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From Trash to Treasure: Converting America's Contaminated Land into Renewable Energy Havens

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ABSTRACT

How is it possible to turn brown to green? Think back to elementary school when you learned about the color wheel, and with great determination, you would mix colors together to get the exact hue needed for your painting. It was easy to mix the wrong colors and end up with a dirty brown. Once your palette was dirtied, it was nearly impossible to return to the brilliant colors with which you started and get a second shot at getting it right.

Unfortunately, as adults, we continue to make the same errors in the world around us. Often with the best of intentions, but through lack of education or ineffective controls, we contaminate the natural environment that surrounds our communities. So how do we turn that dirtied environment back into a treasure? Primarily, we use site remediation and revitalization in an attempt to reverse course and return contaminated land to a safe and usable state. Additionally, in recent years, the EPA launched its *RE-Powering America's Land: Siting Renewable Energy on Potentially Contaminated Land and Mine Sites Initiative* (*RE-Powering Initiative*) in an effort to foster development of reuse opportunities on the remediated properties, including the siting of renewable energy projects.

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This Article explores that second chance to get it right this time and to expand renewable energy project development in an even more meaningful way. In the following pages, the author examines the emerging trend of siting renewable energy projects on contaminated land. Part I briefly introduces the reader to some of the rationales for developing clean energy, and specifically discusses the growing trend of renewable energy projects. Part II explores the concept of siting some of these projects on contaminated land instead of in greenspaces. The author discusses the EPA's *RE-Powering Initiative* and its recommended approach to incorporating renewable energy projects into the remediation and reuse plans for contaminated property.

Part III addresses several challenges that have previously hindered siting renewable energy on such properties, but which today have been sufficiently mitigated to the extent that these properties can expand our renewable energy production. Part IV evaluates some recommendations for further facilitating renewable development on contaminated properties. Finally, Part V concludes the Article by presenting a success story, which demonstrates the success already yielded through this relatively new paradigm shift to renewing our contaminated lands and growing our nation's renewable energy portfolio.

The author hopes that as the reader progresses through this Article, the increased potential for incorporating renewable energy into the reuse plans for our nation's contaminated property is both clear and convincing. While renewable energy development is only one spoke in the wheel of energy independence, it is an important one that demands a concerted national effort and takes time to build.[1] Today is the day to convert America's limited-use land into renewable energy havens in order to promote our energy independence, green our communities, and strengthen our economy.

TABLE OF CONTENTS

1. *See generally* HEATHER ZICHAL ET AL., THE BLUEPRINT FOR A SECURE ENERGY FUTURE: PROGRESS REPORT (2012), *available at* http://www.whitehouse.gov/sites/default/files/email-files/the_blueprint_for_a_secure_energy_future_oneyear_progress_report.pdf. Renewable energy project development is only a single part of America realizing energy independence and reducing our global carbon footprint. Other aspects include: improving our national energy efficiency, modernizing our electrification infrastructure, growing our public transportation infrastructure, reducing foreign oil imports, expanding domestic production of oil and natural gas, investing in domestic nuclear growth and clean coal technology, and other critical focus areas.

I. INTRODUCTION

A. Background

The National Oceanic and Atmospheric Administration (NOAA) recently reported data confirming the dangers that scientists have been cautioning society about for several years.[2] NOAA reported that in 2012, the contiguous United States saw the most extreme weather in 100 years and the third-hottest summer on record.[3] NOAA's National Climatic Data Center reported that in 2012, the United States experienced the "largest moderate to extreme drought area (based on the Palmer Drought Index) since the 1950s," and in 2011, the United States experienced a record fourteen extreme weather events.[4]

A recent survey examined over 12,000 peer-reviewed climate science papers and concluded that "[q]uite possibly the most important thing to communicate about climate change is that there is a 97% consensus amongst the scientific experts and scientific research that humans are causing global warming."[5] Regardless of the extent to which the reader believes U.S. energy generation and energy and fuel consumption contribute to our global carbon footprint, most can agree that we need to endeavor to be more environmentally responsible in our energy generation and more efficient in our use of fuel and electricity. While domestic fossil-fuel production is increasing and oil imports are at a sixteen-year low, in 2011, the United States still spent $371 billion on foreign oil—money gone abroad instead of remaining at home to strengthen our economy through reinvestment and spending cycles.[6] Of late, crude oil prices, and natural gas prices in particular, remain volatile.[7] The country is

2. *See The American Energy Initiative: A Focus on the Outlook for Achieving North American Energy Independence within the Decade Before the Subcomm. on Energy & Power of the H. Comm. on Energy & Commerce*, 112th Cong. 93 (2012) (testimony of Daniel J. Weiss, Senior Fellow, Center for American Progress Action Fund) [hereinafter *Weiss Testimony*].

3. *See id.* (citing NOAA'S U.S. Climate Extremes Index); *see also* Nat'l Climatic Data Ctr., *U.S. Climate Extremes Index (CEI)*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., http://www.ncdc.noaa.gov/extremes/cei/graph/cei/ytd (last visited Jan. 24, 2014).

4. Nat'l Climatic Data Ctr., *Drought—July 2012*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., http://www.ncdc.noaa.gov/sotc/drought/2012/7 (last visited Jan. 24, 2014); *see* Nat'l Climatic Data Ctr., *Billion-Dollar Weather/Climate Disasters*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., http://www.ncdc.noaa.gov/billions (last visited Jan. 24, 2014).

5. Dana Nuccitelli, *Survey Finds 97% of Climate Science Papers Agree Warming Is Man-Made*, THE GUARDIAN, May 16, 2013, http://www.guardian.co.uk/environment/climate-consensus-97-per-cent/2013/may/16/climate-change-scienceofclimatechange; *see* John Cook et al., *Quantifying the Consensus on Anthropogenic Global Warming in the Scientific Literature*, ENVTL. RES. LETTERS 8 (2013), *available at* http://iopscience.iop.org/1748-9326/8/2/024024/pdf/1748-9326_8_2_024024.pdf.

6. *See Weiss Testimony*, *supra* note 2, at 97; Press Release, Office of the Press Sec'y, The White House, *Remarks by the President in State of the Union Address* (Jan. 24, 2012), http://www.whitehouse.gov/the-press-office/2012/01/24/remarks-president-state-union-address [hereinafter *2012 State of the Union*] (discussing "all-of-the-above" clean energy strategy, which includes reducing foreign fossil-fuel imports while United States increases fossil-fuel-based energy production).

7. *See* SOFYA ALTERMAN, OXFORD INST. FOR ENERGY STUD., NATURAL GAS PRICE VOLATILITY IN THE

struggling to recover from the worst economic downturn since the Great Depression and many family breadwinners remain out of work.[8] These are real world, tangible examples of how climate change and fossil-fuel dependence are impacting us right here in the United States—our environment, our economy, and our way of life.

President Barack Obama stated in his 2012 State of the Union Address, "with only 2 percent of the world's oil reserves, oil isn't enough. This country needs an all-out, all-of-the-above strategy that develops every available source of American energy. A strategy that's cleaner, cheaper, and full of new jobs."[9] He called for more natural-gas exploration, enough renewable energy development to compete on a global scale, clean-energy standards that promote economic growth and energy innovation, and double the efforts focusing on energy efficiency.[10]

All of this is to say that we, as Americans, need to take more action to achieve our national goals to reduce our carbon footprint, diversify our energy base, strengthen our economy, and achieve energy independence. With all of these motivations for development and national goals to attain, let us look at U.S. efforts to develop a strong clean-energy industry, and, in particular, a renewable energy industry.

B. Renewable Energy in General

In 2012, the United States invested $48 billion in clean energy and now has the opportunity to engage in the competition over a $2 trillion, global clean-energy market.[11] Current renewable-energy-sourced electricity generation is on the rise as "[r]enewable electricity represented nearly 13% of total installed capacity and more than 12% of total electric generation in the United States in 2011," and "accounted for more than 35% of all new electrical capacity installation in the United States."[12] Additionally, "[i]n 2011, cumulative installed wind capacity increased by nearly 17% and cumulative installed solar photovoltaic capacity grew more than 86% from the previous year."[13]

A 2012 U.S. Energy Information Administration report stated that "[o]f the major renewable fuel categories, biomass accounted for over half (53 percent)

UK AND NORTH AMERICA 4-5 (Feb. 2012), *available at* http://www.oxfordenergy.org/wpcms/wp-content/uploads/2012/02/NG_60.pdf.

8. *See* Nelson D. Schwartz, *Jobs Data Eases Fears of Economic Slowdown in U.S.,* N.Y. TIMES, May 3, 2012, http://www.nytimes.com/2013/05/04/business/economy/us-adds-165000-jobs-in-april.html?pagewanted=all&_r=0.

9. *2012 State of the Union*, *supra* note 6.

10. *See id.*

11. *See Weiss Testimony*, *supra* note 2, at 99.

12. RACHEL GELMAN, OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, U.S. DEP'T OF ENERGY, 2011 RENEWABLE ENERGY DATA BOOK 3-4 (Feb. 2013), *available at* http://www.nrel.gov/docs/fy13osti/54909.pdf.

13. *Id.* at 3.

of total renewable energy consumption in 2010, while hydroelectric power accounted for nearly a third (31 percent). Wind was the source of 11 percent of total renewable energy consumption, and solar and geothermal combined contributed 5 percent."[14] In short, recent trends in renewable energy development and consumption demonstrate short-term successes.

The Department of Energy's (DOE) *20% Wind Energy by 2030* report indicated that 40% of total greenhouse gas (GHG) emissions come from power-generation facilities, but if domestic investment reaches 20% wind electricity by 2030, then the amount of carbon dioxide emissions could be reduced by 825 million metric tons annually, or approximately 25% of a no-new-wind scenario.[15] This same investment could reduce natural-gas consumption for utilities by 50%, reduce natural-gas consumption by 11% across industry, and reduce coal use by 18% across industry.[16] Additionally, it simultaneously saves domestic fossil fuel for distribution across time, moves the United States closer to energy independence, and cleans our environment. The report also found that by 2030, this wind expansion could support up to 500,000 jobs in the wind industry, support more than 150,000 jobs in associated support industries, yield 200,000 jobs through economic expansion, increase annual property tax revenues by more than $1.5 billion, and increase annual payments to rural landowners to more than $600 million.[17]

The solar industry is also an engine for economic growth, technological innovation, and energy independence.[18] In 2012, the solar industry grew to over 119,000 solar workers in 5600 businesses spread across every state in the country.[19] The value of solar electric installations increased from $6 billion in

14. *Trends in Renewable Energy Consumption and Electricity*, U.S. ENERGY INFO. ADMIN. (Dec. 11, 2012), http://www.eia.gov/renewable/annual/trends.

15. *See* U.S. DEP'T OF ENERGY, 20% WIND ENERGY BY 2030: INCREASING WIND ENERGY'S CONTRIBUTION TO U.S. ELECTRICITY SUPPLY 14 (2008), *available at* http://www.nrel.gov/docs/fy08osti/41869.pdf.

16. *See id.* at 154.

17. *See About*, GOVERNORS' WIND ENERGY COALITION, http://www.governorswindenergycoalition.org/?page_id=73 (last visited Jan. 24, 2014); *see also* GOVERNORS' WIND ENERGY COALITION, RENEWABLE ELECTRICITY STANDARDS: STATE SUCCESS STORIES 13 (2013) [hereinafter RES WHITE PAPER], *available at* http://www.governorswindenergycoalition.org/wp-content/uploads/2013/03/RES-White-Paper-March-2013.pdf (describing National Renewable Energy Laboratory study of new wind-component facilities opened in 2011); U.S. DEP'T OF ENERGY, *supra* note 15. The wind facilities will likely require high-skill labor. *See* RES WHITE PAPER, *supra*, at 13.

18. *See generally* SOLAR ENERGY INDUSTRIES ASS'N, SOLAR ENERGY FACTS: 2012 YEAR-IN-REVIEW (Mar. 14, 2013), *available at* http://assets.fiercemarkets.com/public/sites/energy/reports/seiasolarreview.pdf; *MidAmerican Solar and SunPower Start Major Construction on World's Largest Solar Power Development*, FIERCEENERGY (Apr. 26, 2013), http://www.fierceenergy.com/press-releases/midamerican-solar-and-sunpower-start-major-construction-worlds-largest-sola (discussing California project that will employ approximately 650 workers throughout three-year construction project, generate over $500 million in regional economic value, and produce enough energy to power approximately 400,000 American homes).

19. *See* SOLAR ENERGY INDUSTRIES ASS'N, *supra* note 18, at 2.

2010 to $8.6 billion in 2011, and to $11.5 billion in 2012.[20] With technological innovation leading to better quality and lower cost solar components, the average price of solar panels and completed photovoltaic systems continues to drop.[21] The over 7700 megawatts (MW) of installed solar electric capacity through 2012 (enough to power more than 1.2 million American households)—which includes an increase of 26% of commercial market installation over 2011—demonstrates solar's strong contribution to future energy independence.[22] Less capital investment in photovoltaic solar occurred in 2013 as compared to 2012 because of the explosion in market growth over the last several years, which resulted in an energy surplus and a lower project cost basis. But experts anticipate a recovery in capital investment again in 2014.[23]

While President Obama has not necessarily committed to a federal renewable portfolio standard (RPS), he made clean energy a centerpiece of his energy strategy.[24] His goal is to "double the share of electricity from clean energy sources to 80 percent by 2035 from a wide variety of clean energy sources, including renewable energy sources like wind, solar, biomass, and hydropower; nuclear power; efficient natural gas; and coal with carbon capture utilization and sequestration."[25] To that end, another recent study shows taxpayer commitment to personal investment, reporting that "the average American is willing to pay about 13 percent more or an average of about $162 (95 percent confidence range is $128-$260) per year in higher electricity bills to reach the 80 percent goal."[26]

Furthermore, another recent survey indicated that 62% of energy executives "believe the U.S. can achieve energy independence by 2030, and 23 percent believe the U.S. can be energy independent by 2020."[27] While survey participants noted that "environmentally-friendly" technology development

20. *See id.*

21. *See id.* at 1.

22. *See id.*

23. Barbara Vergetis Lundin, *The Worst Could Be Over for the Solar Industry*, FIERCEENERGY (May 22, 2013), http://www.fierceenergy.com/story/worst-could-be-over-solar-industry/2013-05-22?utm_medium=nl&utm_source=internal (discussing reduced solar photovoltaic capital investment and spending in 2013 due to surplus of solar energy—down from $3.6 billion in 2012 to $2.3 billion in 2013—could be bottom as industry projected to rebound in 2014).

24. *See* ZICHAL ET AL., *supra* note 1, at 1.

25. *Id.* at 11.

26. Bill Chameides, *Is There a Clean Energy Standard in Our Future?*, HUFFINGTON POST (May 17, 2012, 5:01 PM), http://www.huffingtonpost.com/bill-chameides/is-there-a-clean-energy-s_b_1525624.html (citing Joseph E. Aldy et al., *Willingness To Pay and Political Support for a US National Clean Energy Standard*, 2 NATURE CLIMATE CHANGE 596 (2012), *available at* http://www.nature.com/nclimate/journal/v2/n8/abs/nclimate1527.html)).

27. *Survey: Industry Optimistic on U.S. Reaching Energy Independence*, ELECTRIC LIGHT & POWER (May 17, 2013), http://www.elp.com/articles/2013/05/survey--industry-optimistic-on-u-s--reaching-energy-independence.html.

should focus primarily on natural gas (79%) and nuclear (39%), 33% of respondents also identified solar as a priority.[28] Respondents indicated that further focus on project financing and transmission capacity would help overcome limitations on additional renewable energy project development.[29]

Considering our nation's current posture on clean energy—from the President to energy executives, scientists, developers, investors, and consumers—now is the time to capitalize on that commitment and continue moving forward with renewable energy project development. While other articles address renewable energy siting in general, this Article is narrower in scope and will focus primarily on siting renewable energy projects on contaminated land. Thus, the remainder of this Article will discuss the EPA's flagship *RE-Powering Initiative* that was chartered specifically to facilitate such development, five specific historical challenges that have been significantly mitigated in recent years, two recommendations to improve such siting, and one of the many success stories thus far achieved.

II. *RE-POWERING INITIATIVE* (SEPTEMBER 2008)

A. Contaminated Land

While there are a number of different types of blighted or limited-use parcels of land that could be discussed in this Article, the author will focus primarily on the three targeted site types highlighted by the *RE-Powering Initiative*: CERCLA Superfund sites; Brownfields; and Corrective Action (CA) sites regulated under the Resource Conservation and Recovery Act of 1976 (RCRA).[30] In preparation for that discussion, we will take a moment to establish a common understanding of what constitutes a CERCLA Superfund site, a Brownfield, and a RCRA CA site. While all three of these sites may contain parcels of land, which are not contaminated, are potentially contaminated, or have already been investigated and are definitely contaminated, for purposes of brevity in this Article, the author will typically only refer to them as contaminated. Of note, pre- and post-closure landfills constitute another large collection of properties ripe for renewable project-siting. The *RE-Powering Initiative* also places emphasis on the potential development of solar projects on municipal solid waste landfills; however, this Article will not delve into landfills as they are a slightly different type of contaminated property, which pose their own unique challenges.[31]

28. *See id.*

29. *See id*.

30. *See* Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, Pub. L. No. 96-510, 94 Stat. 2767 (codified as amended at 42 U.S.C. §§ 9601-9657 (2012)); Resource Conservation and Recovery Act (RCRA) of 1976, Pub. L. No. 94-580, 90 Stat. 2795 (codified as amended at 42 U.S.C. §§ 6901-6992k (2012)).

31. *See generally* U.S. ENVTL. PROT. AGENCY & NAT'L RENEWABLE ENERGY LAB., BEST PRACTICES FOR

1. CERCLA Remediation Sites or Superfund Sites

CERCLA Remediation sites[32]—or Superfund sites[33] as they are colloquially referred to—are abandoned hazardous waste sites where there is a substantial risk to human health.[34] Even when the owner or operator source or sources are identified, the parties are often bankrupt. Cleanup at these sites is distinguishable from RCRA CA sites because generally the EPA has lead cleanup and funding responsibility for the cleanup at Superfund sites, whereas the facility owner or operator is generally financially liable and actively involved in cleanup at RCRA CA sites. The EPA's Superfund Program ensures long-term protection of human health and environmental protectiveness by: assessing allegedly abandoned or limited-use hazardous waste release sites; placing long-term cleanup sites on the National Priorities List (NPL); establishing, implementing, and monitoring cleanups; enforcing the law against potentially responsible parties (PRPs); collecting on reimbursements for EPA-led and funded cleanups; and developing partnerships with state and local governments, community groups, developers, and capital investors.[35]

The Superfund Program, via CERCLA, exercises its authority to respond to a potentially contaminated site through either a removal action[36] or a remedial action.[37] For purposes of this Article, the author focuses on remedial action sites where the cleanup process is a long-term endeavor to remedy the release of more persistent contamination.

Supporting the actual enforcement and remediation efforts of the Superfund Program is the EPA's Office of Superfund Remediation and Technology Innovation (OSRTI).[38] The OSTRI works with all relevant stakeholders

SITING SOLAR PHOTOVOLTAICS ON MUNICIPAL SOLID WASTE LANDFILLS (Feb. 2013) [hereinafter BEST PRACTICES], *available at* http://www.epa.gov/renewableenergyland/docs/best_practices_siting_solar_photovoltaic_final.pdf.

32. Congress amended CERCLA in 1986. *See* Superfund Amendments and Reauthorization Act (SARA) of 1986, Pub. L. No. 99-499, 100 Stat. 1613. Congress further amended CERCLA in 2002. *See* Small Business Liability Relief and Brownfields Revitalization Act, Pub. L. No. 107-118, 115 Stat. 2356 (2002) (codified as amended in scattered sections of 42 U.S.C.).

33. *See Superfund: Basic Information,* U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/superfund/about.htm (last visited Jan. 24, 2014) ("Superfund is the name given to the environmental program established to address abandoned hazardous waste sites. It is also the name of the fund established by [CERCLA]. . . .").

34. *See id.*; *see also CERCLA Overview*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/superfund/policy/cercla.htm (last visited Jan. 24, 2014) (providing brief overview of CERCLA); *SARA Overview*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/superfund/policy/sara.htm (last visited Jan. 24, 2014) (discussing SARA amendments to CERCLA, which incorporated lessons learned from EPA's first six years of CERCLA management).

35. *See CERCLA Overview*, *supra* note 34; *Sara Overview, supra* note 34.

36. *See* 42 U.S.C. § 9601(23) (2012) (defining "removal actions" as short-term or emergency response actions where recent release or threat of release of hazardous substances).

37. *See id.* § 9601(24) (defining "remedial action").

38. *See Office of Superfund Remediation and Technology Innovation*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/superfund/partners/osrti (last visited Jan. 24, 2014).

involved in the cleanup-and-reuse planning process to assist in returning the property to ecologically sound states for reuse.

2. Brownfields[39]

A Brownfield site is defined as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant."[40] Notably, Brownfield sites do not include facilities listed, or proposed for listing, on the NPL (i.e., Superfund sites), or facilities which are subject to RCRA CA.[41] States, through their voluntary cleanup programs (VCPs) and VCP memorandums of agreement with the EPA, often exercise lead responsibility for overseeing cleanup at Brownfield sites and working with relevant stakeholders.[42]

"Cleaning up and reinvesting in these properties protects the environment, reduces blight, and takes development pressures off greenspaces and working lands," which is especially important for surrounding communities, as many of these sites are in close proximity to urban areas.[43] Since the inception of the EPA's Brownfields Program in 1995 and the additional tools and grant money made available through the Brownfields Law in 2002, the EPA has leveraged more than $14 billion of grant money and launched a number of projects to conduct site assessments, site cleanups, and job training.[44] The EPA estimates that there are as many as 450,000 Brownfields across the country.[45]

39. *See generally* Small Business Liability Relief and Brownfields Revitalization Act, Pub. L. No. 107-118, 115 Stat. 2356 (2002) (codified as amended in scattered sections of 42 U.S.C.). The Small Business Liability Relief and Brownfields Revitalization Act is commonly referred to as the "Brownfields Law." *See Brownfields and Land Revitalization*, *Laws and Statutes,* U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/brownfields/laws (last visited Jan. 24, 2014) (discussing how Brownfields Amendments provided "funds to assess and clean up [B]rownfields; clarified CERCLA liability protections; and provided funds to enhance state and tribal response programs").

40. 42 U.S.C. § 9601(39); *see Brownfields and Land Revitalization*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/brownfields (last visited Jan. 24, 2014).

41. *See* 42 U.S.C. § 9601(39)(b)(i), (v); *see Brownfields Definition*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/brownfields/overview/glossary.htm (last visited Jan. 24, 2014).

42. *See State & Tribal Response Programs Agreements*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/brownfields/state_tribal/moa_mou.htm (last visited Jan. 24, 2014).

43. *Brownfields and Land Revitalization*, *supra* note 40; *see* U.S. ENVTL. PROT. AGENCY, RCRA CORRECTION ACTION: CASE STUDIES REPORT 3 (Apr. 2013) [hereinafter RCRA CA REPORT], *available at* http://epa.gov/epawaste/hazard/correctiveaction/pdfs/RCRACorrAct.pdf (discussing approximately 66% of RCRA CA sites associated with census-defined urban areas).

44. *See Basic Information, Brownfields and Land Revitalization*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/brownfields/basic_info.htm (last visited Jan. 24, 2014).

45. *See id*.

3. RCRA CA Sites[46]

RCRA CA sites are those facilities identified by the RCRA CA program at which: a hazardous waste contaminant is suspected to have been released into the soil, groundwater, surface water, or air; a hazardous contaminant was released and the affected site was subsequently remediated; or a hazardous contaminant was released and continues to contaminate the site.[47] The EPA promulgated a number of regulatory provisions in 40 C.F.R. § 260.10, which provide general definitions of terms in the RCRA and 40 C.F.R. §§ 261.31-261.33, which define the specific hazardous wastes that trigger RCRA CA.[48] The program identified a baseline of at least 3747 facilities that require investigation or remedy.[49] These sites are generally regulated by one of the EPA's regional offices or by state-level agencies in forty-two authorized states and the Territory of Guam.[50]

With the three aforementioned categories of contaminated land generally defined, the reader is now equipped to explore the general background of the *RE-Powering Initiative*, to consider the many benefits of siting renewable energy on Superfund, Brownfield, and RCRA CA sites, and to examine the mechanics of preparing for and planning the siting of renewable energy on contaminated property.

B. RE-Powering Initiative: Background, Benefits, and Mechanics

1. Background

In 2008, the EPA established the *RE-Powering Initiative* in order to

46. In 1976, the RCRA amended the Solid Waste Disposal Act, Pub. L. No. 89-272, 79 Stat. 997 (1965). Of note, Congress amended the Act again in 1984 to address corrective action for the release of hazardous waste at RCRA-regulated facilities. *See* Hazardous and Solid Waste Amendments of 1984, Pub. L. No. 98-616, 98 Stat. 3221. The current version of the RCRA is as amended through the Protection of Family Farmers Act of 2002. *See* Pub. L. No. 107-377, 116 Stat. 3115. *See generally Corrective Action*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/waste/hazard/correctiveaction/index.htm (last visited Jan. 24, 2014).

47. *See Facility Information*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/epawaste/hazard/correctiveaction/facility/index.htm#Feds (last visited Jan. 24, 2014).

48. *See Listed Wastes*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/epawaste/hazard/wastetypes/listed.htm (last visited Jan. 24, 2014) (discussing F-list nonspecific source wastes, K-list source-specific wastes, and P- and U-list discarded commercial chemical products); *see also* RCRA CA REPORT, *supra* note 43, at 24 (providing one-page timeline and explanation of RCRA CA program from inception in 1984 through 2020 goals).

49. *See* RCRA CA REPORT, *supra* note 43, at 24. *See generally* U.S. ENVTL. PROT. AGENCY, 2020 CORRECTIVE ACTION BASELINE: 3,779 FACILITIES SORTED BY EPA REGION, STATE, COUNTY, AND CITY (Apr. 22, 2013), *available at* http://www.epa.gov/epawaste/hazard/correctiveaction/pdfs/2020scc.pdf.

50. *See Corrective Action*, *supra* note 46; *see also* OFFICE OF SITE REMEDIATION ENFORCEMENT, U.S. ENVTL. PROT. AGENCY, REVITALIZING CONTAMINATED SITES: ADDRESSING LIABILITY CONCERNS 5 (Mar. 2011) [hereinafter LIABILITY CONCERNS HANDBOOK], *available at* http://www.epa.gov/compliance/resources/publications/cleanup/brownfields/handbook/bfhbkcmp-11.pdf. In 1998, the EPA originally published a revitalization handbook, which addressed liability issues, and subsequently updated and reissued it in 2011 as the *Revitalizing Contaminated Sites: Addressing Liability Concerns*.

encourage and facilitate development of renewable energy projects on contaminated land and mine sites when such development is aligned with the community's vision for the site.[51] Shortly thereafter, the *RE-Powering Initiative* partnered with the DOE's National Renewable Energy Laboratory (NREL) in order to "develop criteria to evaluate contaminated land and mine sites across the country for wind, solar, biomass, geothermal, and landfill gas methane development potential."[52]

In the subsequent five years, the EPA and NREL have used screening criteria to evaluate more than 24,000 EPA and state-tracked contaminated land and mine sites across 22 million acres in the United States, the District of Columbia, and the U.S. Territories.[53] Over 70,000 opportunities exist as a function of favorable site and available technology combinations, which merely represents the tip of the proverbial iceberg as there are thousands of other sites tracked only at the state level that are not yet incorporated into the *RE-Powering* database.[54] However, by late 2013, the *RE-Powering Initiative* anticipated including state-tracked and regulated data for contaminated properties in five states.[55]

The *RE-Powering Initiative* and NREL partnership yielded the creation of a database of state and national renewable energy maps and the interactive Google Earth Mapping Tool.[56] The Mapping Tool is a mechanism that anyone with internet access can use to toggle through a treasure trove of information related to the potential development sites.[57] Additionally, over the last five years, the *RE-Powering Initiative* team has published a number of fact sheets, reports, studies, handbooks, and success stories to educate the public and assist

51. *See Frequently Asked Questions on Renewable Energy on Contaminated Land and Mine Sites*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/renewableenergyland/rd_faq.htm (last visited Jan. 24, 2014) [hereinafter *RE-Powering FAQs*]; *see also* CTR. FOR PROGRAM ANALYSIS, OFFICE OF SOLID WASTE & EMERGENCY RESPONSE, U.S. ENVTL. PROT. AGENCY, HANDBOOK ON SITING RENEWABLE ENERGY PROJECTS WHILE ADDRESSING ENVIRONMENTAL ISSUES 3 (2012) [hereinafter RENEWABLE ENERGY PROJECTS HANDBOOK], *available at* http://www.epa.gov/renewableenergyland/docs/handbook_siting_repowering_projects.pdf.

52. *RE-Powering FAQs*, *supra* note 51.

53. *See id.*; RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51, at 1, 3. While the EPA estimates there are approximately 500,000 Brownfields in the United States, the *RE-Powering Initiative* tracks approximately 11,000 federal sites. *See* RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51, at 1. Additional state-tracked sites in the current database increased the total EPA and state-tracked total to over 24,000 sites. *See* Adam Klinger et al., U.S. Envtl. Prot. Agency*, RE-Powering America's Land: Resources for Installing Solar Power on Contaminated Lands* 9 (May 17, 2013) (on file with author).

54. *See* Klinger et al., *supra* note 53, at 9; *see also* RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51, at 1, 3, 8 (discussing *RE-Powering Initiative* working with states in effort to incorporate state-tracked contaminated sites, mine sites, and landfills into Google Earth Mapping Tool).

55. *See* E-mail from Adam Klinger, U.S. Envtl. Prot. Agency, to author (May 21, 2013, 11:52 PM) (on file with author).

56. *See Mapping and Screening Tools*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/oswercpa/rd_mapping_tool.htm (last visited Jan. 24, 2014). This tool was last updated in August 2010.

57. *See id.*

potential renewable-energy-project stakeholders with developing contaminated and formerly contaminated sites.

One of those resources—the *Handbook on Siting Renewable Energy Projects While Addressing Environmental Issues* published by the EPA's Office of Solid Waste and Emergency Response (OSWER)—is a must-read guide for anyone interested in this topic.[58] The handbook provides a basic framework for planning how to integrate solar, wind, biomass, and geothermal renewable energy projects at the utility scale, community scale, and off-grid scale (independent generation for on-site use) into Superfund sites, Brownfields, RCRA CA sites, and landfills.[59] The handbook also includes a number of figures and charts to show some of the primary phases and decision points that the major stakeholders must account for in the partnership required to make siting renewable energy on contaminated sites a success. Later in this section, this Article will further explore some of the mechanics of the renewable energy property investigation and planning phases as recommended by the *RE-Powering Initiative*.

2. Benefits

The benefits of developing renewable energy on contaminated land are numerous and varied. Some of the benefits include: preserving greenspaces; reducing blight and improving the appearance of communities; raising property values and creating jobs; allowing for access to existing infrastructure, including electric transmission lines and roads; enabling potentially contaminated property to return to a productive and sustainable use; providing a long-term source of clean and cost-effective energy; and allocating revenue to help cover or offset cleanup costs on contaminated sites.[60] While all of these benefits are important, as well as others not listed here, there are three in particular that merit a more detailed discussion.

First, siting on contaminated land helps to preserve greenspaces or green fields on which the projects might otherwise have been sited. While this Article focuses narrowly on reuse of contaminated and remediated land for renewable project siting, there is a wealth of scholarship on renewable siting in general. One of the greatest challenges often highlighted in those articles is the community resistance and frequent litigation related to the use of pristine and healthy land for siting industrial infrastructure.

Even though windmills, solar panels, geothermal systems, and biomass facilities are displacing conventional fossil-fuel sources of electricity, there are aesthetics, noise, wildlife impacts, and other concerns that still create hurdles

58. *See generally* RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51.

59. *See id*. at 2, 7. Since publication of the handbook, the NREL has changed its terminology from "non-grid scale" to "off-grid scale." *See* E-mail from Adam Klinger, *supra* note 55.

60. *See* RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51, at 3.

for development. When citizens are properly engaged in decision-making and educated on the many benefits that can result from returning contaminated and unusable land to a useful and healthy state, they can identify that the positive returns to the community outweigh the potential drawbacks. The end state is that greenspaces remain green while brownfields are slowly regreened.

Second, renewable-energy-project siting creates jobs.[61] Both long- and short-term jobs connected to constructing, operating, and maintaining facilities are created. Because projects often last fifteen to thirty years, the jobs created are likely to be filled by local hires due to the duration of operating and maintaining the facilities. For example, one ten-MW, forty-one-acre solar project in Chicago created more than 200 local-hire construction jobs and used locally sourced materials for the project.[62] On a national level, a recent NREL study showed that the boom in renewable wind projects led to marked expansion in wind turbine and component manufacturing.[63] In 2011, the percentage of domestically sourced wind components rose to 67% from 35% in 2006.[64] Moreover, "[e]ight of the ten largest global wind turbine makers selling in the U.S. now have factories here," which added thousands of new high-skill jobs.[65] Additionally, the Superfund Redevelopment Initiative estimates that over 30,000 jobs and more than $1.3 billion in annual income for local communities resulted from reuse development at more than 300 successfully remediated properties.[66]

Third, because of previous industrial uses, contaminated land is often in close proximity to existing infrastructure, including electric transmission lines, substations, roads, and other necessary facilities.[67] "[N]ew line construction which can range from $250,000 to $3 million per mile" is often an avoidable capital cost because existing lines are already present, or if the lines need replacing, at least the towers, poles, and easements are still usable.[68] Substations, costing from $500,000 to $2.5 million to build, are also often

61. *See* U.S. ENVTL. PROT. AGENCY, RE-POWERING AMERICA'S LAND: POTENTIAL ADVANTAGES OF REUSING POTENTIALLY CONTAMINATED LAND FOR RENEWABLE ENERGY 3 (July 2012) [hereinafter EPAPOTENTIAL ADVANTAGES OF REUSING], *available at* http://www.epa.gov/renewableenergyland/docs/contaminated_land_resuse_factsheet.pdf; *see also* WARREN LEON, EVALUATING THE BENEFITS AND COSTS OF A RENEWABLE PORTFOLIO STANDARD: A GUIDE FOR STATE RPS PROGRAMS 8 (May 2012), *available at* http://www.cleanenergystates.org/assets/2012-Files/RPS/CESA-RPS-evaluation-report-final-5-22-12.pdf.

62. *See* EPA POTENTIAL ADVANTAGES OF REUSING, *supra* note 61, at 2.

63. *See* RES WHITE PAPER, *supra* note 17, at 13 (citing NREL study of new wind-component facilities opened in 2011).

64. *See id*.

65. *Id*.

66. U.S. ENVTL. PROT. AGENCY, RETURNING SOME OF THE NATION'S WORST HAZARDOUS WASTE SITES TO SAFE AND PRODUCTIVE USES 15, *available at* http://www.epa.gov/superfund/programs/recycle/pdf/reusingsites.pdf.

67. *See* EPA POTENTIAL ADVANTAGES OF REUSING, *supra* note 61, at 2.

68. *Id.*

available if existing transmission lines are accessible.[69]

Finally, rail lines, roads, and river or ocean ports are critical for transporting the initial renewable-energy-infrastructure components and any required supplies for operating the energy-generation systems once they are functional. The developer will need to bring in cranes to erect wind mills, as well as large trucks or rail cars to deliver turbines, blades, tower sections, solar panels and tracks, biomass incinerators, and geothermal pipe sections. Additionally, biomass projects require importation of massive amounts of paper mill waste, lumber mill waste, and other urban wood waste—all of which require fluid delivery mechanisms.[70] While all of this infrastructure can be present at greenspaces, often the industrial processes that contaminated the siting land required electricity and transportation infrastructure and those enablers are still available and can be leveraged immediately.

There are not many arguments against renewable energy projects on contaminated or remediated land, but one in particular merits comment. The argument is that siting renewable energy projects on contaminated or remediated sites is a breach of environmental justice.[71] The EPA's webpage on environmental justice defines the concept as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."[72]

In other words, poor or impoverished people living in the vicinity of these limited-use properties, who have already been subjected to unsafe Superfund, Brownfield, or RCRA CA properties, may have a modern form of industrialization forced upon them by the new energy plants.[73] These people must therefore be heard and have a role in decision-making with respect to the project affecting them.[74] The primary way to avoid further injustice against this particular population, or any other group of citizens, is for property owners, developers, and investors to ensure they participate in community engagement, and for regulatory bodies like the EPA and state agencies to facilitate the process.[75] This Article will discuss community engagement in detail in Part

69. *See id*.

70. *See id.*

71. *See* Oni N. Harton, Note, *Indiana's Brownfields Initiatives: A Vehicle for Pursuing Environmental Justice or Just Blowing Smoke?*, 41 IND. L. REV. 215, 228-29 (2008); *Recent Renewable Energy Policy Shifts: Sparking Development or Resentment?*, BLUE SKY MEDIATION & L. (Apr. 30, 2012), http://blueskymediationlaw.com/renewable energy-policy-shift.

72. *Environmental Justice*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/compliance/environmentaljustice/index.html (last visited Jan. 24, 2014).

73. *See id.*

74. *See id.*

75. *See generally* U.S. ENVTL. PROT. AGENCY, PLAN EJ 2014 (Sept. 2011), *available at* http://www.epa.gov/compliance/environmentaljustice/resources/policy/plan-ej-2014/plan-ej-2011-09.pdf (discussing strategy for incorporating environmental justice into EPA's rulemaking, policy development, and

III.A.

Now, with a general understanding of the *RE-Powering Initiative*'s background and the many benefits to siting renewable energy on contaminated sites, we are ready to delve into the mechanics of how to actually conduct an investigation and plan the project siting.

3. Mechanics

There are three primary considerations in siting renewable energy on contaminated property: site investigation and cleanup, renewable energy siting, and community engagement. The EPA's *RE-Powering Initiative* resources often provide illustrations of the three considerations as progress timelines or phase spectrums running parallel to each other.[76] Then, at several phases along each continuum, key coordination or decision points are identified where the EPA recommends incorporating community engagement and renewable energy stakeholders into the cleanup process.[77]

The EPA sets forth a slightly different series of phases for the three major cleanup programs—Superfund, Brownfields, and RCRA CA—because the processes vary by the cleanup steps mandated by law and the speed at which each individual site is investigated and potentially remediated.[78] The author recommends that the reader of this Article procure Figure 4-1 (Superfund),[79] Figure 4-2 (Brownfields),[80] and Figure 4-3 (RCRA)[81] from the OSWER *Handbook on Siting Renewable Energy Projects* and place them next to each other. These three pages allow the reader to get a birds-eye view of how all three considerations (cleanup, renewable siting, and community engagement) synchronize at each of the three primary types of contaminated sites. The illustrations were developed so that all stakeholders in the decision-making process—federal, state, and local cleanup-project agencies; communities; property owners; developers; and others—would have a common understanding of the typical manner in which the three considerations intersect.[82] In general, each of the three illustrations mentioned above discuss the following three site-evaluation phases of determining if, when, and how renewable energy fits into contaminated site investigation, cleanup, and reuse: initial screening, decision trees, and feasibility studies.

project supervision).

76. *See* RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51, at 14, 19, 24.

77. *See id.*

78. *See id.* at 11.

79. *Id.* at 14.

80. *See* RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51, at 19.

81. *Id*. at 24.

82. *See id.* at 2.

a. Phase 1: Initial Screening

First, the EPA recommends conducting an initial screening. Fortunately for the initial stakeholders interested in pursuing renewable energy, the EPA and the NREL partnered together and created the interactive Google Earth Mapping Tool.[83] The map user can toggle from site to site in order to review detailed information for each of the aforementioned criteria and the six renewable technologies assessed at various scales. The identified sites at the policy screen, for example, are those that have a strong combination of "sufficient size, proximity to roads and transmission lines, a state-sponsored renewable portfolio standard (RPS) to encourage renewable energy development, and renewable energy resources."[84]

Of the estimated "over 500,000 [contaminated] sites and 22 million acres across the 50 states, the District of Columbia, and U.S. territories"[85] tracked by OSWER, there are "more than 11,000 [EPA-tracked] contaminated sites and landfills—covering nearly 15 million acres—with potential for siting renewable energy facilities."[86] If the user also accounts for an additional approximately 13,000 state-tracked sites in the current mapping database, the EPA estimates there are about 70,000 opportunities for renewable energy projects based on the multitude of pairings that exist at the 24,000-plus sites with the six different renewable technologies.[87]

While the Mapping Tool is an extraordinarily useful timesaver, the user should remember that it neither shows every available contaminated site, nor necessarily provides sufficiently detailed information to definitively demonstrate renewable viability. Particularly, if the user is a potential developer, capital investor, or prospective lessee researching future development opportunities, the user should recall that many state-tracked sites have not yet been incorporated into the Mapping Tool.[88] In other words, not every site listed is necessarily a usable site and not every usable site is necessarily listed.

83. *See id.* at 8-9. For instructions to download Google Maps, the EPA's Mapping Tool, directions for the Tool's use, and associated files, see *Mapping and Screening Tools, supra* note 56.

84. RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51, at 8.

85. *Id*. at 3.

86. *Id.* at 8. Appendix B of the *Renewable Energy Projects Handbook* discusses the six renewable energy technologies at various scales considered in determining siting viability on the contaminated land and landfills including: utility scale wind, community scale wind, non-grid connected wind, utility scale photovoltaic solar, photovoltaic policy driven, non-grid connected photovoltaic, utility scale concentrating solar power (CSP) trough system, CSP power tower system, CSP Stirling engine system, biopower facility, biorefinery facility, geothermal flash power plant, geothermal binary power plant, and geothermal heat pump. *See id.* at B-1to -3. The handbook also assessed the potential for landfill gas energy. *See id.*

87. *See* E-mail from Adam Klinger, *supra* note 55; *see also* RE-POWERING SOLAR ON CONTAMINATED SITES, *supra* note 53, at 9.

88. *See* RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51, at 8.

b. Phase 2: Decision Trees

Second, if the site passes the stakeholders' initial screening phase for solar or wind development, then the EPA recommends using its Solar Decision Tree[89] or Wind Decision Tree[90] tools to more critically analyze the site.[91] The decision tree tools provide extremely detailed process overviews for three key steps—prescreening, site screening, and financial screening—intended to assist state and local governments, cleanup project managers, renewable energy developers, and site owners with a more critical technical and economic assessment.[92] The *RE-Powering Initiative* is also considering publishing decision trees for geothermal, concentrated solar power (CSP), and biomass technologies.[93] As of the writing of this Article, however, those tools have not yet been published.[94] On the NREL's Energy Analysis webpage, useful companion tools are provided.[95] One particular low-cost NREL tool soon to be available is the Renewable Energy Optimization (REopt) Tool that will fit into the initial screening and decision-tree phases.[96] The REopt Tool requires limited input from the client-project stakeholder, but then analyzes volumes of data from other databases in order to recommend optimum renewable technologies for specific sites and prioritize the order of site development across a portfolio of potential sites.[97]

c. Phase 3: Feasibility Study

Third, if the stakeholders believe additional research is required to further assess the viability of the property for a particular energy source, the EPA then recommends conducting a feasibility study. While the Mapping Tool and

89. *See generally* U.S. ENVTL. PROT. AGENCY & NAT'L RENEWABLE ENERGY LAB., SCREENING SITES FOR SOLAR PV POTENTIAL, *available at* http://www.epa.gov/renewableenergyland/docs/solar_decision_tree.pdf

90. *See generally* U.S. ENVTL. PROT. AGENCY & NAT'L RENEWABLE ENERGY LAB., SCREENING SITES FOR WIND ENERGY POTENTIAL, *available at* http://www.epa.gov/renewableenergyland/docs/wind_decision_tree.pdf.

91. *See* RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51, at 7.

92. *See id*. at 9.

93. *See id*.

94. The *RE-Powering* staff is working on the next version of the *Initiative*'s Management Plan, which may include one or more new decision trees. *See* E-mail from Adam Klinger, *supra* note 55.

95. *See Jobs and Economic Development Impact Models*, NAT'L RENEWABLE ENERGY LABORATORY, http://www.nrel.gov/analysis/jedi/about_jedi.html (last visited Jan. 24, 2014); *see also* NAT'L ASS'N OF LOCAL GOV'T ENVTL. PROF'LS, CULTIVATING GREEN ENERGY ON BROWNFIELDS: A NUTS AND BOLTS PRIMER FOR LOCAL GOVERNMENTS 10 (Jan. 2012) [hereinafter CULTIVATING GREEN ENERGY], *available at* http://www.nalgep.org/uploads/pdf/publi02.pdf. *See generally* OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, U.S. DEP'T OF ENERGY, SOLAR POWERING YOUR COMMUNITY: A GUIDE FOR LOCAL GOVERNMENTS (2d ed. Jan. 2011), *available at* http://www4.eere.energy.gov/solar/sunshot/resource_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf.

96. *See generally* NAT'L RENEWABLE ENERGY LAB., NREL'S RENEWABLE ENERGY OPTIMIZATION (REOPT) TOOL (Apr. 2013), *available at* http://www.nrel.gov/docs/fy13osti/57727.pdf.

97. *See id*.

decision trees are useful screening devices, stakeholders should neither depend on them as all-inclusive reports, nor use the tools in lieu of focused site assessments to validate resource availability and economic viability.[98] Individual stakeholders might elect to work with the landowner and regulating cleanup agencies to collect more data through the use of onsite sensors, terrain analysis, exploratory drilling, and other methods. Additionally, the parties might contact the EPA and NREL about conducting a feasibility study. Advance planning for siting renewable energy on previously investigated contaminated sites (i.e., Superfund sites) can also result in expedited assessment and inspection timelines, where time consuming inspections were already completed as part of the earlier planning and feasibility phases. Private developers, and a number of third-party consultants, also perform site audits and feasibility studies in order to assess project viability. The EPA and NREL identified forty-one sites for lengthy feasibility studies and posted completed reports for each of them.[99] To date, two feasibility study sites, the Tower Road property in Aurora, Colorado and the Massachusetts Military Reservation have announced development plans.[100]

At the conclusion of the more detailed analysis using the decision trees and the beginning of any feasibility studies, is the point at which stakeholders might begin more active engagement with each other. Specifically, with respect to Superfund sites, the list of potential stakeholders can be quite expansive, including, among others: PRPs, EPA remedial project managers (RPMs) or on-scene coordinators, community stakeholders, renewable energy developers, power generators, and state and local governments.[101] With all of these players, early cooperation is imperative in order to avoid some of the lurking challenges. The RE-Powering Rapid Response Team was formed with the goal of supporting these projects and facilitating communication among these stakeholders.

Such challenges include: uninterested PRPs; no viable site owner with whom to negotiate a development plan because the Superfund has the lead; better or more useful plans for the site; too prolonged of a Superfund cleanup schedule; and late entry by developers, such that schedules are too conflicting to support a partnership.[102] The manner in which cleanup will happen and the associated siting and permitting limitations, institutional controls, and

98. *See* Chris Meehan, *EPA, DOE Introduce Tool for Developing Solar, Wind on Contaminated Lands*, CLEANENERGY AUTHORITY.COM (Apr. 27, 2012), http://www.cleanenergyauthority.com/solar-energy-news/epa-tool-for-developing-solar-on-contaminated-lands-042712 (discussing potential cost-savings from using screening tools, but noting tools not substitute for detailed site investigations after narrowing field of best candidates).

99. *See EPA/NREL Feasibility Studies*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/oswercpa/rd_studies.htm (last updated Jan. 17, 2014).

100. *See* Draft Edits from Adam Klinger, U.S. Envtl. Prot. Agency, to author (2013) (on file with author).

101. *See* RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51, at 16.

102. *See id*.

engineering requirements will all combine to dictate the ways renewable energy can be integrated.[103]

The Brownfields' remediation, reuse-planning, and execution process is generally slightly faster because the sites tend to require less complex remediation, and thus, stakeholders must be familiar with the different phases of the process in which to engage each other.[104] The stakeholders at Brownfields are generally the same as at Superfund sites, with the noted absence of PRPs and RPMs.[105] The potential challenges for Brownfields are also similar to those for Superfund sites, with an additional challenge for Brownfields regarding the size of feasible renewable energy projects because Brownfields are often smaller in property size and are often in closer proximity to local communities.[106]

Additionally, RCRA CA sites are similar to Superfund sites, yet differ in terms of remediation complexity.[107] Recurring RCRA stakeholders include: site owners or operators; EPA project managers; community and other public stakeholders, such as a local land-use planning agency; renewable energy developers; state RCRA CA program regulators; power generators; RE-Powering Rapid Response Teams; and EPA land revitalization coordinators.[108] RCRA challenges include: different state-by-state implementation and enforcement processes, because the RCRA is a state-run program in forty-three states; institutional controls that may be assessed at the earlier facility investigation phase; facilities that can enter baseline testing during the permitting phase; and delays in the overall process because of interim CAs and evolving information about the extent of contamination.[109] The primary difference between RCRA CA sites and the other two properties is that the property is typically linked to an active operating facility in the process of investigation or remediation.

For all three types of sites, until at least the feasibility study phase, it is difficult to know how much liability the developer and other parties might assume throughout the duration of any partnership. Also, interested stakeholders must certainly assess appropriate financing vehicles to actually bring a viable project to fruition. Interspersed throughout this entire process,

103. *See id.* at 10, 12-14. Institutional controls often include such things as zoning, deed notices, easements, restrictive covenants, and fish advisories. *See id.* at 10.

104. *See id.* at 19-21.

105. *See* RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51, at 21 (listing stakeholders typically involved in renewable energy development). The partners at EPA Brownfield sites include: EPA Brownfields coordinators, grantees or property owners, community and other public stakeholders, renewable energy developers, power generators, state and local governments, RE-Powering Rapid Response Teams, and EPA Land Revitalization Coordinators. *See id.*

106. *See id.* at 21.

107. *See id.* at 21, 24.

108. *See id.* at 26.

109. *See* RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51, at 26.

regardless of the type of contaminated property, is ongoing community engagement. As the *RE-Powering Initiative* encourages, the most successful projects are those where the local community was integrated early in the site-planning process in order to identify the community's vision of the future use of the property. While in past years many timing, coordination, and liability challenges might have deterred siting renewable energy projects on contaminated property—as will be discussed below in Part III—recent progress at the local, state, and federal levels has created a more favorable environment for investors and developers. Finally, once the initial stakeholders are confident that the site is a technically and economically viable one on which to incorporate renewable energy consistent with the community's vision, the stakeholders are ready to consider issuing a Request for Proposals (RFP).[110]

By now it should be apparent that the *RE-Powering Initiative* is an extremely valuable program that is paving the way for all interested stakeholders who seek to improve the economic situation, environment, and human health in their communities. This program, recently heralded as a "top government innovation," is sure to foster future renewable energy growth across the country.[111]

III. MITIGATING CHALLENGES

This Part examines five planning considerations that have previously challenged renewable energy growth in general, but even more so on contaminated properties. In a country where petroleum- and coal-based products dominate the electricity-production market, a lack of financial incentives and policy mechanisms have left emerging renewable energy sourcing at a decided disadvantage. Fortunately, in the last two decades, state and federal legislation, acting in concert with EPA programs such as the *RE-Powering Initiative*, have mitigated some of these challenges. The following discussion of some of these advancements includes: community engagement, permitting, RPSs, financing options, and liability protections.

A. Community Engagement and Public-Private Partnerships

Community engagement through public-private partnerships is a critical step on the path to successfully siting any type of energy project.[112] In the context

110. *See id.* at 7.

111. *See* Press Release, U.S. Envtl. Prot. Agency, *Harvard University Recognizes EPA Renewable Energy Program as a Top Government Innovation* (May 1, 2013), http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/c4094857fe9964f585257b5e0055523e!OpenDocument.

112. *See generally, e.g.*, CHARLES BARTSCH, PROMOTING BROWNFIELD REDEVELOPMENT: ROLE OF PUBLIC-PRIVATE PARTNERSHIPS (Apr. 2006), *available at* http://www.nemw.org/images/stories/documents/brownfield%20public%20private.pdf (discussing several ways to build public-private partnerships and benefits of bringing all relevant stakeholders together, including community groups and individual citizens); Sean F. Nolan, *Negotiating the Wind: A Framework To Engage Citizens in Citing Wind Turbines*, 12 CARDOZO J.

of this Article, community engagement is particularly important because the communities surrounding the contaminated property may have different plans for returning the land to a useful state. The EPA clearly identified community engagement as a priority in determining the future use of remediated Superfund properties, as articulated in its 1995 Land Use Directive (OSWER Directive No. 9355.7-04), confirming that this is not a new concept.[113] However, the explosive growth of renewable energy siting and the associated potential impact on the communities is relatively new. Based on data tracked by the *RE-Powering Initiative* as of November 2013, over 507 MW of renewable energy capacity has been installed on 85 contaminated land, landfill, and mine sites.[114]

To the extent possible, communities, regulatory and permitting agencies, property owners, and developers should strive to synchronize land cleanup and the renewable energy project development process with the surrounding community's goals. Although not every cleanup process or project development will unfold in exactly the same way, the one constant is early community involvement. To assist in that process, the EPA provides fairly comprehensive information for its regulators, project managers, and coordinators as described in the OSWER's *Renewable Energy Projects Handbook*[115] and in its *Community Engagement Initiative (CEI) Action Plan* and *CEI Implementation Plan*.[116]

CONFLICT RESOL. 327 (2011) (recommending three approaches for collaborative governance); Uma Outka & Richard Feiock, *Local Promise for Climate Mitigation: An Empirical Assessment*, 36 WM. & MARY ENVTL. L. & POL'Y REV. 635 (2012) (discussing local government's significant impact on climate mitigation and citing to plethora of insightful scholarship addressing local, state, and federal level policy).

113. *See* Memorandum from Elliot P. Laws, Assistant Adm'r., U.S. Envtl. Prot. Agency to multiple EPA Hazardous Waste Division Directors 1, 6 (May 25, 1995), *available at* http://www.epa.gov/superfund/community/relocation/landuse.pdf (discussing benefits associated with fostering community support).

114. CTR. FOR PROGRAM ANALYSIS, OFFICE OF SOLID WASTE & EMERGENCY RESPONSE, U.S. ENVTL. PROT. AGENCY, RE-POWERING AMERICA'S LAND INITIATIVE: PROJECT TRACKING MATRIX 1 (Nov. 2013) [hereinafter RE-POWERING TRACKING MATRIX], *available at* http://www.epa.gov/renewableenergyland/docs/tracking_matrix.pdf.

115. *See* RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51, at 4-5, 7, 10.

116. *See generally* OFFICE OF SOLID WASTE & EMERGENCY RESPONSE, U.S. ENVTL. PROT. AGENCY, COMMUNITY ENGAGEMENT INITIATIVE ACTION PLAN (May 2010) [hereinafter CEI ACTION PLAN], *available at* http://www.epa.gov/oswer/docs/cei_action_plan_12-09.pdf; OFFICE OF SOLID WASTE & EMERGENCY RESPONSE, U.S. ENVTL. PROT. AGENCY, COMMUNITY ENGAGEMENT INITIATIVE: IMPLEMENTATION PLAN 1.0 (May 2010) [hereinafter CEI IMPLEMENTATION PLAN], *available at* http://www.epa.gov/oswer/docs/cei_imp_plan_0510.pdf; OFFICE OF SOLID WASTE & EMERGENCY RESPONSE, U.S. ENVTL. PROT. AGENCY, COMMUNITY ENGAGEMENT INITIATIVE, SECOND YEAR ACHIEVEMENTS: A PROGRESS REPORT (July 2012) [hereinafter CEI PROGRESS REPORT], *available at* http://www.epa.gov/oswer/engagementinitiative/pdf/cei_2012_report.pdf (discussing status of EPA's efforts to meet three enumerated goals of CEI). Goal 1 is to "Develop Transparent and Accessible Decision-Making Processes to Enhance Meaningful Community Stakeholder Participation." CEI PROGRESS REPORT, *supra*, at 3. Goal 2 is to "Present Information and Provide Technical Assistance in Ways That Will Enable Community Stakeholders to Better Understand Environmental Issues and Participate in an Informed Way During the Decision-Making Process." *Id.* Goal 3 is to "Produce Outcomes That Are Responsive to Stakeholders' Concerns and Are Aligned with Community Needs and Long-Term Goals to the Extent Practicable." *Id.*

Community engagement is critical for two main reasons. First, and most importantly, it is an opportunity for regulators and developers to assess the community's vision of what role the potentially contaminated land or limited-use land will play in the future of the community.[117] The EPA and state environmental agencies must talk to local land-use planning authorities and community leadership, hold town hall meetings where citizens can be heard, and demonstrate a clear understanding that the community's concerns are accounted for in the siting calculus.[118]

Community groups often "want to partner in solar power projects to bring the benefits of green energy to their neighborhoods, to show children how solar energy works, and to demonstrate the feasibility of the technology to local residents."[119] However, those same citizens are also accounting for potentially negative environmental, lifestyle, and health impacts. As discussed earlier in Part I, citizens are frequently concerned about other community impacts, such as "the effect visual intrusion to the landscape may have on property values; changes to recreational opportunities or to a sense of place; the distribution of costs and benefits; local attitudes about the intentions of . . . developers; and the character and quality of the planning or decision-making process."[120]

When it comes to wind projects, citizens are often concerned about "adverse impacts on biodiversity, water quality, noise and aesthetics, compensation for lost property value and nuisance, monitoring, and decommissioning of facilities once out of use."[121] The clear message is that often citizens are open to development, but those same citizens also weigh the potential benefits against the very real and life-impacting drawbacks associated with infrastructure development.[122] Failure by developers to account for these concerns can result in project delays and even lengthy litigation.

Second, and similar to the first reason, is facilitating efficient

117. *See* CEI IMPLEMENTATION PLAN, *supra* note 116, at 1.

118. *See id.* (discussing EPA's own agency interests in ensuring community engagement in order to comply with Open Government Directive to ensure transparency, collaboration, and participation).

119. Letter from Lenny Siegal, Exec. Dir., Ctr. for Pub. Envtl. Oversight and Robert Hersh, Research Assoc., Ctr. for Pub. Envtl. Oversight, to Shea Jones, Office of Solid Waste & Emergency Response 1 (Aug. 29, 2012), *available at* http://www.cpeo.org/pubs/CPEOCommentsonMSWSolar.pdf (requesting OSWER to consider adding chapter to Draft *Best Practices for Siting Solar Photovoltaics on Municipal Solid Waste Landfills* to demonstrate commitment to incorporating local communities into siting conversation and planning process).

120. *Id.* at 2.

121. Nolan, *supra* note 112, at 361.

122. *See id*. at 337 (citing VERMONTERS FOR A CLEAN ENVIRONMENT, YEAR-END REPORT (2009)). Additional citizen concerns about wind projects include: "damaged roads; increased traffic; changes to water supplies, streams and wetlands; blasting; habitat fragmentation; increased mortality of birds, bats and other wildlife and domestic animals; reduced quality of life; aesthetics; increased noise; human health; dangers to commercial aviation; reduced property values; lack of corporate accountability; catastrophic failure of turbines; injuries to community; and greenhouse gas emissions." *Id*.

implementation of the proposed project for economic purposes.[123] Developers and investors are well aware that time is money; when project implementation is slowed or brought to a halt, developers and investors quickly lose money, lose other investment opportunities, and may cease work on a project.[124]

B. Siting and Permitting

Closely related to the community engagement discussion above, "negotiated rulemaking" is a particularly valuable trend for developing a receptive and expeditious permitting environment for developers and investors at the state and local levels.[125] Often referred to as "reg-neg," the practice started in the late 1980s at the federal level, but today has migrated to the state and local space.[126] Instead of using only formal rulemaking and policy development, which often leads to subsequent angst and litigation, communities engage in an educational, informed, and open negotiation to produce more workable and pragmatic rules, regulations, and policies.

The goal for local governments and businesses might be to draw clean-energy businesses, develop jobs, and meet state-mandated RPSs. Citizens may want the same economic benefits, but often also desire some mechanisms to address environmental and health-related mitigation measures, compensation remedies, and protective zoning ordinances.[127] Developers and investors value all of those same concerns because they want predictability and a streamlined permitting process the most.[128]

If developers and investors are interested in particular communities where initial screening indicates the potential for siting, *but-for* disadvantageous laws and rules, then they should engage local governments and community groups sufficiently in advance to negotiate for a more attractive siting environment.[129]

123. While the EPA's CEI goals also coincide with community engagement interests for renewable energy developers, investors, and property owners, the EPA does not necessarily share the added business interest of developers and investors that constitutes this second reason: to make money.

124. *See generally* Janice Schneider & Taiga Takahashi, *A Snapshot of Renewable Energy Project Litigation*, LAW360 (Dec. 6, 2012, 10:23 AM), http://www.lw.com/thoughtLeadership/snapshot-renewable energy-project-litigation (discussing observations on renewable energy-development litigation).

125. *See* Nolan, *supra* note 112, at 358-59 (providing background on negotiated rulemaking).

126. *See id.* at 358.

127. *See id.* at 338-42. State and local regulations have attempted to mitigate the adverse impacts, such as: noise, light and visual pollution; wildlife and natural resource harm; human health, safety, and culture degradation; and property value decreases. *See id.*

128. *See generally* ENVTL. LAW INST., SITING WIND ENERGY FACILITIES—WHAT DO LOCAL ELECTED OFFICIALS NEED TO KNOW? (2013), *available at* http://www.eli.org/sites/default/files/eli-pubs/d23-03.pdf (discussing concerns local officials should account for when considering how to incorporate wind energy facilities into communities); BEST PRACTICES, *supra* note 31 (discussing best practices and considerations for siting solar photovoltaic arrays on capped landfills).

129. Jan G. Laitos & Teresa Helms Abel, *The Role of Brownfields as Sites for Mixed Use Development Projects in America and Britain*, 40 DENV. J. INT'L L. & POL'Y 492, 496 (2012) (explaining various governmental regulations and policies may deter Brownfield development).

Likewise, citizens, community and business leaders, and agency rulemakers do now, and should continue to, negotiate in an effort to limit future adversarial environments.

As part of the proactive reg-neg process, one commentator recommends establishing a local siting board policy in which an advisory board is created that assembles anytime a wind-energy project is proposed.[130] This recommendation could easily extend to other types of renewable energy projects as well. While this board does not necessarily meet to set the ground work for the policy development discussed above, the product of those proactive efforts would further serve to create a predictable environment for all stakeholders invested in managing the siting process.

In addition to the more informal reg-neg approach described above—and after first conducting the informal negotiation—states and municipalities should consider memorializing the negotiated end-state into legislation and ordinances. Scholars and practitioners point to a plethora of planning, zoning, and permitting methods to promote renewable energy.[131] At a general policy level, state governments might consider incorporating renewable energy into their enabling acts. A number of states such as Arizona, Colorado, Pennsylvania, Connecticut, New Jersey, and Florida have incorporated provisions that either direct or advise municipalities to assess current and future energy needs, consider how and where to implement renewable energy use, and develop strategies to reduce overall energy consumption.[132] Some states have even gone so far as to enact legislation that "preempt[s] local ordinances or deed restrictions that interfere with the development of solar energy systems, and a smaller number apply similar laws to wind energy equipment."[133]

In the context of contaminated land siting, Florida is an ideal state to evaluate because of the number of potential sites suitable for solar development. A 2007 NREL study commissioned by the EPA indicated that of the nation's 737 potentially contaminated properties suitable for renewable development, Florida had 119 sites suitable for photovoltaic solar projects.[134] Florida has a comprehensive legal framework to facilitate quite efficient methods for permitting power-generation facilities of different sizes.[135] The

130. *See* Nolan, *supra* note 112, at 371.

131. *See* Patricia Salkin, *The Key To Unlocking the Power of Small Scale Renewable Energy: Local Land Use Regulation*, 27 J. LAND USE & ENVTL. L. 339, 344-46, 351-55 (2012); *see also* CULTIVATING GREEN ENERGY, *supra* note 95, at 24-28 (overviewing steps for local governments to promote renewable energy development).

132. *See* Salkin, *supra* note 131, at 352-53.

133. *Id*. at 363.

134. *See* Uma Outka, *Siting Renewable Energy: Land Use and Regulatory Context*, 37 ECOLOGY L.Q. 1041, 1075 n.195 (2010) (citing GAIL MOSEY ET AL., NAT'L RENEWABLE ENERGY LAB., CONVERTING LIMBO LANDS TO ENERGY-GENERATING STATIONS: RENEWABLE ENERGY TECHNOLOGIES ON UNDERUSED, FORMERLY CONTAMINATED SITES (Oct. 2007), *available at* http://www.nrel.gov/docs/fy08osti/41522.pdf)).

135. *See id.* at 1058.

state has two separate centralized licensing processes—one for solar and steam electrical generating facilities generating seventy-five MW or more and one for generation facilities smaller than seventy-five-MW.[136] The Electrical Power Plant Siting Act applies to the seventy-five-MW utility-scale facilities and includes mechanisms to identify energy needs by region, account for local government input through a pleadings process, and review and potentially certify projects through a formalized legal proceeding that is docketed at the very start of the project proposal.[137] This comprehensive statutory scheme ensures a transparent and time-limited process for potential developers.[138]

For facilities generating less than seventy-five MW of energy, generally the Growth Management Act controls.[139] This Act directs municipalities to establish comprehensive development plans, implemented through land-development regulations. The proposed energy projects must comply with the land-development regulations or proceed through a well-defined and transparent land-use change process.[140] This entire process is a joint effort by local planning agencies and the state's Department of Community Affairs to ensure compliance with the comprehensive plan, state law, and established procedures.[141] Other states are also beginning to pass laws that establish similar schemes for managing the permitting process for the varying sizes of renewable projects and are worthy of further research to compare and contrast with Florida's legislative plan.[142]

At the municipal level, there are a number of already tested and proven approaches to encourage development of small-scale renewable energy systems. For example, municipalities have adopted ordinances and regulations that declare renewable energy devices are permitted as of right, some going so far as to allow certain solar and wind systems to exceed height limitations in the relevant zoning district.[143] Regarding solar development, one community in New York went so far as to expressly state in the solar energy regulation that, "[w]hile there are aesthetic considerations, the City has determined that the environmental and economic benefits outweigh potential aesthetic impacts."[144]

Other municipalities have established clear setback and height limitations to foster renewable energy use, while simultaneously preserving adjacent land-owner rights.[145] Local codes that establish solar zones and mandate subdivision

136. *See id*. at 1060, 1064-65.

137. *See id*. at 1060-62, 1071 (citing FLA. STAT. ANN. §§ 403.501-.518 (West 2013)).

138. *See* Outka, *supra* note 134, at 1070-71.

139. *See id.* at 1064 (citing FLA. STAT. ANN. §§ 163.3164-.3217 (West 2013)).

140. *See id.* at 1064-65.

141. *See id*. at 1065-66.

142. *See* Salkin*, supra* note 131, at 344-347, 335 n.47 (discussing various failed or successful attempts by states to set conditions for wind-energy projects, including New Hampshire, Minnesota, Oregon, and Texas).

143. *See id.* at 355, 358.

144. *Id*. at 360 (quoting ALBANY, N.Y., CODE § 375-93(C)(2) (2013)).

145. *See id.* at 357.

development to facilitate increased solar access, or adopt planned-unit development provisions that allow for on-site renewable energy generation in these population dense communities are yet other ideas to ensure sustainable development.[146] Standing requirements for visual-impact assessments or site-planning reviews are valuable tools for determining if and when permits should be issued to allow system installation.[147]

The bottom line is that the most successful project siting happens when all stakeholders can predict the outcome from the start. The recent efforts at the state and local government levels serve to mitigate many of the known siting challenges that communities, regulatory bodies, developers, and investors face.

C. Renewable Portfolio Standards

One of the challenges mentioned earlier in this Part was a lack of state and federal legislation requiring renewable energy as a part of consumer-electricity supply. While no such federal legislation yet exists, over half of the states have enacted state policies, which now mandate incorporation of renewable energy into the electricity-supply portfolio—or in other words RPSs, which are also referred to as Renewable Electricity Standards (RESs). RPSs initially gained traction in the late 1990s when many states started to deregulate or restructure their electric-utility industry in an effort to increase competition.[148] Almost all states with a RPS define eligible renewable energy to include various wind, solar, geothermal, and biomass sources and technologies.[149] Some states also include certain types of hydroelectric power, landfill gas, municipal solid waste, and marine energy.[150]

Under an RPS, utility companies and other types of retail suppliers are required to meet a specified percentage or express number of MW hours of power from the eligible renewable energy sources each year.[151] Generally, states allocate one credit per some designated number of kilowatt hours (kWh) produced by qualified renewable energy facilities.[152] In order to meet that

146. *See* Salkin, *supra* note 131, at 362-63.

147. *See id.* at 359, 361.

148. *See* Richard W. Caperton, Ctr. for Am. Progress, *Renewable Energy Standards Deliver Affordable, Clean Power: Right-Wing Attacks on These Standards Are Misguided* 3 (Apr. 11, 2012), *available at* http://www.americanprogress.org/wp-content/uploads/issues/2012/04/pdf/res_rates.pdf.

149. *Renewable Portfolio Standards (RPS)—What Are They?*, CLEANTECHNICA, http://cleantechnica.com/2013/02/05/renewable-portfolio-standards-rps-what-are-they (last visited Jan. 24, 2014).

150. *See id.*

151. *See generally* DSIRE, http://www.dsireusa.org (last visited Jan. 24, 2014); *Rules, Regulations & Policies for Renewable Energy*, DSIRE, http://www.dsireusa.org/summarytables/rrpre.cfm (last visited Jan. 24, 2014) (providing links to nearly all state RPSs, which variously describe energy providers as: investor-owned utilities, rural electric cooperatives, retail suppliers, municipal utilities, electricity service provider, and some more state-specific entities).

152. *See* FRED SISSINE, CRS REPORT FOR CONGRESS, RENEWABLE ENERGY PORTFOLIO STANDARD (RPS): BACKGROUND AND DEBATE OVER A NATIONAL REQUIREMENT 3 (Sept. 6, 2007), *available at* http://www.cnie.org/NLE/CRSreports/07Sep/RL34116.pdf (discussing basic attributes of RPS and outlining

threshold, the utility has the option to purchase the renewable energy along with the allocated credits from a supplier or buy credits through a credit-trading market.[153] Additionally, the utility may build or purchase its own renewable energy facility to generate some, or all, of its state-mandated quota of renewable energy.[154] Utilities can often bank credits if they purchase or produce an excess of the credits they need for a given year, and in some states utilities can defer a shortage of their mandated percentage until a following year.[155]

As discussed earlier in Part II, renewable energy development requires time and monetary investment for planning, building infrastructure, and establishing a base of skilled professionals and laborers to design, build, and maintain the new infrastructure. A recent study designed to guide states through this important assessment process, discussed below, lists many of the costs and benefits of establishing and maintaining a state RPS.[156] After weighing and balancing these considerations, twenty-nine states, the District of Columbia, and two U.S. territories have settled on some version of a RPS while eight additional states and two U.S. territories established some version of renewable portfolio goals.[157]

The Clean Energy States Alliance's recent study, *Evaluating the Benefits and Costs of a Renewable Portfolio Standard*, identified a number of potential economic and noneconomic benefits a RPS can yield.[158] Some of those benefits include:

- Development of clean and renewable energy;
- Reduction of air pollution, water pollution, water use, thermal pollution

several congressional bills attempting to establish national RPS).

153. *See id.* at 3.

154. *Id.*

155. *See id*. at 3.

156. *See generally* LEON, *supra* note 61; U.S. ENVTL. PROT. AGENCY, ASSESSING THE MULTIPLE BENEFITS OF CLEAN ENERGY: A RESOURCE FOR STATES (Sept. 2011), *available at* http://www.epa.gov/statelocalclimate/documents/pdf/epa_assessing_benefits.pdf (discussing EPA's assessment of benefits of RPSs for state governments, businesses, environment, and citizens).

157. *See Renewable Portfolio Standard Policies,* DSIRE (Mar. 2013), http://www.dsireusa.org/documents/summarymaps/RPS_map.pdf; *see also Rules, Regulations & Policies for Renewable Energy*, *supra* note 151 (listing all U.S. jurisdictions with standards or goals *except*: Alabama, Alaska, Arkansas, Georgia, Idaho, Kentucky, Louisiana, Mississippi, Nebraska, South Carolina, Tennessee, Wyoming, Palau, and American Samoa); *see also* Galen Barbose, *Renewable Portfolio Standards in the United States: A Status Update* 7-8 (Dec. 3, 2012), *available at* http://www.cleanenergystates.org/assets/2012-Files/RPS/RPS-SummitDec2012Barbose.pdf (discussing various design differences). This presentation was presented at the 2012 National Summit on RPS, in Washington, D.C. on December 3, 2012. Barbose, *supra*, at 1.

158. *See generally* LEON, *supra* note 61. The study also recommends three other methods of assessing whether a RPS is a net-gain for a state: an electric rate study, a building blocks evaluation, and economic modeling. *See id.* at 12-13, 19. Certainly a combination of more than one of these three approaches would be valuable and would be the most likely holistic evaluation conducted in either a state-led or consultant-led review.

of waterways, and greenhouse gas emissions;

- Reduction of near-term electricity prices from price suppression effects;
- Increased long-term rate stability;
- Growth of jobs directly connected to constructing, operating, and maintaining facilities;
- Growth of supply, financial, legal, research, and consulting jobs in the clean-energy industry;
- Related spending increases from the multiplier effect of new jobs and expanding tax base; and
- Reduced transmission and distribution costs for development on parcels close to existing transmission infrastructure.[159]

A recent Lawrence Berkeley National Laboratory study indicated that "[i]n states with RES policies in place, at least 33,000 megawatts (MW) of new renewable capacity—equivalent to about 50 average-sized coal plants—were added between 1998 and 2011."[160] Further, the "Union of Concerned Scientists projects that RES policies will support more than 103,000 MW of renewable energy capacity by 2025," of which "[a]t least 87,000 MW of this total is expected to come from new renewable energy."[161] With those numbers it is certainly hard to argue that states should refrain from continuing to seek energy independence, improving our environmental health, and strengthening our economy.

Ensuring a balanced cost-benefit assessment, the Clean Energy States Alliance study goes on to account for potential costs of establishing a RPS. Some costs of establishing a RPS might include:

- Short-term increase in the retail cost of electricity;
- Job losses related to reduced operations or closure for in-state conventional energy generation;
- Negative economic impact resulting from job losses and increased rate paying;
- Transmission-expansion costs if renewable energy generation sites are distant from existing infrastructure and/or upgrade costs for aged or incompatible grid systems;
- Integration costs for independent-system operators and utilities; and

159. LEON, *supra* note 61, at 4-8.

160. UNION OF CONCERNED SCIENTISTS, HOW RENEWABLE ELECTRICITY STANDARDS DELIVER ECONOMIC BENEFITS 3 (May 2013), *available at* http://www.ucsusa.org/assets/documents/clean_energy/Renewable-Electricity-Standards-Deliver-Economic-Benefits.pdf.

161. *Id.*

- Planning and operating reserve costs related to variable power generation at peak demand times.[162]

Of note, none of the listed benefits or costs are specific to renewable energy development on contaminated property. However, all of the considerations are certainly applicable to such sites.

Despite the many variables involved in renewable energy development, states continue to routinely amend their RPSs to increase their target percentages.[163] Some states, particularly the wind-rich Western and Midwestern states and solar-rich Southwestern states, are experiencing an oversupply of energy.[164] The combination of that oversupply and the many realized economic and health benefits resulting from the RPSs drive the expansion and acceleration of their annual renewable energy requirements. There are some state legislatures experiencing pressure to repeal or rollback RPS policies, but none of these efforts have thus far been successful.[165]

In sum, RPSs have proven to be very useful tools for developing renewable energy projects on both greenspaces and contaminated land. With state RPSs as templates and the resulting successes providing lessons learned, now is the time to redouble our efforts to develop a federal RPS. This recommendation will be discussed in detail in Part IV.A.

D. Financing Tools

Much like the other discussions in this Part, the project-financing challenges were also mitigated in recent years.[166] Evolving incentives and financing vehicles continue to improve the landscape for renewable energy projects, including development on contaminated properties.[167] This section will discuss two categories in particular: state and federal incentives, and financing models.

1. State and Federal Incentives

First, and closely tied to the RPS discussion, the expansion of incentives and

162. LEON, *supra* note 61, at 9-11.

163. *See* Barbose, *supra* note 157, at 9-12.

164. *See* UNION OF CONCERNED SCIENTISTS, *supra* note 160, at 16 (noting oversupplies of renewable energy product of low-project costs and federal incentives creating more renewable energy facilities).

165. *See* Clint Wilder, *RPS Attacks Go Against the March of History*, HUFFINGTON POST (Apr. 10, 2013, 2:29 PM), http://www.huffingtonpost.com/clint-wilder/rps-attacks-go-against-th_b_3033682.html (discussing nearly two-dozen states pushing back against fossil-fuel-based attacks on RPS targets); *see also* Barbose, *supra* note 157, at 12 (stating legislation introduced in roughly ten states to repeal or rollback RPS policies).

166. *See* Salkin, *supra* note 131, at 340-45 (discussing several federal and state incentives and referencing several specific state programs in Colorado, Illinois, Massachusetts, Oregon, New York, Washington, Florida, Maryland, California, and Hawaii).

167. *See generally* U.S. ENVTL. PROT. AGENCY, RE-POWERING AMERICA'S LAND INITIATIVE: FINANCING RENEWABLE ENERGY PROJECTS ON CONTAMINATED LANDS (May 2013), *available at* http://www.epa.gov/renewableenergyland/docs/re-powering_financing_fact_sheet.pdf.

subsidies has helped to level the playing field for renewable energy with respect to more traditional energy sources.[168] While state and federal incentives and subsidies for cleanup and renewable energy redevelopment are not perfect, there are more positive trends today than ever before. Regarding state incentives in particular, the author encourages the reader to explore the nearly one-stop database previously cited—the Database of State Incentives for Renewables & Efficiency (DSIRE).[169] DSIRE is frequently updated and provides detail regarding the incentive packages.

The incentives vary from state to state, but often include some combination of grants, loans, bonds, green-energy funds, renewable energy certificate (REC) incentives, tax abatements, tax deductions, and tax credits.[170] DSIRE tables also include numerous links to websites and contact information for relevant state agencies, business associations, and industry and community alliances which can provide the most up-to-date information on all of these incentives. For example, New Jersey and Massachusetts are well known as leaders in the development of robust master plans and regulatory schemes, which provide a combination of REC markets, grants, tax exemptions, rebates, standardized solar easements, standardized interconnection procedures, and net-metering policies.[171]

Federal incentives, also referred to in both resources discussed above, play a critical role in facilitating renewable energy growth. One of the most notable tax incentives is the Federal Renewable Electricity Production Tax Credit (PTC).[172] Although the PTC for solar, biomass, open- and closed-loop geothermal, and other renewable resources was set to expire December 31, 2013, the PTC of 2.2 cents per kWh of produced electricity for wind was set to expire on December 31, 2012.[173]

Fortunately, the American Taxpayer Relief Act of 2012 (ATRA)[174] made

168. *See* MOLLY F. SHERLOCK & MARGOT L. CRANDALL-HOLLICK, CONG. RESEARCH SERV., ENERGY TAX POLICY: ISSUES IN THE 112TH CONGRESS 2-7 (Mar. 28, 2012), *available at* http://www.fas.org/sgp/crs/misc/R41769.pdf (discussing federal tax policy change rationale to remedy disparity between incentives and subsidies available to fossil fuel and clean energy industries).

169. *See generally* DSIRE, *supra* note 151.

170. *See* CULTIVATING GREEN ENERGY, *supra* note 95, at 22; *see also Re-Powering FAQs*, *supra* note 51.

171. *See* CULTIVATING GREEN ENERGY, *supra* note 95, at 22-23.

172. *See* I.R.C. § 45 (2012), *amended by* American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115; *Renewable Electricity Production Tax Credit (PTC)*, DSIRE, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US13F&re=1&ee=1 (last updated Oct. 2, 2013). I.R.C. § 45 originally set the renewable-electricity production credit for any taxable year at 1.5 cents per kWh (in 1993 dollars), as produced by a qualified energy source at a qualified facility during the ten-year period beginning on the date the facility was originally placed in service, and sold by the taxpayer to an unrelated person during the taxable year. *See Renewable Electricity Production Tax Credit (PTC), supra*.

173. *See* Credit for Renewable Electricity Production, Refined Coal Production, and Indian Coal Production, and Publication of Inflation Adjustment Factors and Reference Prices for Calendar Year 2012, 77 Fed. Reg. 21,835 (Apr. 11, 2012).

174. Pub. L. No. 112-240, 126 Stat. 2313.

two significant changes to the Internal Revenue Code, which benefited all qualified renewable energy facilities. First, it extended the PTC for wind to expire on December 31, 2013.[175] Second, it modified I.R.C. § 45 from its original language, which defined a "qualified facility" as one that was *placed in service* before January 1, 2013 (for wind) or January 1, 2014 (for solar, biomass, etc.), to the renewable energy facility with "construction of which begins before January 1, 2014."[176] The ATRA also made other minor changes to the PTC, but none as significant as the amendments listed above.

Another important federal incentive, especially for solar energy, is the business energy investment tax credit (ITC).[177] The American Recovery and Reinvestment Act created a mechanism for some PTC-qualified facilities to choose the ITC instead of the PTC.[178] More recently, the ATRA also amended this credit in a similar way as it amended the PTC. The ATRA modified I.R.C. § 48 from its original language defining a wind qualified investment credit facility as one that was *placed in service* between 2009 and 2012 and other renewable resource qualified investment credit facilities *placed in service* between 2009 and 2013, to read any qualified investment credit facility, "which is placed in service after 2008 and the construction of which begins before January 1, 2014."[179] Additionally, there are several other federal incentives available with narrower applications.[180]

2. Financing Models

Second, the advent of several financing models provides for creative ways to grow the renewable energy market without cost-prohibitive capital investments that otherwise handicap costly start-up projects. While there are several tools available for different circumstances, the one most applicable for this Article is the power purchase agreement (PPA). The PPA, as well as the hybrid version—the third-party PPA—are the leading finance models today for partnering some combination of state and local governments, local utilities,

175. *See id.* § 407(a)(1) (extending PTC for wind facilities to expiration date of January 1, 2014).

176. *See id*. § 407(a)(3)(A); *see also* I.R.C. § 45 (prior to amendment by Pub. L. No. 112-240).

177. *See* I.R.C. § 48; *Business Energy Investment Tax Credit (ITC)*, DSIRE, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US02F&re=1&ee=1 (last visited Jan. 24, 2014) (providing program overview, incentive summary, and links to relevant statutory provisions).

178. *See Business Energy Investment Tax Credit (ITC*), *supra* note 177.

179. American Taxpayer Relief Act of 2012 § 407(b)(C)(ii).

180. *See* U.S. ENVTL. PROT. AGENCY, A GUIDE TO FEDERAL TAX INCENTIVES FOR BROWNFIELDS REDEVELOPMENT 2-3, 15-18 (2011) [hereinafter 2011 BROWNFIELD TAX INCENTIVES], *available at* http://www.epa.gov/brownfields/tax/tax_guide.pdf; *see also Brownfields Tax Incentive Fact Sheet*, U.S. ENVTL. PROTECTION AGENCY (Dec. 2011), http://www.epa.gov/swerosps/bf/tax/ti_factsheet.pdf (discussing Brownfields tax incentive that expired December 31, 2011). *See generally* Julianne Kurdila & Elise Rindfleisch, *Funding Opportunities for Brownfield Development*, 34 B.C. ENVTL. AFF. L. REV. 479 (2007) (summarizing PTC, ITC, renewable energy bonus-depreciation deduction, renewable energy-production incentive, recently lapsed Brownfields expensing tax incentive, and other incentives).

contaminated-property owners, and private developers of renewable energy.[181]

In basic terms, "[u]nder a PPA, the project developer agrees to sell, and the buyer . . . agrees to purchase the energy output of the renewable generating facility."[182] In a traditional PPA, the property owner is also the facility owner and the buyer is a local utility or government.[183] In a third-party PPA, the contaminated-property owner enjoys the benefit of the long-term contractually set price, with the developer (the third-party) assuming the responsibility of the funding, operation, and maintenance of the facility.[184] These two models merit further exploration.

First, the PPA can provide strictly on-site power (sometimes referred to as non-grid scale renewables). In this scenario, generally the renewable power facility is not a utility-sized generator, but is sufficiently large enough to service a significant portion or all of the necessary energy required to support ongoing operations or remediation efforts on the contaminated property.[185]

Second, particularly in states with net-metering programs, the PPA is structured to provide net-excess energy from the siting location back into the local grid.[186] Net metering and applicable public utility commission (PUC) regulations are critical considerations, particularly for utility-scale developers because of the volume of energy produced. If the developer does not have access to a capable transmission grid and a net-metering system for distribution of excess energy, then the wasted power generation leads to such inefficiency that the development is not economically sustainable for the developer. Additionally, if the state PUC regulates the renewable energy facility as an electric utility, then certain economic inefficiencies and permitting regulations may force the developer to site in another jurisdiction instead.[187]

While most states have some form of net-metering and support PPAs, developers must assess whether the applicable state PUC might regulate the renewable energy facility in a way that would limit the feasibility of siting in the proposed state or municipality.[188] Four main regulatory uncertainties for PPAs, described in *Solar PV Project Financing: Regulatory and Legislative*

181. *See* CULTIVATING GREEN ENERGY, *supra* note 95, at 17-18. *See generally* NAT'L RENEWABLE ENERGY LAB., POWER PURCHASE AGREEMENT CHECKLIST FOR STATE AND LOCAL GOVERNMENTS (Oct. 2009), http://www.nrel.gov/docs/fy10osti/46668.pdf; *3rd-Party Solar PV Power Purchase Agreements (PPAs),* DSIRE (Feb. 2013), http://www.dsireusa.org/documents/summarymaps/3rd_Party_PPA_map.pdf.

182. CULTIVATING GREEN ENERGY, *supra* note 95, at 17.

183. *See id*.

184. *See id.* at 18.

185. Due to net-metering requirements, the system would likely be capped at 105-110% of existing loads and would not be sized based on future anticipated loads.

186. *See* CULTIVATING GREEN ENERGY, *supra* note 95, at 18; U.S. Dep't of Energy, *Net Metering*, DSIRE (July 2013), http://www.dsireusa.org/documents/summarymaps/net_metering_map.pdf.

187. *See* KATHARINE KOLLINS ET AL., SOLAR PV PROJECT FINANCING: REGULATORY AND LEGISLATIVE CHALLENGES FOR THIRD-PARTY PPA SYSTEM OWNERS v-vi (Feb. 2010), *available at* http://www.nrel.gov/docs/fy10osti/46723.pdf.

188. *See id.*

Challenges for Third-Party PPA System Owners, include:

- Sellers of electricity included in the definition of an electric utility;
- Power generation equipment included in the definition of electric utility;
- In regulated or partially structured states (hybrid states), electric service suppliers providing energy only to site hosts are included in the definition of utilities or competitive suppliers; and
- Municipal utilities (munis) and rural cooperatives (co-ops) concerns that the PUC will force them to allow customers to choose retail electricity service providers if third parties are allowed to power to customers within their service territory.[189]

The report further details each of these challenges and provides a number of alternatives if the third-party PPA model is not feasible.[190] The DSIRE website provides greater insight into the current status of each state.[191]

In sum, this third-party PPA model is valuable because it facilitates predictable and long-term cleanup and economic benefits for the property owner, the generator, and the buyer. Property owners enjoy a tool to assist with remediating the environmental hazard, renewing the adjacent communities, and ensuring cost-effective energy provision throughout the project. The private developer, its lenders, and investors are rewarded with a siting location and a reliable market demand contracted for generally fifteen to twenty-five years. The buyers—utilities, local governments, local communities, and site owners—are rewarded with consistently priced, reliable, and clean energy. Most importantly, with respect to contaminated properties, this partnership provides a myriad of other economic, health, and aesthetic benefits for the surrounding communities.

E. Liability

Finally, a particularly significant challenge specific to development on contaminated property is potential civil and criminal liability. However, continuing with the theme of challenge mitigation, this section evaluates the progress made in the last dozen years toward providing predictability and transparency for all stakeholders involved in reusing contaminated sites undergoing or following remediation.[192] Liability standards are different

189. *Id.*

190. *Id.*

191. *See* DSIRE, *supra* note 151.

192. *See* U.S. ENVTL. PROT. AGENCY, SITING RENEWABLE ENERGY ON CONTAMINATED LAND AND MINING SITES 16-27, *available at* http://www.epa.gov/superfund/community/pdfs/toolkit/renewable_energy.pdf (proposing ten questions to ask before buying or leasing Superfund property, and demonstrating which answers show significant progress in mitigating liability concerns).

between CERCLA, Brownfield, and RCRA CA sites. As such, this section addresses each type of site separately.

1. CERCLA or Superfund Sites

CERCLA's "polluter pays" liability scheme and "enforcement first" policy, seek to hold PRPs liable before using taxpayer money to remediate contaminated sites.[193] CERCLA identifies the following categories of "persons"[194] as PRPs:

1. The current owner or operator of a facility;
2. An owner or operator at the time of disposal of hazardous material;
3. A person who arranged for the disposal or treatment of hazardous substances (the generator or arranger); and
4. A person who accepted hazardous substances for transport and selected the site to which the substances were transported (the transporter).[195]

From a liability perspective, it makes sense that parties in categories two, three, and four could be held liable for a release of hazardous waste because they were actually handlers of the hazardous waste. Category one, however, raises the question as to why an owner or operator who now owns the facility, but who did not own the facility at the time of disposal, would be held liable. If the current owner or operator knew of the contamination, then that person potentially assumes liability for the contamination upon transfer of the deed. However, that person might also enjoy some protection from liability under a number of CERCLA protections.[196] Two of those protections are relevant for this Article.

First, the current owner or operator of the facility could be an innocent landowner.[197] For the innocent landowner who acquires the property without

193. LIABILITY CONCERNS HANDBOOK, *supra* note 50, at 4.

194. 42 U.S.C. § 9601(21) (2012) (defining "person" to mean "an individual, firm, corporation, association, partnership, consortium, joint venture, commercial entity, United States Government, State, municipality, commission, political subdivision of a State, or any interstate body").

195. *See id*. § 9607(a)(4); *see also id.* § 9601(9), (20), (21) (defining key terms such as "facility," "owner or operator," and "person").

196. *See* LIABILITY CONCERNS HANDBOOK, *supra* note 50, at 12. *See generally* Memorandum from Susan E. Bromm, Dir., Office of Site Remediation Enforcement, U.S. Envtl. Prot. Agency to multiple U.S. Envtl. Prot. Agency Directors (Mar. 6, 2003), *available at* http://icma.org/Documents/Document/Document/4002 (discussing protections for BFPPs, contiguous property owners, and innocent land purchasers).

197. *See* 42 U.S.C. § 9601(35)(A)(i)-(iii) (outlining three categories of innocent landowners: purchasers who acquire property without knowledge of contamination and have no reason to know about contamination; state or local governments under certain circumstances, acting as a sovereign; and person who acquires contaminated property by inheritance or bequest). *See generally* U.S. ENVTL. PROT. AGENCY, CERCLA LIABILITY AND LOCAL GOVERNMENT ACQUISITIONS AND OTHER ACTIVITIES (Mar. 2011), *available at* http://www.epa.gov/compliance/resources/publications/cleanup/brownfields/local-gov-liab-acq-fs-rev.pdf

any knowledge of contamination, that person may have a defense under CERCLA, as long as the person also conducted "all appropriate inquiries" (AAIs)[198] prior to acquiring the property and meets a series of requirements listed pursuant to 42 U.S.C. §§ 9601(35)(A) and 107(b)(3).[199] This "innocent landowner defense" is most valuable for owners who purchased the contaminated property prior to January 11, 2002 because the bona fide prospective purchaser (BFPP)[200] protection enacted by the 2002 Brownfield Amendments of only protects owners who purchased the property after January 11, 2002.[201]

Second, the current owner or operator could be a BFPP. A BFPP is a person (or a tenant of a person) acquiring land who *knows,* or has *reason to know,* of contamination on the property.[202] BFPP status is self-implementing, meaning the BFPP does not seek the approval of or a decision from the EPA regarding their status, but instead asserts the status based upon their meeting the criteria discussed below by a "preponderance of the evidence."[203] These persons may also be protected from liability under CERCLA if they conduct AAIs before acquiring the property, are not otherwise a PRP, do not have a prohibited "affiliation" with a liable party, do not impede any response action or natural-resource restoration, and comply with a series of other requirements during ownership listed in 42 U.S.C. §§ 9601(40) and 9607(r)(1).[204] These remaining requirements include:

- Complying with land-use restrictions and not impeding the effectiveness or integrity of institutional controls;
- Exercising appropriate care with respect to hazardous substances found at the property, including, among other things, taking "reasonable steps" to stop any continuing release and to prevent any threatened future release;
- Providing cooperation, assistance, and access;

(discussing CERCLA liability-defense options for state and local governments considering involvement in contaminated land).

198. *See* 42 U.S.C. § 9601(35)(B) (defining AAI); *see also* 40 C.F.R. § 312.20 (2013) (providing EPA's AAI rule).

199. *See* Memorandum from Susan E. Bromm, *supra* note 196, at Attachment A (discussing no "affiliation" requirement applies despite absence from the statutory provisions for innocent landowners).

200. *See* 42 U.S.C. § 9601(40) (2012) (defining BFPP).

201. *See* LIABILITY CONCERNS HANDBOOK, *supra* note 50, at 7, 11.

202. *See* 42 U.S.C. § 9601(40)(A)-(H). *See generally* Memorandum from Cynthia Giles, Assistant Adm'r, Office of Enforcement & Compliance Assurance, U.S. Envtl. Prot. Agency and Mathy Stanislaus, Assistant Adm'r, Office of Solid Waste & Emergency Response, U.S. Envtl. Prot. Agency to Regional Administrators, Regions I-X (Dec. 5, 2012), *available at* http://www.epa.gov/enforcement/cleanup/documents/policies/superfund/tenants-bfpp-2012.pdf .

203. *See* 42 U.S.C. § 9601(40); *see also* LIABILITY CONCERNS HANDBOOK, *supra* note 50, at 7.

204. LIABILITY CONCERNS HANDBOOK, *supra* note 50, at 6.

- Complying with information requests and administrative subpoenas; and
- Providing legally required notices.[205]

The BFPP protection, particularly the derivative protections afforded to tenants, is often a critical consideration for developers and investors as they assess the viability of a site for a renewable energy project. A developer is rarely a landowner, but instead, leases some or all of the land and is thus characterized as a tenant. While the EPA issued several memoranda since the enactment of the BFPP provision as part of the Brownfields Amendments in 2002—addressing statutory criteria applicable to parties seeking BFPP status, enforcement discretion with respect to tenants, and enforcement discretion with respect to BFPP "affiliation" language—potential BFPP tenants remained concerned about their ultimate liability exposure.[206]

2. Revised Enforcement Guidance for Tenants (December 5, 2012)

On December 5, 2012, the EPA published *Revised Enforcement Guidance Regarding the Treatment of Tenants Under the CERCLA Bona Fide Prospective Purchaser Provision*.[207] This memorandum expressly states that it is "not a rule and it does not create new liabilities or limit or expand obligations under any federal, state, tribal, or local law."[208] It does, however, supersede the EPA's 2009 guidance on enforcement discretion on the same topic of CERCLA § 101(40) tenants.[209] In other words, this 2012 guidance is not a blanket declaration that BFPP tenants cannot or will not be held liable under CERCLA. Rather, it provides the EPA's regional administrators with greater clarity as to how the EPA intends to exercise its enforcement discretion on a site-specific basis.[210]

By extension, it provides potential tenants, such as renewable energy developers and others, the understanding and predictability they need to assess

205. *Id.* at 8.

206. *See generally* Memorandum from Susan E. Bromm, *supra* note 196; Memorandum from Elliott J. Gilberg, Dir., Office of Site Remediation Enforcement, U.S. Envtl. Prot. Agency to Regional Counsel, Regions I-X and Superfund National Policy Managers, Regions I-X (Sept. 21, 2011), *available at* http://www.epa.gov/compliance/resources/policies/cleanup/superfund/affiliation-bfpp-cpo.pdf; Memorandum from Granta Y. Nakayama, Assistant Adm'r, Office of Enforcement & Compliance Assurance, U.S. Envtl. Prot. Agency and Susan Parker Bodine, Assistant Adm'r, Office of Solid Waste & Emergency Response, U.S. Envtl. Prot. Agency to Regional Administrators, Regions I-X (Jan. 14, 2009), *available at* http://thisrealty.com/images/listings/cr1290%20cercla.pdf.

207. *See generally* Memorandum from Cynthia Giles, *supra* note 202 (discussing CERCLA enforcement provisions particularly with respect to tenants). The guidance further supplements and clarifies the EPA's 2011 Affiliation Guidance.

208. *Id.* at 2.

209. *See id.* at 1.

210. *See id*.

their risk exposure. The EPA clearly endeavors to provide maximum transparency for those parties who desire to invest in the reuse of contaminated property.[211] The guidance addresses the standards for the two relationship possibilities for a tenant vis-à-vis a BFPP: tenants where the owner is a BFPP; and tenants where the owner is *not* a BFPP.

First, where the tenant's owner is a BFPP, the tenant may derive its BFPP status from the owner who believes it is a BFPP.[212] While not required by statute, it is probably good practice for the tenant to independently assess whether the owner-BFPP is in fact meeting all of the criteria in order to ensure the tenant will continue to enjoy its BFPP status derived from the owner.[213] Should the owner BFPP lose its status by its own action or inaction, the tenant would generally lose its status as well.[214]

However, "[i]f a tenant has derivative BFPP status through the owner and the owner loses its status through no fault of the tenant, the EPA may exercise its enforcement discretion to treat the tenant as a BFPP under CERCLA § 107(a)(1)."[215] The tenant must meet all of the same criteria that the owner BFPP was required to satisfy, with the exception of the AAI provision.[216] The tenant BFPP would of course need to demonstrate that "all disposal of hazardous substances at the facility occurred *prior* to execution of the lease."[217]

Second, where the tenant's owner is *not* a BFPP, "the EPA intends to exercise its enforcement discretion on a site-specific basis to treat the tenant as a BFPP when the tenant itself meets all of the BFPP provisions in CERCLA §§ 101(40)(A)-(H) and 107(r)(1)."[218] The only nuance is that instead of having to meet the "acquire[d] ownership" after January 11, 2002, the tenant BFPP would need to show that their lease agreement was executed after January 11, 2002.[219]

The EPA diligently maintains resource centers containing documents that discuss liability issues, which this author encourages all readers to explore for source documents used in this Article and for additional information.[220]

211. *See* Memorandum from Cynthia Giles, *supra* note 202, at 1.

212. *Id.* at 3.

213. *See id.* at 3.

214. *Id.*

215. Memorandum from Cynthia Giles, *supra* note 202, at 3.

216. *See id*. The guidance also discusses the EPA's intention "to exercise its enforcement discretion on a site-specific basis by not treating the existence of a lease between the tenant and the owner as a prohibited affiliation," as the tenant would not meet the no-affiliation exception criteria provided under 42 U.S.C. § 9601(40)(H)(i)(II). *Id.* at 4.

217. *Id.* (emphasis added).

218. *Id.*

219. Memorandum from Cynthia Giles, *supra* note 202, at 2.

220. *See generally Redevelopment Tools and Resources*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/oswercpa/rd_tools.htm (last updated Oct. 5, 2013); *Tenant Liability Considerations for Siting Renewable Energy on Contaminated Lands*, U.S. ENVTL. PROTECTION AGENCY (Feb. 4, 2013, 1:00 PM), http://www.clu-in.org/conf/tio/tenant_020413 [hereinafter *Tenant Liability Webinar*] (providing link to one

Further, many potentially contaminated sites are managed or regulated by tribal, state, or local environmental protection agencies, so developers need to coordinate with those entities to assess other available liability mitigation tools.[221] Finally, while the EPA generally will not make determinations of BFPP status or engage with parties on facility-specific transactions, it may, in limited circumstances, address a tenant's liability concerns through a comfort or status letter, or through a prospective lessee agreement in collaboration with the Department of Justice.[222]

As the title of this section—Mitigating Challenges—suggests, liability exposure is a significant challenge for potential developers and investors, but the EPA's efforts to provide predictability and transparency are creating an environment that is much more inviting.

3. State Level Enforcement

As discussed in Part II.A, Brownfields are also properties contaminated with hazardous waste, but which are generally regulated by state and tribal agencies. The 2002 Brownfields Amendments' innocent landowner and BFPP rules outlined above for Superfund sites also apply to Brownfields. However, potential developers and investors need to also familiarize themselves with applicable state Voluntary Response Program (VRP) liability schemes, as most Brownfields regulated by state agencies are impacted by liability provisions in the memorandums of agreement with the EPA.

A great resource that captures the status of state VRPs with respect to cleanup program practices and procedures, funding sources and tools for cleanup, applicable federal and state tax incentives, and liability provisions is the EPA's *State Brownfields and Voluntary Response Programs: An Update from the States*.[223] The report indicates that every U.S. state, except Nebraska, has its own statutory liability-relief scheme.[224] Nebraska does, like most states and territories, have a memorandum of agreement with its respective EPA region (Region 7).[225]

hour archived online webinar wherein slides sixteen through twenty-five focus on EPA's December 5, 2012 Memorandum form Cynthia Giles, and slides twenty-six through thirty-three focus on applicable model comfort and status letters).

221. *See* RENEWABLE ENERGY PROJECTS HANDBOOK, *supra* note 51, at 11.

222. *See* Memorandum from Cynthia Giles, *supra* note 202, at 5.

223. *See* U.S. ENVTL. PROT. AGENCY, STATE BROWNFIELDS AND VOLUNTARY RESPONSE PROGRAMS: AN UPDATE FROM THE STATES (2011), *available at* http://www.epa.gov/brownfields/state_tribal/update2011/bf_states_report_2011.pdf.

224. *See id*. at 83, 123-24.

225. *See id.* at 124; *see also* MEMORANDUM OF AGREEMENT BETWEEN THE NEBRASKA DEPARTMENT OF ENVIRONMENTAL QUALITY AND REGION 7 OF THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (2006), *available at* http://www.epa.gov/brownfields/state_tribal/moas_mous/nb_moa.pdf; *State & Tribal Response Programs Agreements*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/brownfields/state_tribal/moa_mou.htm (last updated Jan. 10, 2013).

As previously noted in Part II.A, the RCRA controls hazardous waste all along the "cradle-to-grave" spectrum—from its generation, through transportation, treatment, storage, and finishing with disposal of the waste.[226] At any point along that spectrum, when a release is identified, either the EPA or a state protection agency may initiate an investigation and potentially take corrective action.[227] The RCRA CA federal or state partner then ensures that the owners or operators of the facilities at which the release and contamination occurred are held liable for the cleanup.[228]

A notable difference between CERCLA and the RCRA is that the RCRA does not have a provision for BFPP liability protection.[229] In the case of RCRA CA sites where there is a RCRA regulated facility owner generally available to hold liable, one of the primary methods to reduce any potential liability exposure for renewable energy developers and investors is to isolate a parcel that is uncontaminated or requires limited remediation on which to build.[230] Through negotiations with local, state, and federal agencies, the isolated parcel is assessed as a Brownfield instead of part of the RCRA CA site.[231] As discussed above, tenants at the Brownfield sites potentially enjoy BFPP status and, on a state-by-state basis, additional liability protections in accordance with the applicable state VRP or VCP.

An incredibly successful example of this method is the Lackawanna Steel Winds I and II project in Lackawanna, New York.[232] A 1600-acre section of land in and around Lackawanna and Hamburg, New York, owned and operated by the Bethlehem Steel Compan, was home to a steel mill that employed over 20,000 people at the zenith of the steel production in the early 1900s.[233] In the 1990s, a decade after the mills were closed, this property was identified for RCRA CA.[234] However, due to liability and financing challenges for Bethlehem Steel and future redevelopment parties, the state and local community made little headway in expediting reuse of the land.[235] In 2006, after improvements to New York State's environmental cleanup scheme,

226. *See Summary of the Resource Conservation and Recovery Act*, U.S. ENVTL. PROTECTION AGENCY, http://www2.epa.gov/laws-regulations/summary-resource-conservation-and-recovery-act (last updated July 26, 2013).

227. *See Waste, Chemical, and Cleanup Enforcement*, U.S. ENVTL. PROTECTION AGENCY, http://www2.epa.gov/enforcement/waste-chemical-and-cleanup-enforcement (last visited Jan. 24, 2014).

228. *See* RCRA CA REPORT, *supra* note 43, at 1.

229. *See* LIABILITY CONCERNS HANDBOOK, *supra* note 50, at 3.

230. *See* CULTIVATING GREEN ENERGY, *supra* note 95, at 10-11.

231. *See id*.

232. *See generally Success Stories—Siting Renewable Energy on Contaminated Land: Steel Winds, Lackawanna, New York, Development of Wind Power Facility Helps Revitalize Rust Belt City*, U.S. ENVTL. PROTECTION AGENCY (May 2012), http://www.epa.gov/renewableenergyland/docs/success_steelwinds_ny.pdf [hereinafter *Steel Winds Case Study*] (describing phases of "Steel Winds" project development).

233. *See id.* at 1.

234. *See id*.

235. *See id.*

including its Brownfields Cleanup Program (BCP), and following several years of remediation on the property, the EPA determined that a particular 30-acre, 2.2 mile long parcel along Lake Erie was sufficiently clean for removal from the RCRA CA program.[236] This parcel was then transferred under New York's BCP and garnered substantial interest for renewable energy development.[237]

In June 2007, the first phase of eight wind turbines (Steel Winds I) was completed along the waterfront, followed by a second phase of six additional turbines in February 2012 (Steel Winds II).[238] Now, the combination of fourteen turbines generates a total capacity of 35 MW of electricity or enough energy to power approximately 15,000 New York homes.[239] It also contributes approximately $190,000 of annual tax revenue for local communities and school districts and provides RECs toward the local utility's obligation to meet its renewable portfolio standard of 30% of renewable energy by 2015.[240]

4. The Status Quo

So how much success has been realized by siting renewable energy on contaminated sites to date? As of April 2013, seventy-three sites in twenty-six states with 216.9 MW of solar PV, wind, solar PV and wind, biomass, and geothermal renewable power generation exist.[241] That represents about 40% growth per annum from the sixteen sites with forty-seven MW of total capacity that existed in 2008 at the inception of the *RE-Powering Initiative*.[242] Dozens of states are honing their existing RPS policies—increasing their target percentages, accelerating their timelines, and improving incentives—all of which demonstrate overall that renewable development is finally gaining speed. Despite the many successes realized and the challenges mitigated across the last twenty years, there is still work to be done. Although there are a number of recommendations ripe for discussion, the next Part addresses two that this author believes would best promote additional siting of renewable energy projects on contaminated land.

IV. RECOMMENDATIONS

This Part will address two primary recommendations to further promote renewable energy siting on contaminated properties. First, citizens must

236. *See Steel Winds Case Study*, *supra* note 232, at 1.
237. *See id.*
238. *See id.* at 2.
239. *See id.*
240. *See Steel Winds Case Study*, *supra* note 232, at 2.
241. *See* RE-POWERING TRACKING MATRIX, *supra* note 114, at 1; *cf. Tenant Liability Webinar*, *supra* note 220, at 10; Sonal Patel, *Trends Show Growth of Renewables on Contaminated Lands*, POWER MAG. (Nov. 6, 2012), http://www.powermag.com/renewables/waste_to_energy/5129.html (discussing highlights of *RE-Powering Tracking Matrix* released in 2012).
242. *See* RE-POWERING TRACKING MATRIX, *supra* note 114, at 1.

continue pushing Congress to establish a federal renewable energy standard. While this recommendation is not contaminated-land specific, the data shows that most of the current renewable-generation siting on contaminated lands is in RPS states. If a target mandate was set for all states as a floor requiring some modest percentage of renewable energy in the electricity-production portfolio for all fifty U.S. states and the District of Columbia, then a plethora of additional utilities would be looking for renewable energy and associated RECs. That demand would incentivize investors and developers to seek out previously unattractive contaminated-land-siting opportunities. Second, the *RE-Powering Initiative* and all RPS states should redouble their efforts to look for opportunities to incorporate contaminated-property incentives into state RPSs.

A. Federal Renewable Portfolio Standard

While RPSs, also referred to as RESs, are flourishing across the country we still lack a federal RPS. The lack of a federal RPS is not due to lack of effort by many in Congress, as a bipartisan alliance of legislators has advanced these proposals as far back as the 105th Congress (1997).[243] Nonetheless, Congress failed to move any of these bills to the President for signature.

More recently, Senator Jeff Bingaman (a Democrat from New Mexico) proposed in his American Clean Energy Leadership Act (ACELA) of 2009 bill an incrementally increasing set of federal RES targets of 3% of qualifying renewable energy in 2011-2013, 6% in 2014-2016, 9% in 2017-2018, 12% in 2019-2020, and 15% in 2021-2039.[244] While setting very modest targets, garnering bipartisan support, and passing out of the Senate Energy and Natural Resources Committee by a vote of fifteen to eight on July 16, 2009, the bill never made it out of Congress.[245] The American Clean Energy Security Act (ACES) of 2009, a similar clean-energy and efficiency bill reported out of the House and placed on the Senate calendar, also failed.[246] The ACES also included a 15% target by 2020, but it further included a greenhouse gas cap-and-trade scheme.[247] The 110th Congress also engaged in a robust debate on a number of bills from both the House and Senate, including RESs and a broader-

243. *See* SISSINE, *supra* note 152, at 4.

244. *See* American Clean Energy Leadership Act of 2009, S. 1462, 111th Cong. § 132 (2009); *see also* MARK HOLT & GENE WHITNEY, CONG. RESEARCH SERV., SUMMARY AND ANALYSIS OF S. 1462: AMERICAN CLEAN ENERGY LEADERSHIP ACT OF 2009, AS REPORTED 1 (Sept. 29, 2009), *available at* http://nepinstitute.org/get/CRS_Reports/CRS_Energy/Renewable_Fuels/Summary_and_Analysis_of_S1462.pdf.

245. *See* PEW CTR. ON GLOBAL CLIMATE CHANGE, ACELA SUMMARY AND COMPARISON TO THE ACES ACT 1 (2009), *available at* http://www.c2es.org/docUploads/acela-summary-aces-act-comparison-oct2009.pdf.

246. *See* American Clean Energy Security Act of 2009, H.R. 2454, 111th Cong. (2009), *available at* http://www.gpo.gov/fdsys/pkg/BILLS-111hr2454eh/pdf/BILLS-111hr2454eh.pdf.

247. *See id.* tit. III.

reaching cousin of the RES, a clean energy standard.[248] Unfortunately, none of these bills survived. Renewable energy proponents nonetheless continue to endeavor to find a way to grow our clean and economically sound energy industries.

1. Benefits

One of the most practical arguments for establishing a federal RPS is that the lack of one "prompts hesitation from energy developers considering an investment in expensive renewable energy technology."[249] As previously discussed in Part III, the state RPSs and the various incentive packages are clear drivers for renewable energy growth. It follows, then, that if many of the states with a RPS are reaping the benefits of electricity-source diversification and developing improved and more cost-efficient technologies, a federal RPS would likely accelerate these advances in states without a RPS.

Referring back to the federal RPS proposed by Senator Bingaman in 2009, the proposal of a 2020 target of 15% renewable energy was estimated to yield an average annual renewable capacity addition from 2012-2020 of six to eleven gigawatts (GW) per year beyond the four to five GW per year estimated to result from then-existing state RPS requirements.[250] That level of growth would certainly contribute to our national goals of reducing our environmental footprint, diversifying our energy base, and achieving energy independence.

The economic value is also quite stunning. Despite the challenging economic times and uncertainties regarding the federal tax incentive, job creation was booming in the wind and solar industries.[251] In 2012, approximately 75,000 full-time jobs existed in the wind industry and 119,000 people were employed in solar-related industries.[252] These renewable energy industries also tend to be more labor intensive, thus creating "more jobs per dollar invested than fossil fuel resources . . . [and] their installation uses primarily local workers, so investment dollars are kept in local communities."[253]

The local economic stimulation from property-tax payments to state and local governments, the earnings from lease, royalty, and right-of-way

248. *See* SISSINE, *supra* note 152, at 4.

249. Paul Hagey, *Greentech for Brown Lands*, ECOMAGINATION (Sept. 8, 2011), http://www.ecomagination.com/greentech-for-brownlands.

250. *See* Barbose, *supra* note 157, at 21.

251. *See* UNION OF CONCERNED SCIENTISTS, *supra* note 160, at 8-9.

252. *See id*. at 9 (discussing statistics from recent American Wind Energy Association and Solar Energy Industries Association reports); SOLAR ENERGY INDUSTRIES ASS'N, *supra* note 18, at 2 (depicting map of U.S. solar job creation); *see also* AM. WIND ENERGY ASS'N, 2012 U.S. WIND INDUSTRY ANNUAL MARKET REPORT: EXECUTIVE SUMMARY (2012), *available at* http://awea.files.cms-plus.com/images/AWEA_USWindIndustryAnnualMarketReport2012_ExecutiveSummary(2).pdf .

253. UNION OF CONCERNED SCIENTISTS, *supra* note 160, at 9.

payments, and the reduced costs associated with importing coal or natural gas for traditional energy production further support the value of renewable energy growth for everyday communities across the country.[254] All of these long-term economic advantages could be duplicated in more locations with a federal RPS or RES.

2. Mitigating Challenges

Despite the many apparent benefits, there are a number of challenges associated with a federal RPS. Some of the most often cited are: inequitable distribution of renewable energies across the various regions of the United States, lack of transmission capacity to transfer renewable-energy-based electricity across states and between states, and increased energy costs for consumers.[255] First, several regions of the country are concerned about their lack of available renewable sources inhibiting their ability to meet federally mandated standards.[256] This concern is entirely valid as states cannot magically generate wind, sun, biomass, or geothermal resources that simply do not exist in sufficient amounts to support mandated targets in a federal RPS. However, if members of Congress ensure they critically assess how to craft the RPS provisions regarding the definition of qualifying renewable energy, enforcement mechanisms and penalties, exemptions and price caps, REC trading and compliance, and other key issues, they can in great part alleviate this disadvantage.[257] Additionally, Congress can mitigate this challenge by ensuring it conducts a detailed assessment of how federal authority intersects with state-vested authority relating to state RPSs, public-utility regulation, and transmission siting.[258] Many of these concerns were addressed in the ACELA and ACES, but not sufficiently to carry the day.

254. *See id.* at 9-10.

255. *See* David Gold, *Renewable Energy Standards: Savvy or Silly?*, ALT ENERGY STOCKS (Mar. 17, 2011, 5:58 PM), http://www.altenergystocks.com/archives/2011/03/renewable_energy_standards_savvy_or_silly.html (discussing several concerns raised by opponents of RESs).

256. *See* SIMON MAHAN, IMPACTS AND IMPLICATIONS OF A CLEAN ENERGY STANDARD: ANALYSIS OF TWO PROPOSED CLEAN ENERGY STANDARDS PROPOSALS AND THE IMPLICATIONS FOR THE SOUTHEAST 7, 9-11 (Jan. 15, 2013), *available at* http://assets.fiercemarkets.com/public/sites/energy/reports/cleanenergystandard.pdf (addressing concerns posed by Southeastern states which are most deprived of two of highest-yielding renewable energy resources: wind and solar); *Spent Fuel: Hearing on S. 2589 Before the Sen. Comm. on Energy & Natural Resources*, 109th Cong. (2006) (Testimony of Hon. David A. Wright, South Carolina Public Service Commissioner) [hereinafter Wright Testimony], *available at* http://www.energy.senate.gov/public/index.cfm/hearings-and-business-meetings?Id=697b67f4-652e-480a-b62a-18bf95c0f7cb&Statement_id=1cf8f607-029b-48fe-924d-68497cac414a (representing ten Southeastern states and specifically addressing lack of renewable resources in South Carolina); Robert J. Michaels, *National Renewable Portfolio Standard: Smart Policy or Misguided Gesture?*, 29 ENERGY L.J. 79, 101-02, 111 (2008); Barbose, *supra* note 157, at 15-17; Jeff Postelwait, *A U.S. Federal Renewable Portfolio Standard: Potentials and Pitfalls*, RENEWABLEENERGYWORLD.COM (Mar. 27, 2009), http://www.renewableenergyworld.com/rea/news/article/2009/03/a-federal-renewable-portfolio-standard-potentials-and-pitfalls.

257. *See* Michaels, *supra* note 256, at 82-83, 91-92, 101, 109-11.

258. *See id.* at 101-02.

Second, and closely related to the first concern, is the nation's transmission capacity. As previously noted, many of the contaminated sites are in relatively close proximity to population centers and are thus premium siting locations that often require limited new local transmission development. However, with much of the nation's best on-shore wind capacity spanning between North Dakota and Texas and the best solar resources being located in the Southwest, significant investment is nonetheless required to upgrade and expand the interstate-transmission infrastructure in order to transfer some of the surplus energy to other parts of the country.[259]

Increased transmission capabilities would both facilitate transferring the renewable-based electricity from these relatively low population regions with an oversupply of renewable energy to higher population regions, and assist those states struggling to meet the federal RPS targets because of limited intrastate renewable resources to import electricity and RECs from the high-yield zones. Just with respect to wind—the resource most likely to dominate in a federal RPS—a DOE study estimated that "12,000 miles of new transmission lines are needed to accommodate a 20 percent wind penetration by 2030 at a $60 billion capital cost."[260] This is no small undertaking, to be sure, but an investment in transmission improvement through congressional action, federal and state coordination, and joint funding initiatives will have to happen either now or later to revolutionize our already inadequate grid.[261]

Third, regarding the potential for increased electricity rate costs for consumers, there is little evidence to indicate that there will be any substantial increase. The Lawrence Berkeley National Laboratory study (cited above in Part III.C) showed that RES compliance-cost data from 2009 to 2010 from fourteen states with RES policies indicated cost impacts of approximately 1.6% or less for all but one of those states.[262] These rate impacts will certainly continue to fluctuate as there are a number of factors involved, but there is little evidence to indicate substantial increases would result if appropriate attention is given to comprehensive-portfolio development. Some of the commonly

259. *See* UNION OF CONCERNED SCIENTISTS, *supra* note 160, at 15 (overviewing transmission siting challenges); *Texas To Double Wind Capacity, Deliver to Major Cities*, SUSTAINABLEBUSINESS.COM (Apr. 1, 2013, 1:31 PM), http://www.sustainablebusiness.com/index.cfm/go/news.display/id/24725.

260. Ed Feo, *Federal Renewable Electric Standard Presents Challenges*, ELECTRIC LIGHT & POWER (July 1, 2010), http://www.elp.com/articles/print/volume-88/issue-4/sections/federal-renewable.html.

261. *See* Matthew L. Wald, *Wind Energy Bumps into Power Grid's Limits*, N.Y. TIMES, Aug. 26, 2008, http://www.nytimes.com/2008/08/27/business/27grid.html?hp=&pagewanted=all&_r=0 (discussing power lines and connections designed for power flow 100 years ago inadequate to handle explosive growth in current demand for electricity and 2005 energy laws that empowered DOE to approve state-regulated grid systems if states failed to act); *Congress Urged To Revamp FERC's Transmission Power To Aid Renewables*, CLEAN ENERGY REP. (Feb. 13, 2013), http://cleanenergyreport.com/201302142424661/Clean-Energy-General/Public-Stories/congress-urged-to-revamp-fercs-transmission-power-to-aid-renewables/menu-id-487.html?S=LI&goback=.gde_78238_member_214310715.

262. UNION OF CONCERNED SCIENTISTS, *supra* note 160, at 5.

referenced factors, which are difficult to quantify, include "declining costs of renewable energy technologies, changes in fossil fuel prices, and the presence of federal incentives."[263]

3. Clean Energy Standard

More recently in the 112th Congress, renewed efforts focused primarily on an alternative to a federal RPS—clean energy standards (CESs). The Clean Energy Standard Act of 2012, introduced by Senator Bingaman on March 1, 2012, was an effort to draw bipartisan support to at least begin moving in the direction of cleaner energy production.[264] The bill, which never made it out of committee, aimed to establish federal standards, which would address not only renewable energy (solar, wind, ocean, current, wave, tidal, and geothermal), but also other low-carbon electricity sources, such as qualified renewable biomass, natural gas, hydropower, nuclear power, and qualified waste-to-energy.[265] The bill attempted to amend the Public Utility Regulatory Policies Act (PURPA) of 1978, which was enacted "to create a market-oriented standard for electric energy generation that stimulates clean energy innovation and promotes a diverse set of low- and zero-carbon generation solutions in the United States at the lowest incremental cost to electric consumers."[266]

Criticism of the proposed CESs includes much of what was evaluated earlier in this section, but also includes concerns that the primary winners under the CES are nuclear power, biomass, and natural gas.[267] While these sources are certainly cleaner than coal and oil, the CES end state is estimated to lose sight of fostering growth in solar, wind, and geothermal.[268] If the goal is to get some sort of legislation enacted that will better our environment, then a CES may be a feasible option. However, if the goal is to place more emphasis on true

263. *Id.*; *see* LEON, *supra* note 61, at 2-3 (discussing multiple variables that make it "very difficult to quantify the precise economic costs and benefits of an RPS" and presenting several models to estimate RPS impacts).

264. *See* Clean Energy Standard Act of 2012, S. 2146, 112th Cong. (2012).

265. *See id.* § 2. The listed clean-energy sources are those produced at facilities, as defined in the Public Utility Regulatory Policies Act of 1978 § 610(b)(1)(A). *See id.* There are three particularly insightful analyses conducted by the U.S. Energy Information Administration (EIA) that merit review: U.S. ENERGY INFO. ADMIN., ANALYSIS OF IMPACTS OF A CLEAN ENERGY STANDARD AS REQUESTED BY CHAIRMAN BINGAMAN (Nov. 2011), *available at* http://www.eia.gov/analysis/requests/ces_bingaman/pdf/ces_bingaman.pdf; U.S. ENERGY INFO. ADMIN., ANALYSIS OF IMPACTS OF A CLEAN ENERGY STANDARD AS REQUESTED BY CHAIRMAN HALL (Oct. 2011), *available at* http://www.eia.gov/analysis/requests/ces_hall/pdf/ces_hall.pdf; and U.S. ENERGY INFO. ADMIN., ANALYSIS OF THE CLEAN ENERGY STANDARD ACT OF 2012 (May 2012), *available at* http://www.eia.gov/analysis/requests/bces12/pdf/cesbing.pdf.

266. Clean Energy Standard Act of 2012, S. 2146, 112th Cong. § 2 (2012). The listed "purpose" is defined in proposed PURPA § 610(a). *Id. See generally* Public Utility Regulatory Policies Act of 1978, Pub. L. No. 95-617, 92 Stat. 3117.

267. *See* M.J. Bradley & Assocs. LLC, *Proposed Clean Energy Standard Act of 2012 Raises Opportunities as Well as Questions* 1-3 (June 5, 2012), http://www.mjbradley.com/sites/default/files/MJBA_CES%20Issue%20Brief_May2012.pdf; *cf.* Chameides, *supra* note 26.

268. *See* M.J. Bradley & Assocs. LLC, *supra* note 267, at 2-3.

renewables, then the CES appears to be only a short-sighted compromise.

In sum, there are challenges for any large-scale legislative effort, like a federal RPS. However, now is the time to invest in solving our energy demand, reducing our carbon footprint, and ensuring energy independence. Our nation must continue an open dialogue to resolve the friction points in order to surmount these obstacles and develop a federal RPS.

B. Contaminated-Property Mandates and Incentives in State Renewable Portfolio Standards

The author also recommends incorporating contaminated-property incentives into state RPSs. The *RE-Powering Initiative* stated in the *2010 Draft Management Plan* that "[s]ome states have used RPS policies that mandate or encourage the use of solar. Similar provisions could be developed that would increase the amount of renewable energy sited on contaminated land."[269] The Action 4 plan intended to "[p]romote model language for an RPS incentive at the state level for the siting of renewable energy facilities on contaminated lands."[270] Unfortunately, during the three years since the management plan was developed, little headway was made on this plan. As sixteen states only just started reaching their first target years of requirements between 2006 and 2012 and only eleven states and the District of Columbia have made major revisions to their RPSs in 2011 and 2012, few opportunities existed for states to incorporate such a change.[271]

However, as more states develop experience with their RPSs and legislatures make improvements to their programs, the *RE-Powering Initiative* should seek opportunities to implement Action 4. Target mandates for production from generators on contaminated land may be a challenge in states with fewer contaminated parcels (as contrasted with greenspaces) for development. Massachusetts, however, may provide a template for other states to follow. In November 2011, Massachusetts established its Clean Energy Results Program, implementing long-term goals to "achieve 50 megawatts of new solar photovoltaic on underutilized contaminated land (landfills and brownfields) helping meet the Renewable Energy Portfolio Standard (RPS) Solar Carve-Out target of 400 megawatts of solar photovoltaic."[272] This is a relatively new goal

269. U.S. ENVTL. PROT. AGENCY, RE-POWERING AMERICA'S LAND INITIATIVE MANAGEMENT PLAN 2-3 (Proposed Official Draft 2009), *available at* http://www.epa.gov/renewableenergyland/docs/repower_management_plant.pdf (discussing Action 4's support of "Objective 1: Provide Effective Technical Assistance and Identify Incentives" as part of "Goal 1: Provide Incentives and Technical Assistance for Siting Renewable Energy on Contaminated Land").

270. *Id.* at 3.

271. *See* Barbose, *supra* note 157, at 9 (depicting graph of states that enacted RPSs and states with major revisions).

272. *About the Clean Energy Results Program*, MASS.GOV, http://www.mass.gov/eea/agencies/massdep/service/energy/program/clean-energy-results-activities-and-goals.html (last visited Jan. 24, 2014) (discussing background, short-term goals, and long-term goals of Clean Energy Results Program established in November

and not much data is available to assess its value or the lessons learned, but the author contends that states should engage the Massachusetts program coordinators and the *RE-Powering Initiative* team to evaluate how best to incorporate this type of mandate into their own RPS or associated programs.

Alternatively, states might consider a RPS provision that establishes a higher value REC paired with power generated from contaminated land, or even funding increased state grants and loans for contaminated land siting. Any mechanism that incentivizes such development would serve the dual purposes of developing renewable energy projects and simultaneously greening some of these contaminated spaces.

This author also recommends that the same or similar incentives could be incorporated into a federal RPS. There is certainly an argument that if our Congress cannot even manage to pass a basic federal RPS between 1997 and the present, then attempting to add language to foster renewable growth on contaminated land is an unnecessary complication. However, as renewable growth on contaminated land has rapidly expanded, particularly in RPS states, some form of increased-value REC (relative to true renewables in greenspaces and other clean energy sources), other financial incentive, or development goal or mandate, could raise the visibility of this type of siting and promote reuse of these blighted lands. Considering that the *RE-Powering Initiative* is a federal initiative and the cleanup statutes (CERCLA, the Brownfield Amendments, and the RCRA) are federal, this added incentive for contaminated land reuse would naturally complement these related federal programs.

V. PULLING IT ALL TOGETHER— THE AEROJET SUCCESS STORY AND THE WAY AHEAD

This Article presents just one success story that demonstrates how solutions to the challenges examined in Part III are facilitating renewable energy development on our nation's contaminated properties. The reader can peruse the *RE-Powering Initiative* website for data on hundreds of other installed systems on contaminated land and numerous other success stories.[273]

A. Aerojet General Corporation Superfund Site (Sacramento, CA)

In 1953, Aerojet General Corporation (Aerojet) acquired approximately 5900 acres of property near Sacramento, California, about a half mile south of

2011).

273. *See generally* RE-POWERING TRACKING MATRIX, *supra* note 114 (showing consolidated list of installed renewable energy systems on contaminated lands, landfills, and mine sites, along with number of tables and graphs representing certain trends across the installed systems); *Fact Sheets and Success Stories*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/renewableenergyland/rd_factsheet_success.htm#success (last visited Jan. 24, 2014).

the American River.[274] At the time, there was little to no residential or commercial development adjacent to the property, although today the property is surrounded by several communities with a mix of zoning areas.[275] Aerojet used the property for several decades to "develop and test solid and liquid fuel rocket propulsion systems to support national defense, space exploration and satellite deployment."[276] In 1983, the EPA assessed the property, declared it a Superfund site, and added it to the National Priorities List (NPL).[277] Remediation then started in the mid-1980s.[278]

1. Community Engagement

After several years of cleanup and developing plans to reuse various lesser or uncontaminated parcels, in 2008, Aerojet started considering siting a renewable energy project on a parcel that had few environmental limitations.[279] All involved stakeholders in the Aerojet project acknowledged how engaging the community facilitated a smooth planning and implementation process.[280] Throughout all phases of the project, the EPA worked with the local communities to share information about the project and solicit feedback to ensure their understanding of the EPA's goal to protect human health and the environment.[281] Aerojet also reached out to the communities to ensure citizen concerns were heard and to apprise them of the status during the various phases of development.[282]

2. Siting and Permitting

Early in the planning process, Aerojet coordinated with the Sacramento Municipal Utility District (SMUD) on SMUD's RPS obligations and vested economic interests that were critical aspects of making the project a success.[283] Ultimately, the SMUD proved to be a pivotal partner, committing $13 million toward the $20 million total cost of the project.[284] Once the SMUD and Aerojet solidified their relationship and plan, they also started consulting with the EPA and applicable state regulators in 2008 and in early 2009.[285] A

274. U.S ENVTL. PROT. AGENCY, GREEN REMEDIATION AND UTILITY-SCALE SOLAR DEVELOPMENT: THE AEROJET GENERAL CORPORATION SUPERFUND SITE AND SACRAMENTO COUNTY, CALIFORNIA 2 (July 2010), *available at* http://www.epa.gov/superfund/programs/recycle/pdf/aerojet.pdf.

275. *See id.*

276. *Id.*

277. *See id.*

278. *See* U.S ENVTL. PROT. AGENCY, *supra* note 274, at 2.

279. *See id.* at 3.

280. *See id.* at 11.

281. *See id.* at 2.

282. *See* U.S ENVTL. PROT. AGENCY, *supra* note 274, at 7, 11.

283. *See id.* at 4.

284. *See id.*

285. *See id.* at 5.

decided advantage in the permitting process was that this solar project was going to be sited on a Superfund site where many of the necessary site assessments and inspections required for the local permitting process were already satisfied.[286] Readers should take note of this benefit as ordinarily these inspections are one of the most time consuming portions of the early planning and feasibility phases.

Another highlight of this particular project—and one that other developers and local permitting agencies across the country seek to emulate—is the Building Permit and Inspection Agreement between Aerojet and Sacramento County.[287] This agreement allowed trained Aerojet staff throughout the planning and implementation phases (and to date) to conduct inspections and issue permits, followed up by annual compliance reviews conducted by the county.[288]

3. Renewable Portfolio Standard

California was an early participant in the RPS trend and today is a leader for the entire country with its high standards. In 2002, California first established its RPS that required 20% of electricity in the state to come from renewable energy by 2017.[289] In 2006, the state legislature accelerated that timeline to 2010.[290] Then, in September 2009, with the Aerojet project in the background, California Governor Arnold Schwarzenegger signed Executive Order S-14-08, yet again raising the bar for electric utilities to incorporate renewable energy into their portfolios. The order established interim incremental targets of 20% by December 31, 2013, 25% by December 31, 2016, and a final mandate of 33% of retail electric sales from renewable energy sources by 2020.[291] While the SMUD already had a superb track record of decades of supporting clean energy and conservation efforts, these ambitious standards certainly must also have contributed to fostering the SMUD's interest in partnering on this six MW photovoltaic solar project.

4. Financing Tools

Aerojet capitalized on a multi-tiered incentive program assembled by the SMUD, which included numerous state incentives and the federal ITC.[292] Given these incentives and the $13 million SMUD commitment, Aerojet started

286. *See* U.S ENVTL. PROT. AGENCY, *supra* note 274, at 7.

287. *See id*. at 7, 12.

288. *See id.* at 7.

289. *See id*. at 4; *see also California: Incentives/Policies for Renewable Energy*, DSIRE, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=CA25R&re=1&ee=0 (last updated Oct. 30, 2013) (citing CAL. PUB. UTIL. CODE §§ 399.11-.24 (West 2013)).

290. U.S ENVTL. PROT. AGENCY, *supra* note 274, at 4.

291. *See id*.; *California: Incentives/Policies for Renewable Energy*, *supra* note 289.

292. *See* U.S ENVTL. PROT. AGENCY, *supra* note 274, at 4, 11.

drafting a third-party Solar PPA in 2009.[293] With much of the community engagement, siting and permitting assessments, and initial financial coordination complete, in November 2008, Aerojet released a RFP.[294] After five months, Aerojet selected Solar Power, Inc. as the project developer in February 2009 and the PPA was drafted between Aerojet and Solar Power.[295] Aerojet chose Solar Power (established in 2005) because of its track record in large-scale commercial and residential solar projects worldwide, its access to many investors and lenders, and its commitment to efficiency exemplified by using the latest technologies.[296]

5. Liability

This project, like so many contaminated-property projects, also struggled with drawing investors to back Solar Power.[297] The executive vice president for solar power commented that "[t]here are so many brownfield and Superfund sites out there that could host renewable energy systems, but that have been ignored because of liability concerns and other issues."[298] Fortunately, by May 2009, all of the final investors and lenders were committed after the PPA parties crafted some PPA language to alleviate those liability concerns.[299] It will be interesting to see in the coming years how much the new EPA tenant BFPP memorandum from December 5, 2012, will help to mitigate liability concerns in other great projects like Aerojet.

Today, the Aerojet project is a forty-acre, 29,000 solar PV panel, six MW power capacity success story.[300] For a water-remediation site that has treated nearly 102 billion gallons of water, the new solar array's capacity to produce approximately 20% of Aerojet's annual energy requirement to operate the remediation system is a significant economic and environmental contribution.[301] To conceptualize that amount of energy, imagine that at the array's six MW peak capacity it would yield enough energy to power 4500 average American homes![302] Further, the EPA's Power Profiler indicates that the solar array reduces Aerojet's pollution production by roughly 4000 tons of carbon dioxide, three tons of sulfur, and three tons of nitrogen oxide per year.[303] The local community college has also capitalized on this project as it

293. *See id.* at 4, 6.
294. *See id.* at 5.
295. *See id.* at 6.
296. *See* U.S ENVTL. PROT. AGENCY, *supra* note 274, at 6.
297. *See id.*
298. *Id.* at 6.
299. *See id.* at 9-10.
300. *See* U.S ENVTL. PROT. AGENCY, *supra* note 274, at 1, 5.
301. *See id.* at 2, 9.
302. *See id.* at 9 (citing California Independent System Operator and stating one MW of utility-supplied power can power 750 average homes).
303. *See id.* at 12.

uses it for a case study in training skilled technicians to work in the renewable energy industry. Aside from the fact that this project supports the site remediation that ensures an improvement in Sacramento County's environmental and human health, and is a positive economic injection into the community, it also contributes to greater national energy independence.

B. Conclusion and the Way Ahead

In the preceding pages, the author examined the emerging trend of siting renewable energy projects on contaminated land. Part I introduced the reader to some of the rationales for further developing clean and renewable energy in general, presented the state of renewable energy as a part of the U.S. electricity market, and explored the concept of siting some of these projects on contaminated land instead of in greenspaces. Part II then presented the EPA's *RE-Powering Initiative* and approach to incorporating renewable energy projects into the remediation and reuse plans for contaminated property.

Part III addressed five challenges which have previously hindered siting renewable energy on such properties, but which today have been sufficiently mitigated to the extent that these properties should be sought-after havens in which to expand our renewable energy production base. Part IV recommended a renewed push to develop a federal RPS and recommended incorporating contaminated-property incentives in both state and federal RPSs. Finally, the Article endeavored to pull it all together by discussing the Aerojet project, which demonstrated the success attainable through this relatively new paradigm shift to renewing our contaminated lands and growing our nation's renewable energy portfolio.

As this Article closes, the author hopes the reader is inspired to further investigate the world of renewable energy, and in particular, siting renewable energy projects on contaminated properties. This truly is an exciting time in the history of renewable energy siting as our nation simultaneously endeavors to return our Brownfields to greenspaces, grow our economy, and advance toward greater energy independence.