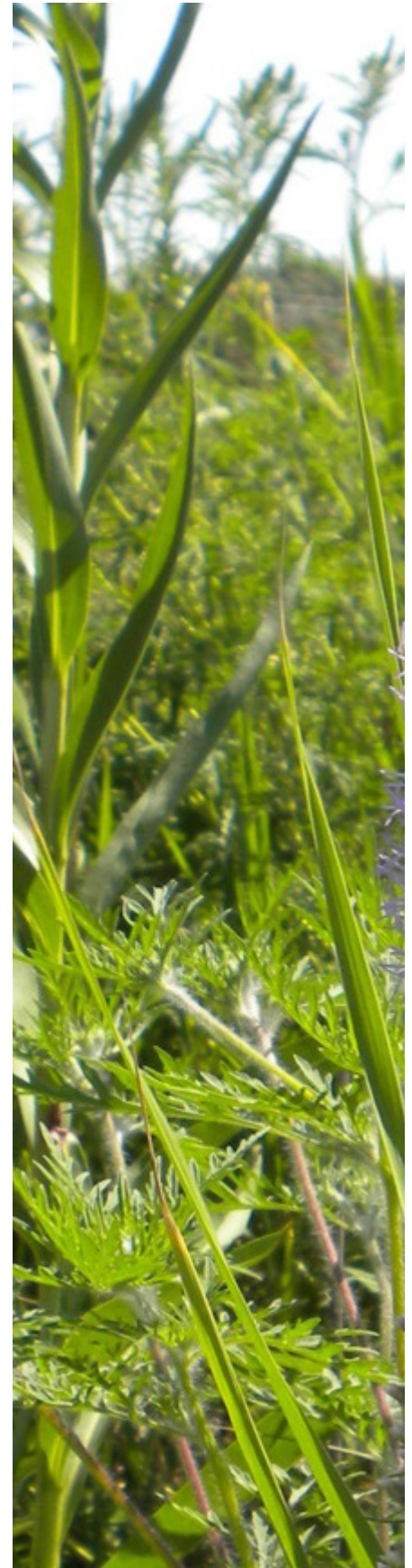
Energy is derived from multiple sources, whether it is from renewables, coal, nuclear, natural gas or petroleum, and there is no environmentally “pure” energy source. Nearly everything we do leaves a carbon footprint or contributes to conventional pollution emissions, and there are trade-offs for each decision we make. Even renewable sources such as wind, solar, geothermal, biomass and hydropower have environmental impacts – from emissions associated with steel production, land requirements, energy for installation equipment and related facilities, impacts to wildlife and habitat, as well as noise and visual pollution.

Massive land use constitutes one of the largest impacts of renewables. Wind farms require up to 141 acres per megawatt of power output.¹ And wind farms can only provide that power 35 percent of the time.² Compare that with a typical natural gas plant running at twice the capacity factor – and using 0.343 acres per megawatt to do so!³ Powering New York City would take a wind farm some 1,600 square miles in size, or about half of Yellowstone National Park.⁴ So in many cases, the responsible use of fossil fuels makes a great deal of sense for the environment.

Another downside to renewables is the lack of reliability. No one wants intermittent power or a fuel source that shuts on and off. The sun doesn’t always shine and the wind doesn’t always blow. How would hospitals operate non-stop without a steady source of power? How would factories run without continuous fuel?

Unreliable energy is worth less, considerably less, than reliable energy. Imagine the difference between a car that works reliably versus one that works only a third of the time. Yet, comparisons of the relative price of renewables and fossil fuels – meant to suggest they cost roughly the same – do not take this into account. Intermittent energy isn’t convenient or practical, and our expectation and experience of reliable energy is deeply rooted – and aspired to in societies across the globe.

One example of this is when a solar-and-battery microgrid was built for a rural village in India that had been waiting for decades to get access to central grid power. The villagers were disappointed to find that solar power was both expensive and unable to provide enough power for the village’s needs. When the former chief minister of Bihar State visited to inaugurate the solar microgrid, villagers lined up to protest, chanting: “We want real electricity, not fake electricity!”



¹ Union of Concerned Scientists, Environmental Impacts of Renewable Energy Technologies, Cambridge, MA, 2013, http://www.ucsusa.org/clean_energy/our-energy-choices/renewable-energy/environmental-impacts-of.html#.Vg6uT_IVkp

² http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_6_07_b

³ <https://www.strata.org/pdf/2017/footprints-full.pdf>

⁴ <https://engineering.mit.edu/engage/ask-an-engineer/how-many-wind-turbines-would-it-take-to-power-all-of-new-york-city/>

Reliable, continuous energy is clearly a necessity and not a luxury for developing nations.

There are also concerns about threats to biological diversity in some desert lands with the development of new, large-scale solar power plants that cover large territories. A study, published by the Carnegie Institution for Science and Stanford University, showed that the ecological footprint of solar power development could grow to more than 27,500 square miles, or roughly the land area of South Carolina, if the United States were to adopt a more ambitious climate goal.⁵ The study showed that when thousands of solar panels are built in undeveloped natural areas, the panels crowd out sensitive wildlife and destroy their natural habitat, including shrub and scrublands.

While renewables certainly have their place now and in the foreseeable future, there are trade offs and impacts in the use of all energy sources. Natural gas is the foundation for the sustained use of renewable energy. It cost-effectively anchors renewable technology by providing the flexibility necessary to balance and integrate renewable energy that varies, sometimes unpredictably. Fossil fuels will continue to be necessary to bridge the gap between renewables and a sustainable future for high consuming populations.

GROWING U.S. POPULATIONS EXPERIENCE REDUCED EMISSIONS

As populations and communities grow year over year, you would expect emissions to grow too. That simply is not the case for carbon dioxide emissions from power plants, one of the largest contributors of greenhouse gas emissions. In fact, according to the U.S. Environmental Protection Agency (EPA), carbon dioxide emissions have returned to 1993 levels, as natural gas-fired power plants have increasingly replaced coal-fired power plants. At roughly half the emissions from coal, natural gas has reduced overall carbon dioxide emissions despite increased net generation over the last two decades.

With natural gas production on the rise, the changing fuel mix for electric power generation (replacing coal with natural gas) contributes to the increased consumption of natural gas, as the energy industry recognizes the value of clean, affordable and reliable natural gas.

HIGH STANDARDS AND HIGHLY REGULATED

Kinder Morgan has been building pipelines for decades, and over that time, rules and regulations have been added to ensure safer operations and to minimize environmental, community and landowner impacts. Public outreach has been expanded over the years, and the codes and standards across all of our operations are rigorous and continuously evolving. This is no surprise – we've been at the forefront of these changes, working with, and at the direction of, regulators to supplement and enhance the programs that are in place.

Kinder Morgan works in coordination with multiple federal and state agencies to protect the environment during pipeline construction and through integrity management and ongoing day-to-day operations. The majority of our pipelines fall under the regulatory oversight of the U.S. Department

⁵ Scientific American, Solar Power Expansion Could Pose Ecological Risks, 2015
<http://www.scientificamerican.com/article/solar-power-expansion-could-pose-ecological-risks/>

of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) and its Office of Pipeline Safety. Additional agencies with oversight roles include the U.S. EPA, the Bureau of Land Management, the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service, as well as the Federal Energy Regulatory Commission.

THE ROLE OF THE U.S. EPA

The EPA is an agency of the U.S. federal government, established for the purpose of protecting human health and the environment by writing and enforcing regulations based on laws passed by Congress.⁶ Headquartered in Washington, D.C., the agency has the responsibility of maintaining and enforcing national standards established through many environmental laws, in consultation with state, tribal and local governments. It delegates some permitting, monitoring and enforcement responsibility to states and federally recognized tribes, and can enforce rules and regulations through fines, sanctions and other measures.

Several federal laws impacting the oil and gas industry address environmental concerns, and most are administered by the EPA. For instance, the Clean Air Act (CAA) was enacted in 1963 by Congress to control air pollution on a national level, and it regulates air emissions from stationary and mobile sources.⁷ It's considered to be one of the nation's first and most influential modern environmental laws and one of the most comprehensive air quality laws in the world. The law authorizes EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants. One of the goals of the CAA was to set and achieve NAAQS in every state, along with directing the states to develop state implementation plans, in order to achieve these standards.

In addition to legislation to protect the air, numerous studies have been conducted to determine the impact of fossil fuels on our air quality. One study, led by scientists at the National Institute of Water and Atmospheric Research and researchers from the National Oceanic and Atmospheric Administration and the Institute of Arctic and Alpine Research at the University of Colorado, concluded that increasing levels of methane in the atmosphere since 2007 are most likely due to agricultural practices and not fossil fuel production, as previously thought. The research indicates that most probable causes of the methane increases over the years are from either food production or climate-sensitive natural emissions, including wetlands, rice paddies and livestock.⁸

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Another piece of federal legislation with overarching impacts to the energy industry is the Clean Water Act (CWA),¹¹ which governs water pollution and was originally established as the Federal Water Pollution Control Act. It was later changed to the Federal Water Pollution Control Act Amendments of 1972, as it was reorganized and expanded. Additional amendments brought about the current CWA, which establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Under the CWA, it is unlawful to discharge any pollutant from a point source, such as through pipes or man-made ditches, into

⁶ <http://www.epa.gov/aboutepa/our-mission-and-what-we-do>

⁷ <http://www.epa.gov/laws-regulations/summary-clean-air-act>

⁸ Scientists attribute rising methane levels to agriculture, NIWA, March 2016
<https://niwa.co.nz/news/scientists-attribute-rising-methane-levels-to-agriculture>

⁹ <http://www.epa.gov/laws-regulations/summary-clean-water-act>

navigable waters, unless in accordance with a permit mandating treatment that ensures the effluent is suitable for discharge.

The Safe Drinking Water Act (SDWA)¹⁰ is the federal legislation that ensures that drinking water is safe for the public. Established in 1974, SDWA applies to every public water system in the United States. It requires EPA to establish National Primary Drinking Water Regulations for contaminants that may cause adverse public health effects and include both mandatory levels and health goals for each included contaminant. For compliance with the SDWA, public water systems are required to have personnel regularly monitor their water for contaminants, and those water samples must be analyzed using EPA-approved testing methods. The EPA's Office of Water (OW) ensures drinking water is safe, and restores and maintains oceans, watersheds and their aquatic ecosystems. OW is

responsible for implementing the CWA and SDWA, along with several other statutes.



In 1980, Congress passed the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as the Superfund Program.¹¹ CERCLA was enacted by Congress to address the dangers of abandoned or uncontrolled hazardous waste dumps by developing a nationwide program for emergency response, information gathering and analysis, liability for responsible parties and site cleanup. A Trust Fund, or Superfund, was created through CERCLA to finance emergency responses and cleanups. Over the years, changes were implemented and the Superfund Amendments and Reauthorization Act (SARA) of 1986 was enacted.¹² This Act added important minimum cleanup requirements (or removal actions) and remedial actions enforced through the federal courts for hazardous waste sites, as well as emergency plans to follow in case of a dangerous substance

release. Removal actions are typically short-term response actions, such as removing contaminated soils, while remedial actions involve long-term response efforts that seek to permanently and significantly reduce the risks associated with releases or threats of releases of hazardous substances.

These Acts are just some of the many statutes that have been enacted over the years to bring

¹⁰ <http://www.epa.gov/laws-regulations/summary-safe-drinking-water-act>

¹¹ Superfund: Protecting Human Health and the Environment for 35 years, US EPA
<http://www.epa.gov/superfund/superfund-history>

¹² Superfund Amendments and Reauthorization Act (SARA), New Georgia Encyclopedia
<http://www.georgiaencyclopedia.org/articles/geography-environment/superfund-amendments-and-reauthorization-act-sara>

oversight and enforcement of best practices to the energy industry. The related rules and regulations that EPA implements, along with many others, are in place to ensure clean air and water, and abundant natural resources for generations to come.

THE CONSTRUCTION PROCESS

Robust environmental protection associated with pipeline and terminal construction and operation begins with route selection, the timing of construction and the choice of construction techniques. Regulatory agencies at the federal and state level incorporate environmental considerations into their processes. Potential impacts on soils, aquatics, wetlands, native vegetation, wildlife and heritage resources are all first addressed through those basic decisions on routing, timing and technique.

A pipeline project is also required to obtain multiple environmental permits, and must comply with all applicable federal and/or state environmental regulations, such as the Clean Water Act, Endangered Species Act, Clean Air Act, the National Historic Preservation Act and many others. We work with relevant state agencies to obtain all required state permits, and per PHMSA regulations, the company prepares emergency and spill response plans for all new projects prior to the start of operations.

Through these partnerships – on a federal, state and county level – and with the enactment of several key pieces of legislation over the years, there is strong regulatory oversight across the oil and gas industry. This coordination and enforcement creates a series of checks and balances and promotes accountability for operators, thereby encouraging best practices and improved results.

OVERALL U.S. ENVIRONMENTAL PROGRESS

The oil and gas industry as a whole is continuously improving on health, environment and safety measures,¹³ with new regulations proposed and adopted regularly. In late 2015, PHMSA proposed new regulations that require quicker discovery of leaks, greater mitigation of environmental damages, and better risk management in densely populated communities and near significant waterways. Also in 2015, the EPA required Reduced Emissions Completions practices, commonly known as “green completions,” which route excess gas to sales, for new and refractured natural gas wells, thereby reducing emissions.¹⁴

Oil companies are now working in coordination with environmental organizations, scientists, biologists and engineers and have developed many solutions for spills occurring on land and in the water. For example, floating booms are immediately deployed to contain the spilled oil, and skimmers and vacuum pumps are used to cleanse the water and reclaim large percentages of spilled product. Another technique called “bio-remediation” uses living organisms such as fungi and bacteria, to degrade, break down and, in some cases, actually eat the oil as it safely cleanses the spill without hurting the environment.

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¹³ Energy API, Oil Spill Prevention + Response, Quick Facts – Spills Declining, <http://www.oilspillprevention.org/quick-oil-facts>

¹⁴ Environmental Defense Fund, Frequently Asked Questions: UT Methane Study https://www.edf.org/sites/default/files/content/ut_study_faq_for_web.pdf?utm_campaign=mb130930&utm_medium=cross-post&utm_source=care2



Elsewhere in the industry, technology upgrades are being used in drilling and refining practices to minimize pollution levels. Energy companies are learning from past mistakes and continue to invest time and resources into new programs and initiatives to change behavior and update antiquated practices.

As the industry evolves and continues to improve, Kinder Morgan is proud to be an early innovator and adopter of new recommended best practices. We often assist in the development of new industry policies and procedures through our involvement in the American Petroleum Institute (API), Common Ground Alliance, Interstate Natural Gas Association of America (INGAA), the Association of Oil Pipe Lines and as a founding member of the ONE Future Coalition. In fact, a former president of our products pipelines segment chaired a committee of diverse stakeholders for two years to create API Recommended Practice 1173 on Pipeline Safety Management Systems, which was published in 2015. Additionally, several members of Kinder Morgan management hold leadership roles on INGAA committees focused around health, environment, safety and improving stakeholder communication.

Today's energy companies recognize the importance of doing business with an emphasis on protecting the environment. Many voluntary sustainability programs across the globe have been implemented to do just that.

KINDER MORGAN'S FOCUS

Kinder Morgan is committed to conducting business according to the highest standards of environmental protection, with a focus on natural habitats, waterways and clean air. With that in mind, we emphasize preservation and restoration during construction and throughout the life of our projects – all with a vision of providing a path for a sustainable future.

PIPELINE INSPECTION AND MONITORING PROCESSES

Pipelines and storage facilities are “always open.” That means product flows continuously, around the clock, every day of the year. Pipelines and their associated facilities are monitored 24 hours a day, seven days a week, by personnel in control centers using a Supervisory Control and Data Acquisition (SCADA) computer system. This electronic surveillance system gathers such data

as pipeline pressures, volume and flow rates, and the status of pumping equipment and valves. Whenever operating conditions change, an alarm warns the operator on duty and the condition is investigated immediately. Both automated and manual valves are strategically placed along the pipeline system to enable the pipeline to be shut down immediately and sections to be isolated quickly, if necessary.

We also conduct visual inspections of our pipeline right-of-way by air and/or ground on a regular basis. The right-of-way is a narrow strip of land reserved for the pipeline. Above ground marker signs are displayed along the right-of-way to alert the public and contractors to the existence of the pipeline.

Internal inspections are conducted periodically by passing sophisticated computerized equipment called "smart pigs" through most of our pipelines to conduct analysis, gather data and to confirm the integrity of the pipe.

Additionally, cathodic protection is a technology we use that is designed to protect pipelines from external corrosion through the use of an electrostatic current. The small electrical charge is applied to our pipelines, which have an external protective coating.

Kinder Morgan also has a public awareness program designed to prevent third-party damage to our pipelines. The company is a member of numerous "call-before-you-dig" programs or "one-call" systems across the United States, which are designed to help the public, contractors and others identify the location of pipelines before excavation or digging projects to prevent damage to pipelines and protect the public. The leading cause of pipeline accidents is third-party damage caused by various types of digging and excavation activities.

Emergency preparedness and planning measures are in place at Kinder Morgan in the event that a pipeline incident occurs. The company also works closely with local emergency response

organizations to educate them regarding our pipelines and how to respond in the unlikely event of an emergency.



PROTECTING OUR LAND

Preservation of land is a key component of any construction effort, whether in designing a new route for a pipeline project or when performing maintenance on facilities that have been in service for many years. To evaluate a proposed route on a new pipeline project, Kinder Morgan conducts civil, cultural and environmental surveys to gather information related to soil, topography, water sampling and so forth to determine the most appropriate route and to avoid and minimize impacts on critical habitats and lands.

Following construction of new facilities, the company restores the right-of-way in accordance with applicable rules and regulations, including seeding and fertilizing the property to landowner specifications. In many instances, the land is improved upon, as indicated in the photos below for our Tennessee Gas Pipeline (TGP) system.



TGP Right-of-Way Pre-Construction 3/29/2013



TGP Right-of-Way Post-Construction 9/26/2013

The company also focuses on wildlife preservation in sensitive areas, and being good land stewards requires extra attention in areas impacted by construction. One example of this includes pollinator conservation programs along rights-of-way to protect essential habitats for future growth and development. In 2015, our terminals group received the Rookie of the Year Award and Pollinator Advocate Award from the Wildlife Habitat Council for pollinator programs at our Hartford Terminal in Tampa, Florida. We continue to partner with environmental agencies to evaluate other pollinator programs across our system and how we can replicate successes and incorporate best practices for the protection of all endangered species.

PROTECTING OUR WATER

Waterways play a vital role in our ecosystem, and as a major transporter of energy-related products, we partner with the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency, as well as state and county bureaus, to mitigate or avoid operational impacts to nearby wetlands. Some mitigation takes the form of lasting benefits for the communities near our projects.

For instance, we have been honored with a Governor's environmental award by the New Jersey Department of Environmental Protection for work to remove three outdated dams on the Raritan River in New Jersey. The project restored free-flow, migratory fish passage to spawning grounds, restored pond ecosystems at a nearby major farm and lowered nutrient levels in ponds, benefiting migratory birds.

Another award-winning project was a three-acre oyster reef off the shoreline near our Elizabeth River terminal in Chesapeake, Virginia. That project received a Sustained Distinguished Performance award from the Elizabeth River Project's River Star program.

PROTECTING OUR AIR

Kinder Morgan's facilities meet or exceed national air quality standards that protect human health, including the health of sensitive populations such as children, the elderly and those with chronic respiratory problems.

Kinder Morgan has gone beyond regulatory requirements to become a founding member of One Nation's Energy Future (ONE Future), a coalition of companies committed to voluntarily reducing methane emissions to 1 percent or less of domestic production by 2025. In conjunction with ONE Future, Kinder Morgan has taken a leadership role working with the EPA to identify the most effective means for reducing methane emissions from natural gas transmission and storage operations.

In summary, Kinder Morgan and all of our employees take their commitment to the environment very seriously. After all, our employees fish, hike, hunt and raise children in communities where they live and work. For the many Kinder Morgan employees who maintain our sterling operational record, and who volunteer consistently with non-profit organizations focused on preserving the environment, our corporate commitment is an expression of a shared sense of purpose that will leave a lasting positive impact for years to come.