

Chapter 19

Atomic Power, Fossil Fuels, and the Environment: Lessons Learned and The Lasting Impact of the Kennedy Energy Policies

Joshua P. Fershee

Abstract: Because of his short term of office, President Kennedy's energy policies have not been critiqued, reviewed, or analyzed in the same manner, or to the same degree, as other administrations. This essay fills part of that void by reviewing the key components of President Kennedy's energy and environmental goals and policies that managed to have a lasting impact, despite his short term in office, and discusses the results of those policies, both positive and negative. Through this review, President Kennedy's policies can become a resource and roadmap for the current Administration and all those who seek to ensure access to affordable energy while preserving the environment.

This essay considers the motivation behind President Kennedy's key energy initiatives and proposed legislation and puts that motivation in context. More specifically, the essay discusses some of President Kennedy's key energy initiatives, in light of the technological, regulatory, economic, and political (domestic and international) climate of the Kennedy years and compares President Kennedy's key initiatives to the concerns the United States faces today. From nuclear energy to coal-fired power to electricity infrastructure, this comparison indicates that President Kennedy's energy and environmental policies were both insightful and prescient, but not without consequences.

There are two points on conservation that have come home to me in the last 2 days. One is the necessity for us to protect what we already have, what nature gave to us, and use it well, not to waste water or land, to set aside land and water, recreation, wilderness, and all the rest now so that it will be available to those who come in the future. That is the traditional concept of conservation, and it still has a major part in the national life of the United States.

But the other part of conservation is the newer part, and that is to use science and technology to achieve significant breakthroughs as we are doing today, and in that way to conserve the resources which 10 or 20 or 30 years ago may have been wholly unknown. So we use nuclear power for peaceful purposes and power.

-- President John. F. Kennedy, Sept. 26, 1963¹

Introduction

When President Barack Obama took office in 2009, the comparisons to President John F. Kennedy, Jr., were inevitable. An engaging and energetic young president had just been sworn into office during complex and rapidly changing times. In 2008, late-Senator Edward M. “Ted” Kennedy compared then-Democratic presidential nominee Obama and his brother, President Kennedy: “There is a new wave of change all around us, and if we set our compass true, we will reach our destination—not merely victory for our party, but renewal for our nation. . . . [S]o with Barack Obama . . . the dream lives on.”²

In comparing President Obama to President Kennedy, both are often viewed as cultural icons “who by [their] very existence denote a new social order” and are “youthful renewer[s] of the American spirit.”³ From a policy perspective, though, President Obama is more often compared to Abraham Lincoln or Franklin Delano Roosevelt, than President Kennedy.⁴ Regardless of the appropriateness of these comparisons, this essay argues that President Obama has much to gain from looking to President Kennedy’s policies, not just his rhetoric, especially in setting energy policy.

Because of his short term of office,⁵ President Kennedy’s energy policies have not been critiqued, reviewed, or analyzed in the same manner as other administrations.⁶

¹ John F. Kennedy, Remarks, *Remarks at the Electric Generating Plant*, (Hanford, WA, Sept. 26, 1963), in JOHN F. KENNEDY IN HIS OWN WORDS 76 (Eric Freedman & Edward Hoffman eds., 2005)

² ROBERT DENTON, JR., THE 2008 PRESIDENTIAL CAMPAIGN: A COMMUNICATION PERSPECTIVE 23 (2009) (quoting Senator Ted Kennedy’s address to the 2008 Democratic National Convention).

³ See Matt Bai, *Don’t Look Back*, N.Y. TIMES, Feb. 1, 2009, § MM, at 9.

⁴ *Id.* (stating that viewing President Obama as “crisis President” leads comparisons to Lincoln and FDR, but “as cultural icon” President Kennedy is a more apt comparison).

⁵ See THE NATIONAL ARCHIVES, OUR DOCUMENTS: 100 MILESTONE DOCUMENTS FROM THE NATIONAL ARCHIVES 220 (2003) (stating that the Cold War shaped President Eisenhower’s presidency and that it “would dominate President Kennedy’s own short term of office”).

This essay seeks to fill part of that void by reviewing the key components of President Kennedy's energy and environmental goals and policies that managed to have a lasting impact, despite his short term in office, and discussing the results of those policies, both positive and negative. Through this review, President Kennedy's policies can become a resource and roadmap for the current Administration and all those who seek to ensure access to affordable energy while preserving the environment.⁷

This essay considers the motivation behind President Kennedy's key energy initiatives and proposed legislation and puts that motivation in context. More specifically, the essay discusses some of President Kennedy's key energy initiatives, in light of the technological, regulatory, economic, and political (domestic and international) climate of the Kennedy years and compares President Kennedy's key initiatives to the concerns the United States faces today. This comparison indicates that President Kennedy's energy and environmental policies were both insightful and prescient, but not without consequences.

I. The Broad and Complex Nature of the Kennedy Energy Policies

President John F. Kennedy's forward-thinking, yet pragmatic, energy and environmental policies were, and are, uniquely comprehensive and coherent. The concerns facing the Kennedy Administration were not that different from the concerns facing the world today. Not since President Kennedy's era have energy, environmental, and public safety issues been so intertwined. Although many of the specific issues have changed over the past fifty years, President Kennedy's policies provide a useful model in developing ways to address modern concerns.

President John F. Kennedy's short time in the White House provides a somewhat conflicted record. President Kennedy is often, and accurately, portrayed as an environmentalist⁸ and a civil rights advocate.⁹ He was also a major supporter of space exploration and atomic power, and, perhaps above all, he was committed to foreign

⁶ See Major Bruce D. Page, Jr., Book Review: *American Theocracy: The Peril and Politics of Radical Religion, Oil, and Borrowed Money in the 21st Century*, 190/191 MILITARY L. REV. 175, 177 n.12 (2007) ("In [this book], Phillips reviews the oil policies of every American president from Dwight Eisenhower to Bill Clinton, excluding John F. Kennedy.").

⁷ See President Barack Obama, Remarks at Southern California Edison Electric Vehicle Technical Center (Mar. 19, 2009), available at <http://www.energy.gov/news2009/7067.htm> (providing President Obama's remarks as they were prepared for delivery) ("We can remain one of the world's leading importers of foreign oil, or we can make the investments that will allow us to become the world's leading exporter of renewable energy. We can let climate change continue to go unchecked, or we can help stem it.").

⁸ See BENJAMIN KLINE, *FIRST ALONG THE RIVER: A BRIEF HISTORY OF THE U.S. ENVIRONMENTAL MOVEMENT 75-76* (3rd ed. 2007).

⁹ THEODORE C. SORENSON, *KENNEDY 470* (1965).

policy.¹⁰ His policies reflected the complex and difficult nature of the issues of the time. Even when some of his Administration's policies seemed to conflict with many of his primary goals, most of the policy decisions were part of a coherent, if complex, plan.

The complexity of President Kennedy's policies was visible in nearly every key issue. An outspoken champion of civil rights, President Kennedy did not move forward on legislation until two years into his term,¹¹ when racial violence largely forced the issue.¹² He founded the Peace Corps to help promote peace and prosperity in the world,¹³ yet his policies also set the stage for the Vietnam War.¹⁴ An ardent supporter of the environment,¹⁵ he also advocated expansion of nuclear power for civilian use¹⁶ and proposed and supported construction of coal slurry pipelines.¹⁷

Complex times lead to complex policies. Such were, and are, the times. As President Kennedy explained to the United Nations in 1963, "Never before has man had such capacity to control his own environment We have the power to make this the best generation of mankind in the history of the world—or to make it the last."¹⁸ This remains true today.

President Kennedy, more than 40 years ago, predicted that

if we fail to chart a proper course of conservation and development—if we fail to use these blessings prudently—we will be in trouble within a short time. In the resource field, predictions of future use have been consistently understated. But even under conservative projections, we face a future of critical shortages and handicaps. By the year 2000, a United States population of 300 million—nearly doubled in 40 years—will need far greater supplies of farm products, timber, water, minerals, fuels, energy,

¹⁰ See *id.* at 509-528.

¹¹ HERBERT S. PARMET, *JFK: THE PRESIDENCY OF JOHN F. KENNEDY* 271-72 (1983).

¹² *Id.* at 264-65.

¹³ SORENSON, *supra* note 9, at 531-32.

¹⁴ Lawrence J. Bassett & Stephen E. Pelz, *The Failed Search for Victory: Vietnam and the Politics of War* in *KENNEDY'S QUEST FOR VICTORY: AMERICAN FOREIGN POLICY, 1961-1963*, at 223-52 (Thomas G. Paterson ed., 1989).

¹⁵ See KLEIN, *supra* note 8, at 75-76.

¹⁶ See CRAUFURD D. W. GOODWIN, *ENERGY POLICY IN PERSPECTIVE: TODAY'S PROBLEMS, YESTERDAY'S SOLUTIONS* 324 (1983)

¹⁷ See ROBERT GLENNON, *WATER FOLLIES: GROUNDWATER PUMPING AND THE FATE OF AMERICA'S FRESH WATERS* 155 (2004).

¹⁸ President John F. Kennedy, Jr., Address Before the 18th General Assembly of the United Nations (Sept. 20, 1963), *available at*

http://www.jfklibrary.org/Historical+Resources/Archives/Reference+Desk/Speeches/JFK/003POF03_18thGeneralAssembly09201963.htm (providing a transcript of the address, as well as the audio file).

and opportunities for outdoor recreation. Present projections tell us that our water use will double in the next 20 years; that we are harvesting our supply of high-grade timber more rapidly than the development of new growth; that too much of our fertile topsoil is being washed away; that our minerals are being exhausted at increasing rates; and that the Nation's remaining undeveloped areas of great natural beauty are being rapidly pre-empted for other uses.¹⁹

On many of these issues, President Kennedy was right, or at least in the ballpark. The U.S. population in 1963 was approximately 189 million people. In 2000, it was more than 280 million.²⁰ It was not until approximately 2007 that the population actually hit 300 million people,²¹ a mere seven years "late." As for water supply, President Kennedy was right that water needs would increase greatly. Total water withdrawals for all uses in 1960 were 270 billion gallons per day (Bgd).²² By 1980, that number reached a peak use of 440 Bgd; twenty years later, the number had decreased to 408 Bgd.²³

Despite the difficult and complex problems facing the world, or perhaps because of them, President Kennedy uniquely recognized the need to have comprehensive energy and environmental policies. Early in his administration, President Kennedy sought to combine "the widely scattered resource policies of the Federal Government."²⁴ He noted that prior policies "overlapped and often conflicted" and that funds were often "wasted on competing efforts."²⁵ As such, he sought to provide consistent standards when measuring the proper Federal contribution to similar projects.²⁶ Perhaps most important, he recognized that "[f]unds and attention devoted to annual appropriations or immediate

¹⁹ John F. Kennedy, Special Message, *Special Message to the Congress on Natural Resources* (Washington, D.C., Feb. 23, 1961).

²⁰ U.S. Census Bureau, Census 2000 Demographic Profile Highlights, at http://factfinder.census.gov/servlet/SAFFacts?_event=&geo_id=01000US&_geoContext=01000US&_street=&_county=&_cityTown=&_state=&_zip=&_lang=en&_sse=on&ActiveGeoDiv=&_useEV=&pctxt=fph&_pgsl=010&_submenuId=factsheet_1&_ds_name=ACS_2006_SAFF&_ci_nbr=null&_qr_name=null&_reg=&_keyword=&_industry= (last visited Aug. 28, 2009).

²¹ U.S. Census Bureau, 2005-2007 American Community Survey 3-Year Estimates, at http://factfinder.census.gov/servlet/ACSSAFFacts?_event=&geo_id=01000US&_geoContext=01000US&_street=&_county=&_cityTown=&_state=&_zip=&_lang=en&_sse=on&ActiveGeoDiv=&_useEV=&pctxt=fph&_pgsl=010&_submenuId=factsheet_1&_ds_name=DEC_2000_SAFF&_ci_nbr=null&_qr_name=null&_reg=null%3Anull&_keyword=&_industry=

²² USGS Estimated Water Use in the United States in 2000, <http://pubs.usgs.gov/circ/2004/circ1268/htdocs/table14.html>

²³ USGS Estimated Water Use in the United States in 2000, <http://pubs.usgs.gov/circ/2004/circ1268/htdocs/table14.html>

²⁴ John F. Kennedy, Special Message, *Special Message to the Congress on Natural Resources* (Washington, D.C., Feb. 23, 1961).

²⁵ *Id.*

²⁶ *Id.*

pressures divert energies away from long-range planning for national economic growth.”²⁷ Although his policies did not always reach this standard, no president since has had such a comprehensive energy plan.

Many of the issues are similar today, but the problems have evolved, and in many cases expanded. We still face concerns about nuclear proliferation, but instead of primarily being concerned with the Soviet Union,²⁸ our concerns include Iran, Russia, China, North Korea, and Pakistan, among others.²⁹ This diffusion of possible sources has changed how the public views nuclear threats. Now, the concern about potential threats largely focuses on terrorist activity and how that activity will be funded. This, in turn, raises concern about foreign fuel sources, because so much of the world’s fossil fuels are controlled by potentially antagonistic regimes.

In addition, in 2008, as in 1963, we face significant concerns about the environment. Beyond clean air and water – areas where we have made at least some progress – climate change is now a major issue. And access to, and consumption of, foreign resources (particularly oil) are still a major concern. President Kennedy’s policies, and the process through which they were developed, can help shed some light on the critical energy and environmental issues facing the world today. With the benefit of hindsight, President Kennedy’s policies provide valuable guidance, indicating what might work, what should be avoided, and the difficulty in determining which is which.

A. The Power of (and from) Nuclear Proliferation

President Kennedy’s pragmatic and forward-thinking views were apparent in his strong support for atomic energy. This support was based on two key premises. First, he believed that having a civilian use for atomic power was essential to managing nuclear proliferation.³⁰ He argued that those who believed the United States should not commit “to being a leader in the peacetime use of atomic energy,” were choosing to waste resources and “say[ing] no to [the] country.”³¹ Accordingly, he argued, the Atomic Energy Commission, needed to take a “hard look at the role of nuclear power in our economy in cooperation with the Department of the Interior, the Federal Power Commission, other appropriate agencies, and private industry.”³²

²⁷ *Id.*

²⁸ See MICHAEL O'BRIEN, JOHN F. KENNEDY: A BIOGRAPHY 351-52 (2005).

²⁹ See Graham T. Allison, Nuclear Terrorism: The Ultimate Preventable Catastrophe 74 (2004).

³⁰ See Letter from John F. Kennedy, President of the United States, to the Chairman of the Atomic Energy Commission, *The Development of Civilian Nuclear Power*, (March 17, 1962) (“The development of civilian nuclear power involves both national and international interests of the United States.”).

³¹ John F. Kennedy, Remarks, Remarks in Seattle at the Silver Anniversary Dinner Honoring Senator Magnuson (Seattle, WA, Nov. 16, 1961).

³² See Letter from John F. Kennedy, President of the United States, to the Chairman of the Atomic Energy Commission, *The Development of Civilian Nuclear Power*, (March 17, 1962).

Second, he believed that economically competitive nuclear power could be realized relatively quickly, especially in areas where fossil fuel costs were high.³³ The President believed that the base of U.S. energy resources needed to expand to promote economic growth.³⁴ Plus, with so much time and money already put into the nuclear program, President Kennedy sought to find additional ways to put that investment to work.

The first major U.S. atomic energy project was the Hanford Nuclear Weapons Reservation (Hanford), which was located near Hanford, Washington.³⁵ Built during World War II, Hanford was the first full-scale plutonium manufacturing facility in the world.³⁶ Hanford covers 560-square miles and is adjacent to the Columbia River,³⁷ which provided the “abundant, clean water supply” that was needed for cooling.³⁸ Operations started in 1944, and Hanford soon produced the bulk of the plutonium for the U.S. nuclear weapons program, including that which was used for the atomic bomb dropped on Nagasaki.³⁹

President Kennedy was adamant that the steam produced as a by-product of Hanford’s operations should be used to generate electricity. He strongly supported the Washington Power Supply System proposal to use the steam produced by Hanford to produce power, arguing that it presented “an opportunity, dearly in the public interest, to obtain the maximum benefits from the public investment already committed for this facility and to demonstrate national leadership in resources development while furthering national defense objectives.”⁴⁰ He congratulated Congress “on the success of their unremitting efforts” to use the by-product steam of the Hanford reactor.⁴¹ “[I]t is clearly in the public interest to utilize the heat output of the Hanford reactor, and to obtain

³³ See John F. Kennedy, Special Message, *Special Message to the Congress on Natural Resources* (Washington, D.C., Feb. 23, 1961). (“[E]conomically competitive nuclear power [can be achieved] before the end of this decade in areas where fossil fuel costs are high will be encouraged through basic research, engineering developments, and construction of various prototype and full scale reactors by the Atomic Energy Commission in cooperation with industry.”)

³⁴ See Letter from John F. Kennedy, President of the United States, to the Chairman of the Atomic Energy Commission, *The Development of Civilian Nuclear Power*, (March 17, 1962) (“The development of civilian nuclear power involves both national and international interests of the United States.”).

³⁵ See *In re Hanford Nuclear Reservation Litig.*, 292 F.3d 1124, 1127 (2002).

³⁶ *Id.*

³⁷ *Id.*

³⁸ See Michele Gerber, *Legend and Legacy: Fifty Years of Defense Production at the Hanford Site*. Prepared for the U.S. Department of Energy, Office of Environmental Restoration and Waste Management at 6 (1992).

³⁹ *In re Hanford Nuclear Reservation Litig.*, 292 F.3d at 1127.

⁴⁰ Letter from John F. Kennedy, President of the United States, to the Chairman of the Joint Committee on Atomic Energy, *The Use of By-Product Steam from the Hanford Nuclear Reactor*, (July 14, 1962).

⁴¹ *Id.*

maximum benefits from the public investment already committed for this facility if there is a feasible way to do so.”⁴²

In his remarks at the Hanford generating plant, President Kennedy applauded the commencement of “work on the largest nuclear power reactor for peaceful purposes in the world.”⁴³ He noted, “I think this is a good area where we should be first, and we are first.”⁴⁴

President Kennedy also talked of using Hanford to promote conservation. He believed that, in addition to traditional notions of conservation, science and technology could achieve breakthroughs to conserve resources in ways that were previously unidentified.⁴⁵ So, he said, “we use nuclear power for peaceful purposes and power.”⁴⁶

The science used at Hanford would prove to be both a benefit and burden. By 1963, Hanford had nine nuclear reactors along the Columbia River.⁴⁷ The original three World War II reactors were updated and expanded, and 177 underground waste tanks were built.⁴⁸ During 40 years of operations, Hanford produced the plutonium supply for the majority of the United States’ 60,000 nuclear weapons.⁴⁹ Plainly, the transition from making bombs to making electricity was not as easy as it may have appeared.⁵⁰ Despite President Kennedy’s insistence that the by-product steam be used for electricity, the science of using nuclear power to generate electricity was an entirely new undertaking.⁵¹ As but one hurdle, plutonium for bombs was produced using low-temperature reactors; steam for the electricity generating turbines required a much higher temperature.⁵²

The N Reactor, the last plant constructed on the Hanford site, combined plutonium production and steam generation of commercial electric power.⁵³ The N

⁴² John F. Kennedy, Message, *Annual Budget Message to the Congress, Fiscal Year 1964*, (Washington, D.C., Jan. 17, 1963).

⁴³ John F. Kennedy, Remarks, *Remarks at the Electric Generating Plant*, (Hanford, WA, Sept. 26, 1963).

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ Dep’t of Energy, Richland Operations Office, Office of River Protection, Hanford Overview, <http://www.hanford.gov/?page=215>.

⁴⁸ *See id.*

⁴⁹ *See id.*

⁵⁰ GWENYTH CRAVES, *POWER TO SAVE THE WORLD: THE TRUTH ABOUT NUCLEAR ENERGY* 163 (2008).

⁵¹ *Id.*

⁵² *Id.*

⁵³ *See* MICHELE GERBER, *LEGEND AND LEGACY: FIFTY YEARS OF DEFENSE PRODUCTION AT THE HANFORD SITE 31* (1992), *available at* http://www5.hanford.gov/pdw/fsd/AR/FSD0001/FSD0037/D196136628/D196136628_13223_66.pdf (Prepared for the U.S. Department of Energy, Office of Environmental Restoration and Waste Management).

Reactor produced more than 65 billion kilowatts of electricity in 24 years, making the N Reactor the largest electric power producer in the nation during its early years.⁵⁴

As would be expected (at least today), Hanford also proved to be a major environmental hazard. In fact, “[t]he clean-up of American military nuclear waste is the biggest environmental program as well as the biggest public works program in the history of the world, surpassing the Manhattan Project and the space program combined.”⁵⁵ In the mid-1950s, leaks in the single-shell, high-level waste storage tanks were confirmed.⁵⁶ Other concerns surrounded the Columbia River, which supplied the water used for cooling the operations. By 1960, wastewater from Hanford discharged 14,500 curies per day into the Columbia River.⁵⁷ Recognizing this concern, “Hanford and Atomic Energy Commission leaders discussed rising levels of contamination in fish tissues in the river and in shellfish in coastal waters near the river’s mouth.”⁵⁸

Hanford’s eight single-pass reactors shut down between 1964 and 1971.⁵⁹ Following the shutdowns, some reports noted that “radionuclide levels in river water and organisms decreased, and by 1975, only a small measurable burden existed, mainly in the sediments of blind sloughs and of areas behind dams.”⁶⁰ However, during operation, “these reactors discharged billions of gallons of cooling water, laden with fission and activation products, to the river and to the ground.”⁶¹

In the aftermath, the United States Department of Energy (DOE), in 1987, created the Hanford Environmental Dose Reconstruction Project (HEDR), which was overseen by the Centers for Disease Control.⁶² The HEDR was created “to estimate and reconstruct all radionuclide emissions from Hanford from 1944 to 1972, in order to ascertain whether neighboring individuals and animals had been exposed to harmful doses of radiation.”⁶³ The HEDR analyzed Hanford emissions over a 75,000-square-mile area and examined “how radiation traveled through the air, settled into the soil, and dispersed into ground and surface water, and the resulting exposure to individuals who lived in the surrounding urban and suburban areas.”⁶⁴

⁵⁴ *Id.*

⁵⁵ CRAVES, *supra* note 50, at 278.

⁵⁶ GERBER, *supra* note 53, at 32

⁵⁷ *Id.*

⁵⁸ *Id.*

⁵⁹ *Id.* at 37. The N-reactor stayed in service until 1987. Matthew L. Wald, *Plutonium Plant Quietly Shut Down*, N.Y. TIMES, July 22, 1989, § 1, at 9.

⁶⁰ GERBER, *supra* note 53, at 37.

⁶¹ MICHELE STENEHJEM GERBER, ON THE HOME FRONT: THE COLD WAR LEGACY OF THE HANFORD NUCLEAR SITE 4 (2002).

⁶² *In re Hanford Nuclear Reservation Litig.*, 292 F.3d at 1128.

⁶³ *Id.*

⁶⁴ *Id.*

In 1990, HEDR released the report, *Initial Hanford Radiation Dose Estimates*, which, for the first time, publicly disclosed that Hanford had released large quantities of radioactive and non-radioactive waste, starting in the 1940s.⁶⁵ The report triggered major litigation. Thousands of individuals filed complaints, claiming a variety of illnesses caused by Hanford's toxic emissions.⁶⁶ Beyond loss of property value, the complaints “alleged that defendants acted intentionally or negligently, and that the radioactive and other toxic emissions reached numerous off-site residents through ingestion of contaminated vegetables, meat, fish, drinking water and milk, swimming in the irradiated Columbia River, and inhalation of toxic air.”⁶⁷ Over more than fifty years of operations, the potential plaintiffs could have been hundreds of thousands of people.⁶⁸

In a “strange twist,” the damage to the area is now becoming something of a boon to the region.⁶⁹ The Hanford area’s Tri-Cities—Richland, Pasco and Kennewick—are getting gearing up for another boom, similar to those of years past.⁷⁰ In the 1940s, it was the development of nuclear bombs.⁷¹ In the 1960s, during the peak of the Cold War, it was for weapons production.⁷² And, in the 1980s and early 1990s, then-House Speaker Tom Foley, a Democrat from Spokane, funneled \$100 million into the local economy.⁷³ Again the federal government is funding a major Hanford-related project.⁷⁴ This time it is a \$4 billion vitrification project to deal with Hanford’s waste.⁷⁵

A job boom related to remediation of Hanford’s nuclear operations was hardly the legacy President Kennedy sought. Hanford’s environmental damage underscored many of the worst parts of nuclear energy. However, despite the massive Hanford clean-up project, it would be a mistake to assert that President Kennedy was wrong to pursue nuclear power.

First, in all fairness, most of the damage at Hanford was not related to waste from power production; instead, it was from “the past production of plutonium for the nation’s nuclear weapons program.”⁷⁶ Second, although nuclear power became a lightning rod for criticism from environmental groups as early as the late 1960s, in light of climate change

⁶⁵ *Id.*

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ Mike Lewis, *In Strange Twist, Hanford Cleanup Creates Latest Boom*, SEATTLE POST-INTELLIGENCER, April 19, 2002.

⁷⁰ *Id.*

⁷¹ *Id.*

⁷² *Id.*

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ *Id.*; see also CRAVES, *supra* note 50, at 278 (noting that some Hanford tank residue would be made into “glass logs” for placement in a geologic disposal).

⁷⁶ Annette Cary, *Wyden Raises Concerns over Quality Control at Hanford's Vit Plant*, TRI-CITY HERALD (Kennewick, WA), Apr. 9, 2008.

concerns, many “green advocates” are rethinking their position on nuclear power.

Most prominently, Patrick Moore, a co-founder of Greenpeace,⁷⁷ has changed his views on nuclear power and, he argues, “the rest of the environmental movement needs to update its views, too, because nuclear energy may just be the energy source that can save our planet from another possible disaster: catastrophic climate change.”⁷⁸ Mr. Moore’s support of nuclear power is a major ideological transformation.⁷⁹ He explained his transformation this way: “In the early 1970s when I helped found Greenpeace, I believed that nuclear energy was synonymous with nuclear holocaust That’s the conviction that inspired Greenpeace’s first voyage up the spectacular rocky northwest coast to protest the testing of U.S. hydrogen bombs in Alaska’s Aleutian Islands.”⁸⁰

Mr. Moore is not alone in this massive change of perspective. Other leading environmentalists, former critics of nuclear power, now support the idea, as well. Perhaps most notably, “British atmospheric scientist James Lovelock, father of the Gaia theory, believes that nuclear energy is the only way to avoid catastrophic climate change.”⁸¹ In addition, the founder of the “Whole Earth Catalog,” Stewart Brand, now argues that if the environmental movement is serious about removing fossil fuels from the energy mix, additional nuclear power plants are essential.⁸²

In support of his transformation, Mr. Moore makes the point that coal produces 36% of U.S. carbon dioxide emissions, which is almost 10% percent of the world’s such emissions.⁸³ Carbon dioxide is the primary greenhouse gas responsible for global warming.⁸⁴ In contrast, nuclear energy produces about 20% of the U.S. power supply,⁸⁵ with nearly zero greenhouse gas emissions.

⁷⁷ Greenpeace is a non-profit conservation organization with the mission to “fight to save the planet has grown more serious – the threat of global warming, destruction of ancient forests, deterioration of our oceans, and the threat of a nuclear disaster loom large.” Greenpeace USA, About Us, <http://www.greenpeace.org/usa/about>.

⁷⁸ Patrick Moore, *Going Nuclear: A Green Makes the Case*, WASH. POST, Apr. 16, 2006, at B01. Mr. Moore’s support of nuclear power is a major ideological transformation. *Id.* (“In the early 1970s when I helped found Greenpeace, I believed that nuclear energy was synonymous with nuclear holocaust That’s the conviction that inspired Greenpeace’s first voyage up the spectacular rocky northwest coast to protest the testing of U.S. hydrogen bombs in Alaska’s Aleutian Islands.”). Moore notes that other leading environmentalists, former critics of nuclear power, now support the idea, as well. *Id.* (“British atmospheric scientist James Lovelock, father of the Gaia theory, believes that nuclear energy is the only way to avoid catastrophic climate change. Stewart Brand, founder of the ‘Whole Earth Catalog,’ says the environmental movement must embrace nuclear energy to wean ourselves from fossil fuels.”).

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ *Id.*

⁸² *See id.*

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ *Id.*

There remain many hurdles to overcome—in particular, cost, safety, waste, and proliferation—before additional nuclear power would be feasible.⁸⁶ But, as a 2003 MIT study put it, “[T]he nuclear option should be retained precisely because it is an important carbon-free source of power.”⁸⁷ As such, despite intervening decades of (at least U.S.) skepticism about nuclear power, climate change concerns have rekindled President Kennedy’s vision that nuclear power should have a role in the “other part of conservation . . . to use science and technology to achieve significant breakthroughs.”⁸⁸

B. Promoting Conservation While Expanding Infrastructure for Coal and Electricity: A Delicate Balance or a Practical Impossibility?

Despite his firm belief in conservation, President Kennedy also supported the use of coal for energy. This, too, indicated his pragmatic view relative to energy and the environment. He understood the need for additional (and economic) fuel sources to power the economy and raise the quality of level in many parts of the country.

Specifically, during the 1960 presidential campaign, then-Senator Kennedy promoted coal for electricity, a concept he called “coal by wire.”⁸⁹ He noted that, between 1948 and 1960, coal employment had declined from 127,000 employees to less than 50,000.⁹⁰ In a telling statement of the times, he stated without equivocation: “Our experts tell us that coal consumption can be doubled and tripled within the next twenty years – but this is a challenge, not a guarantee.”⁹¹ Today, statements about coal are often tied to the need to reduce traditional coal plants and increase “clean coal” technologies. It would be rare indeed to hear of even coal advocates arguing for increased coal use without touting an ability to reduce emissions.

The “ancient power of coal,” he stated, “burned at the mines and transmitted over huge cables—can re-enter homes in the most modern of forms—as electric power.”⁹² In this manner, he proposed to bring coal back into the home, “not by trucks and a shovel, but by wires and a switch.”⁹³ Although by no means on his own, this goal has certainly been realized. Recently, even with more utilities shifting away from coal, more than 50% of all U.S. electricity still comes from coal-fired plants today.⁹⁴

⁸⁶ STEPHEN ANSOLABEHRE, ET. AL., THE FUTURE OF NUCLEAR POWER: AN INTERDISCIPLINARY MIT STUDY, at ix (2003), available at <http://web.mit.edu/nuclearpower/pdf/nuclearpower-full.pdf>.

⁸⁷ *Id.* at 2.

⁸⁸ John F. Kennedy, Remarks, *Remarks at the Electric Generating Plant*, (Hanford, WA, Sept. 26, 1963).

⁸⁹ John. F. Kennedy, Remarks of Senator John F. Kennedy at Morgantown, West Virginia, Apr. 18, 1960.

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² *Id.*

⁹³ *Id.*

⁹⁴ Paul Davidson, *Utilities Shrink the Role of Coal*, USA TODAY, Sept. 22, 2008, at 4B.

1. Coal Slurry Pipelines: Attempting to Balance Environmental Concerns with Economic Development

President Kennedy recognized the need for energy throughout the country, and coal slurry pipelines were one way he saw to ensure progress.

We look forward to the day when energy will flow where it's needed. We cannot permit the railroads to prevent coal slurry pipelines from conveying the resources of our mines. We cannot permit the mining industry to say there shall be no nuclear energy because it may affect them negatively.⁹⁵

Once he was in the White House, President Kennedy continued his support for coal, at the same time he was promoting increased conservation efforts.⁹⁶ In that era, there was nothing incongruous about advocating for conservation and increased coal use at the same time.⁹⁷ In a special message to Congress on conservation, President Kennedy, in addition to discussing the need to address water pollution and promote land conservation, he also promoted the use of coal slurries (a coal and water mixture) to produce electricity.⁹⁸ In support of coal for electricity, he announced a proposal to develop coal slurry pipelines, similar to those used for oil, to facilitate interstate transportation.⁹⁹

Coal slurry pipelines are still in existence today.¹⁰⁰ From an environmentalist's perspective, these pipelines are particularly unappealing. First, they move coal for use in generating plants, which leads to significant emissions of greenhouse gases and other toxic pollutants.¹⁰¹ Second, slurry pipelines use a tremendous amount of water.¹⁰²

Large coal power plants use a hundreds of tons of coal each day, with corresponding water needs for a slurry pipeline. This is an especially sensitive issue for

⁹⁵ John F. Kennedy, Remarks at the Dedication of the Oahe Dam, Pierre, South Dakota, (Aug. 17, 1962).

⁹⁶ John F. Kennedy, Special Message to the Congress (Mar. 1, 1962).

⁹⁷ *See id.*

⁹⁸ *Id.*

⁹⁹ *Id.*

¹⁰⁰ Originally, these pipelines moved the coal slurry using about equal parts coal and water. *See* W. SHEPHERD & D.W. SHEPHERD, ENERGY STUDIES 112 (2003). Newer pipelines can move coal that has been compressed into logs. OFFICE OF INDUS. TECH., U.S. DEP'T OF ENERGY, COAL LOG FUEL PIPELINE TRANSPORTATION SYSTEM 1 (1999), available at <http://www.nrel.gov/docs/fy00osti/26740.pdf> (last visited Aug. 28, 2009). Coal log pipelines save about 70% water as compared to traditional slurry pipelines. *Id.*

¹⁰¹ *See* THE INTERNATIONAL HANDBOOK ON ENVIRONMENTAL TECHNOLOGY MANAGEMENT 204, tbl. 12.1 (Dora Marinova, et al., eds., 2008).

¹⁰² WILLIAM ASHWORTH, THE LATE, GREAT LAKES: AN ENVIRONMENTAL HISTORY 214-15 (1987) ("A coal slurry pipeline moves coal by crushing it to a fine powder, mixing it with large amounts of water, and pumping the water with its suspended coal particles through large-diameter pipes.").

pipelines in areas with scarce water resources. As an example, one of President Kennedy's two proposed coal slurry pipelines was the Black Mesa Mine, which shipped coal slurry 273 miles from a Northern Arizona mine (in the middle of the Hopi and Navajo reservations) to the Mohave Generating Station near Laughlin, Nevada.¹⁰³ The pipeline was the world's longest water-slurry pipeline and moved five million tons of pulverized coal per year to the 1,580-megawatt electric power plant.¹⁰⁴ To run the pipeline, Peabody (the original owner) began pumping 4,000 acre-feet per year of drinking water a year from the aquifer under Black Mesa.¹⁰⁵ Crushed coal was mixed with the water and injected into the slurry pipeline.¹⁰⁶

In 2006, rather than invest \$1 billion to clean up the power plant's emissions, operations of the plant were suspended.¹⁰⁷ The plant was expected to be off-line for at least four years, the amount of time expected that would be needed to resolve conflicts over the plant's emissions "and to negotiate with two native tribes over rights to the water needed to deliver fuel to Mohave as a slurry."¹⁰⁸ Efforts to reopen the plant have stalled, and there is no indication the plant, or the pipeline, will ever resume operations.¹⁰⁹

2. The Continuous, and Lasting, Need for Infrastructure

President Kennedy's time was not so different from our own in terms of a vast need for energy infrastructure. In addition to nuclear power and coal slurry lines, there was a continuing need for electricity infrastructure.

President Kennedy often touted the success of the Rural Electrification Act (REA),¹¹⁰ provided the long-term financing and technical expertise needed to expand the availability of electricity to rural customers.¹¹¹ President Kennedy's prepared remarks

¹⁰³ ROBERT JEROME GLENNON, WATER FOLLIES: GROUNDWATER PUMPING AND THE FATE OF AMERICA'S FRESH WATERS 155 (2004).

¹⁰⁴ John Dougherty, Wisdom of the Ancestors, PHOENIX NEW TIMES, Dec. 1, 2005 (modification in original), available at <http://www.phoenixnewtimes.com/2005-12-01/news/wisdom-of-the-ancestors>.

¹⁰⁵ *Id.*

¹⁰⁶ *Id.*

¹⁰⁷ See *Environmental Quandary Shuts Mohave Plant*, POWER MAGAZINE, Mar. 15, 2006, available at http://www.powermag.com/environmental/Environmental-quandary-shuts-Mohave-plant_544.html (reporting that, according to the plant's utility, "new emissions-control systems and burners needed to comply with the consent decree, as well as a new coal/water supply and delivery system, might cost as much as \$1.1 billion to buy and install").

¹⁰⁸ *See id.*

¹⁰⁹ S. Cal. Edison, Power Generation: Mohave Generation Station, <http://www.sce.com/PowerandEnvironment/PowerGeneration/MohaveGenerationStation/> (last visited Aug. 28, 2009) (stating that plans to restart the plant stopped in February 2007)

¹¹⁰ Rural Electrification Act, 49 Stat. 1363 (1936).

¹¹¹ President John F. Kennedy, Planned Remarks for Delivery at the University of North Dakota (Sept. 25, 1963). [hereinafter, Planned Speech].

for a September 1963 speech at the University of North Dakota stated that, since the REA passed in 1936, more than 900 cooperative rural electrification systems had been built with the assistance of federal financing.¹¹²

The REA's financial undertaking was enormous. "More than \$5 billion has been advanced to 1,000 borrowers. Over 1,500,000 miles of power lines—enough to criss-cross the nation 500 times—have been built, serving 20 million American people."¹¹³ The investment, President Kennedy noted, was remarkably sound: "Out of roughly 1,000 borrowers, only one is delinquent in payment; and the total losses on the \$5 billion advanced are less than \$50,000."¹¹⁴ This low level of default is especially striking in today's financial times.

Few investors were willing to invest in the rural electrification project without federal financing, yet few private businesses could cite such a successful record.¹¹⁵ In 1963, North Dakota-based, REA-funded cooperatives served on average around one metered farm per mile of line, compared to the average urban-area utility system of 33 electric meters per mile of line.¹¹⁶ North Dakota, at a remarkable 97%, was the state with the highest percentage of people being served by REA-funded utilities.¹¹⁷

In addition to the financing issues, President Kennedy argued that the REA raised the standard of living, strengthened the U.S. economy, and even improved national security by providing the power necessary to increase industrial activity when needed.¹¹⁸ In the State of North Dakota, the President noted in his address, prior to the REA, 3% of farms were powered by electricity; by 1963, nearly every farm in the state had power.¹¹⁹ "What was 30 years ago a life of affluence, in a sense today is a life of poverty."¹²⁰

President Kennedy recognized, though, that despite the success of the REA, the task of rural electrification was not complete.¹²¹ The President sought continuation of the

¹¹² *Id.*

¹¹³ *Id.*

¹¹⁴ *Id.*

¹¹⁵ *Id.* ("How many other investors and lenders can cite a comparable record? Yet all this has been accomplished by cooperatives working in areas that were regarded, at least at the outset, as hazardous to private industry.")

¹¹⁶ *Id.*

¹¹⁷ *Id.* Rural electric coops account for 45% of North Dakota's retail electric sales. Cooperative Facts, North Dakota Association of Rural Electric Cooperatives, <http://www.ndarec.com/electricNetworkFacts.htm>. There are currently seventeen distribution co-ops and five Generation and Transmission co-ops in the state of North Dakota. About Us, North Dakota Association of Rural Electric Cooperatives, <http://www.ndarec.com/aboutUs.htm>.

¹¹⁸ Planned Speech, *supra* note 111.

¹¹⁹ President John F. Kennedy, Remarks Delivered at the University of North Dakota (Sept. 25, 1963).

¹²⁰ *Id.*

¹²¹ Planned Speech, *supra* note 111.

REA to ensure that rural residents had access to power at competitive costs.¹²² Today, continued construction is necessary, but this time the need is not related to demand.¹²³ U.S. energy infrastructure has not kept up with the increasing needs of a growing population that uses more per capita power than ever before.¹²⁴ Construction of energy infrastructure continued through the 1960s, but investment in electric transmission lines (the high-voltage lines moving wholesale electric energy), declined (in real dollars) for the twenty-three consecutive years between 1975 and 1998.¹²⁵ Since 1998, investment has slowly increased, but is still below 1975 levels.¹²⁶ In 2004, this failure of infrastructure investment translated into a 0.6% increase in circuit miles on the U.S. interstate transmission system.¹²⁷

The capital needed to improve the U.S. energy infrastructure investment remains significant. Estimates from \$56 billion to \$100 billion, are not uncommon, and others have argued that as much as \$450 billion is needed to appropriately address electricity infrastructure needs.¹²⁸ And these investment estimates do not account for all of the additional investments that would be needed to address climate change concerns.

II. Conclusion

The need for a coherent and comprehensive energy and environmental policy is one of the most important issues facing our nation today. Energy and environmental issues impact broad and diverse areas of concern, including national security, public health and safety, economic growth, and climate change. Most of President Kennedy's programs have advanced to the point that little could (or should) be implemented today, from a tactical perspective. However, from a strategic perspective, his bold and expansive vision should still serve as a model for modern policymakers.

¹²² *Id.*

¹²³ See Joshua P. Fershee, *Misguided Energy: Why Recent Legislative, Regulatory, and Market Initiatives are Insufficient to Improve the U.S. Energy Infrastructure*, 44 HARV. J. ON LEGIS. 327, 329 (2007).

¹²⁴ See *id.*

¹²⁵ Press Release, Fed. Energy Regulatory Comm'n ("FERC" or "Commission"), Commission Proposes Transmission Pricing Reforms to Increase Power Grid Investment (Nov. 17, 2005) [hereinafter Transmission Pricing Release], available at <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=10882511> (last visited Aug. 28, 2009).

¹²⁶ *Id.* at 1. ("Over that same period, electricity demand has more than doubled, resulting in a significant decrease in transmission capacity relative to demand in every North American electric reliability region.")

¹²⁷ Joseph T. Kelliher, Chairman Kelliher on Transmission Pricing Proposed Rules (Docket No. RM06-4-000) (Nov. 17, 2005), available at <http://www.ferc.gov/news/statements-speeches/kelliher/2005/11-17-05-kelliher-pricing.pdf> (last visited Aug. 28, 2009).

¹²⁸ UNION OF CONCERNED SCIENTISTS, LESSONS FROM THE AUGUST 2003 BLACKOUT (Aug. 10, 2005), http://www.ucsusa.org/clean_energy/technology_and_impacts/impacts/lessons-from-the-august-2003.html (last visited Aug. 28, 2009).

President Kennedy was willing to take on multiple industries and make clear that the government would support and facilitate projects that were in the best interests of the country, not particular constituencies. Although, especially in practice, this characterization may be bit idealized, his concept was nonetheless clear. Modern politicians would be well-served to follow President Kennedy's admonition:

From the beginning of civilization, every nation's basic wealth and progress has stemmed in large measure from its natural resources. This nation has been, and is now, especially fortunate in the blessings we have inherited. Our entire society rests upon—and is dependent upon—our water, our land, our forests, and our minerals. How we use these resources influences our health, security, economy, and well-being.

-- President John. F. Kennedy, Feb. 23, 1961¹²⁹

¹²⁹ John F. Kennedy, Special Message, *Special Message to the Congress on Natural Resources* (Feb. 23, 1961).