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Utilizing Rhode Island's Landfills and Brownfields for Solar Energy Development

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1. Federal Government's Role in Solar Power Developments

1.A. The Energy Policy Act of 2005

On August 8, 2005, President George W. Bush signed the Energy Policy Act ("EPAct") in an effort to quell the Nation's growing energy problems by stimulating research and development, authorizing subsidies, and providing tax breaks for certain renewable energy resources.[1] It was the Nation's first comprehensive energy bill in over thirteen years.

Four years later, an amendment to Title XVII of the EPAct added section 1705 which appropriated an additional six billion dollars towards loan guarantees for eligible renewable energy projects that commenced construction by September 30, 2011.[2] According to the EPAct's report from the Senate Committee on Energy and Natural Resources, one year after EPAct's enactment, 2,000 megawatts ("MW") of new wind power went online and there was a thirty-percent increase of solar thermal collector installations nationwide.[3]

1. B. American Recovery and Reinvestment Act

Congress passed the American Recovery and Reinvestment Act of 2009 ("ARRA"), also known as the Recovery Act, on February 17, 2009.[4] The legislation initially proposed to spend $787 billion dollars in federal funds to rekindle economic activity, create jobs, and provide "unprecedented levels of accountability and transparency in government spending."[5] Congress

[1] Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594.
[2] American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 406, 123 Stat. 115.
[3] The U.S. Comm. on Energy & Natural Resources, The Energy Policy Act of 2005 Anniversary Report (2006). http://energy.senate.gov/public/index.cfm?FuseAction=IssueItems.Detail&IssueItem_ID=b4b9c2f2-118b-4e9b-b5a9-84426f9f5cea&Month=8&Year=2006
[4] *See* American Recovery and Reinvestment Act of 2009, *supra* note 2.
[5] Recovery.gov: Track the Money, http://www.recovery.gov/About/Pages/The_Act.aspx (last visited Oct. 28, 2011).

allocated $16.8 billion dollars to the Office of Energy Efficiency and Renewable Energy ("EERE") for energy efficiency and renewable energy research and development.[6]

The ARRA extended tax credits originally offered by the Production Tax Credit, 26 U.S.C. § 45(d), to projects that generate renewable energy from wind and "certain renewable energy resources" in place after the enactment of the ARRA to December 31, 2013 and December 2014, respectively.[7] The grant is available for qualified systems that have commenced construction prior to December 31, 2011. "The term 'qualified facility' means any facility owned by the taxpayer which is originally placed in service after the date of the enactment of this paragraph [enacted Oct. 22, 2004] and before January 1, 2014 (January 1, 2006, in the case of a facility using solar energy)."[8]

The Department of Energy (DOE) loan guarantee program, under Section 1703 and 1705, promotes solar technology development by "agreeing to repay the borrower's debt obligation in the event of a default."[9]

1. B. 1. Section 1703

Section 1703 of Title XVII of the EPAct authorizes the DOE to "support innovative clean energy technologies that are typically unable to obtain conventional private financing due to high technology risks."[10] Over "$8.5 billion in loan guarantees was made available for innovative solar technologies" through the Section 1703 program.[11]

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[6] U.S. Dep't of Energy, EERE Recovery Program Plan, p. 1 (2009), http://energy.gov/sites/prod/files/edg/recovery/documents/Energy_Efficiency_and_Renewable_Energy_Program_Plan.pdf

[7] American Recovery and Reinvestment Act of 2009 (ARRA), supra note 2, at § 1101.

[8] 26 U.S.C, **§** 45(d)(4) (2009).

[9] U.S. Dep't of Energy Loan Guarantee Program Mission Statement, https://lpo.energy.gov/?page_id=17 (last visited Oct. 28, 2011).

[10] U.S. Dep't of Energy Section 1703 Program, https://lpo.energy.gov/?page_id=39 (last visited Oct. 28, 2011).

[11] Energy Bar Ass'n, *Committee Report: Report Of The Renewable Energy Committee*, 32 ENERGY L. J. 405, 424. (2011).

1. B. 2. Section 1705

Section 1705, the "Financial Institution Partnership Program," expired on September 30, 2011, but "solicitations appropriated an additional $750 million for commercial technology renewable energy projects."[12]

1. B. 3. Section 1603

Section 1603 allows for direct "cash grants in place of the 30% investment tax credit for renewable energy projects" for solar projects in construction by December 31, 2011.[13] A payment is only issued "after the energy property is placed in service."[14] Section 1603 of the ARRA, "offers renewable energy project developers cash payments in lieu of the investment tax credits (ITC)."[15] Out of the 19,875 projects funded nationwide by the Section 1603 program since September 11th, 2011, solar projects account for 19,246 of those projects with $1.3 million dollars awarded.[16] Notably, the wind projects account for only 443 of the 19,875 projects, but have received over $7.2 million.[17]

1. B. 4. Rhode Island's Share of ARRA Funds

As of March 31, 2011, Rhode Island expected to receive $2 billion in ARRA funding.[18] As of June 30, 2011, Rhode Island has been awarded $1,190,678,640 in contracts, grants, and

[12] Energy Bar Ass'n, *supra* note 11.
[13] Senator Sheldon Whitehouse's Comments to Extend 1603, http://whitehouse.senate.gov/newsroom/speeches/speech/?id=f6b4ed9e-a8f1-4678-a2d4-1622059b36a0 (last visited Oct. 28, 2011).
[14] U.S. Dep't of Treasury, Recovery Act, http://www.treasury.gov/initiatives/recovery (last visited Oct. 28, 2011).
[15] Overview and Status Update of the §1603 Program, September 11, 2011. http://www.treasury.gov/initiatives/recovery/Documents/2011-09-11%20-%20S1603%20Overview%20-%20No%20Maps.pdf (last visited Oct. 28, 2011).
[16] *Id.*
[17] *Id.*
[18] Rhode Island Senate Finance, An Update On Rhode Island's Use Of ARRA Funds, May 10, 2011, http://www.rilin.state.ri.us/senatefinance/special%5Freports/ (last visited Oct. 28, 2011).

loans.[19] Of Rhode Island's total ARRA funding, $43 million was earmarked for the development of "alternative energy technology, such as wind turbines, solar arrays, hydroelectric generators, biodiesel, and other innovative technology."[20] Two direct funding institutes, the Rhode Island Office of Energy Resources ("RIOER") and the Public Utilities Commission ("Commission"), have administered $19.3 million through various grant programs.[21] Rhode Island has yet to issue over $14 million of the ARRA funds allocated "to develop new and/or refine existing plans to integrate new portfolios and new applications into energy assurance and emergency preparedness."[22] In Rhode Island, three projects have been funded by the Section 1603 Program totaling a 0.20 MW installed capacity.[23]

Business	**Property Type**	**Amount Approved**	**Award Date**
TD Bank, NA	Solar Electricity	$164,084.00	6/27/11
Westfield Solar, Inc	Solar Electricity	$77,764.00	6/9/11
SGE/Northeast Engineers & Consultants, Inc.	Wind	$155,192.00	2/16/10

Table 1: Rhode Island Projects Listed By the United States Treasury as Receiving 1603 Awards.[24]

2. United States Environmental Protection Agency Programs Supporting Renewable Energy

2. A. Green Power Partnership

The U.S. Environmental Protection Agency ("EPA") created the Green Power Partnership (GPP) for eligible U.S. organization or facilities who buy electricity from eligible

[19] Recovery.gov: Track the Money State Summary Rhode Island, http://www.recovery.gov/Transparency/RecipientReportedData/Pages/statesummary.aspx?StateCode=RI (last visited Oct. 28, 2011).
[20] Rhode Island Senate Finance, *supra* note 18.
[21] *Id.*
[22] *Id.*
[23] Overview and Status Update of the §1603 Program, Table 1: Summary of the 1603 Program by State, p. 3, http://www.treasury.gov/initiatives/recovery/Pages/1603.aspx. (last accessed Sept. 11, 2011).
[24] *Id.*

"green power" sources such as "wind, solar, geothermal, qualifying biomass, and low-impact hydropower" in "amounts proportional to their annual electricity use."[25] Specifically, an organization may qualify as a partner for the GPP if they are either an "organization-wide (U.S. operations only) or a single facility or any logical aggregation of facilities less than organization-wide."[26] The GPP provides resources to local, state, and federal government agencies to encourage leadership "by example by purchasing green power for government operations."[27] The benefits of the GPP include: expert advice in "identifying the green power products that best meet [the] organization's goals;" tools and technical support to make informed decisions about "switching to green power;" assistance in promoting the green power transition within [the] organization; and nation-wide promotion and recognition as an "environmental leader."[28]

2. B. RE-Powering America's Lands

The EPA's "RE-Powering America's Lands" initiative is directly encouraging "renewable energy development on current and formerly contaminated land and mining sites."[29] EPA has "identified more than 11,000 EPA-tracked sites and nearly 15 million acres that have potential for developing solar, wind, biomass and geothermal facilities."[30] The initiative offers a database of information and resources applicable to siting renewable energy projects including a mapping tool which has identified Superfund sites, RCRA Corrective Action sites, abandoned mine land, landfills, and brownfield sites that have received EPA funding.

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[25] EPA's Green Power Partnership: Partnership Requirements, p. 2, http://www.epa.gov/greenpower/documents/gpp_partnership_reqs.pdf (last accessed Sept. 11, 2011).
[26] EPA's Green Power Partnership, *supra* at p.3.
[27] U.S. EPA's Green Power Partnership, http://www.epa.gov/greenpower, (last accessed Sept. 11, 2011).
[28] U.S. EPA's Green Power Partnership, An Environmental Choice for Your Organization, http://www.epa.gov/greenpower/documents/gpp_brochure.pdf (last accessed Sept. 11, 2011).
[29] U.S. EPA Siting Renewable Energy on Potentially Contaminated Land and Mine Sites, http://www.epa.gov/renewableenergyland (last accessed Sept. 11, 2011). For a list of renewable energy maps in Rhode Island *see* http://www.epa.gov/renewableenergyland/maps_data_ri.htm.
[30] U.S. E.P.A Powering America's Land: Siting Renewable Energy on Potentially Contaminated Land and Mine Sites initiative, http://www.epa.gov/renewableenergyland/docs/repower_mapping_tools.pdf (last accessed Sept. 11, 2011).

3. Developing Solar Projects on Landfills

As of 1995, the EPA estimates there are approximately 3,581 Municipal Solid Waste Landfills ("MSWLFs") in the United States.[31] This is a significant decline from the 1986 list which revealed 7,683 MSWLFs.[32] Importantly, this means that there are over 4,000 closed MSWLFs and nearly all of this land remains unproductive.[33] Solar projects on contaminated lands, such as MSWLFs, are in various stages across the Nation; however, because the practice of developing landfills is relatively new there are only a few case studies. Table 2 below provides an overview of solar projects proposed or presently implemented on landfills.

Facility Name	**Location**	**Type**	**Capacity**	**Status**
Fort Carson SWMU 9	Fort Carson, CO	Construction Debris Landfill	2 MW	Completed 2008.
Holmes Road Landfill	Houston, TX	MSWLF	10 MW	Under construction.
Nellis Air Force Base	Nellis Air Force Base, NV	MSWLF	14.2 MW	Completed 2007.
Tessman Road Landfill	San Antonio, TX	MSWLF	1.35 MW	Completed 2009.
Pennsauken Landfill	Pennsauken, NJ	MSWLF	5.5 MW	Completed 2008.
Rothenbach Park	Sarasota, FL	MSWLF	250 kW	Completed 2008.
Hickory Ridge Landfill	Conley, GA	MSWLF	1 MW	Completed 2011.
Indian Orchard	Springfield, MA	MSWLF	2.2 MW	Under construction.
Silver Lake	Pittsfield, MA	MSWLF	1.8 MW	Complete 2010.

[31] U.S. EPA List of Municipal Solid Waste Landfills (1995) http://www.epa.gov/osw/nonhaz/municipal/landfill/intro.pdf (last accessed Nov. 12, 2011).
[32] *Id.*
[33] *Id.*

Forbes Street Landfill	East Providence, RI	MSWLF	12-15 MW	Expected 2012.

Table 2: Summary of solar projects on landfills across the Nation.[34]

4. Rhode Island

4. A. The Energy Outlook in Rhode Island

Rhode Island has the lowest per capita energy consumption in America.[35] According to the DOE, in 2005, the total energy consumption per capita was 213 million Btu.[36] The residential sector in Rhode Island, at thirty-five percent, is the largest consumer of energy with the transportation and commercial sector closely following.[37] Electricity consumption is growing at 1.7% while the state population is growing at 0.5%.[38] Under the EPAct, Rhode Island was required to create an energy conservation goal for 2012 that was below the 1990 energy consumption rate. Rhode Island's 2012 EPAct per capita energy consumption goal is 156.5 million Btu.[39] DOE has yet to determine which of the two measurements, energy consumption per capita or per dollar of gross state product, will be used to report progress of state's EPAct goals in 2012.[40]

[34] *See* WMECO'S Large-Scale Solar Program, http://www.wmeco.com/energywise/largescalesolar.aspx; Gabriel Sampson, *Solar Power Installations on Closed Landfills: Technical and Regulatory Considerations,* Appendix A: Case Studies http://www.clu-in.org/download/techdrct/Sampson_Solar%20Power_Sept2009.pdf (last accessed Nov. 20, 2011).
[35] U.S. Energy Information Administration, Rhode Island http://www.eia.gov/state/state-energy-profiles.cfm?sid=RI. (last accessed Oct. 19, 2011).
[36] U.S. Dep't of Energy, Rhode Island Energy Summary Fact Sheet http://apps1.eere.energy.gov/states/energy_summary_print.cfm?state=RI. (last accessed October 19, 2011).
[37] U.S. Dep't of Energy, Energy Efficiency & Renewable Energy. Economic Indicators for Rhode Island and State Goals for Efficiency under the EPAct http://apps1.eere.energy.gov/states/economic_indicators.cfm/state=RI. (last accessed October 19, 2011).
[38] Rhode Island Energy Summary Fact Sheet, *supra* note 35.
[39] Energy Efficiency & Renewable Energy, *supra* note 36.
[40] *Id.*

Almost all of Rhode Island's electricity generation is fueled by natural gas fuels.[41] Rhode Island's energy production from renewable sources comprises two percent of the total electricity generated.[42]

4. B. Rhode Island Legislation Promoting Renewable Energy

4. B. 1. "The Clean Energy Act" and the Renewable Energy Standard

The Rhode Island General Assembly enacted and Governor Donald L. Carcieri signed the Clean Energy Act ("CEA") on June 29, 2004.[43] The CEA establishes a Renewable Energy Standard ("RES"), which is "designed to diversify energy sources, reduce carbon dioxide, and encourage the development of renewable energy sources" in Rhode Island.[44] Beginning in 2007, the legislation mandated "all obligated entities"[45] to obtain three percent of the electricity sold to "Rhode Island end-use customers"[46] from listed renewable energy sources such as "direct solar radiation; the wind; movement or the latent heat of the ocean; the heat of the earth; small hydro facilities; biomass facilities; [or] fuel cells using renewable resources referenced above."[47]

Ultimately, the RES creates an obligation for the Rhode Island's electricity providers to produce, at a minimum, sixteen-percent of the electricity sold from "eligible renewable energy resources" by 2019.[48] Each year thereafter, the 2019 minimum "shall be maintained unless" the Rhode Island Public Utilities Commission ("Commission") decides the minimum RES is no longer needed.[49]

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[41] U.S. Energy Information Administration, Rhode Island, *supra* note 34.
[42] U.S. Energy Information Administration, Rhode Island, *supra* note 34.
[43] *See* R.I. Gen. Laws §§ 39-26-1, 39-26-10 (LexisNexis 2011).
[44] *Negotiated Rulemaking to Promulgate Rules and Regulations to Implement a Renewable Energy Standard in compliance with R.I.G.L. Section 39-26-1*, R.I. Public Utilities Comm., Docket No. 3659 (2005).
[45] *Id.* at § 39-26-4(a).
[46] *Id.*
[47] *Id.* at § 39-26-5(a)(1)-(7).
[48] *Id.* at § 39-26-4(a).
[49] *Id.* at § 39-26-4 (a)(5).

The CEA only allows two percent of "retail electricity sales" from pre-existing renewable resource facilities to count towards the State's RES obligations.[50] In this respect, Rhode Island cuts a clear path toward the development of new renewable energy facilities. Compliance, however, can be achieved via two other methods. First, compliance can be satisfied though the purchase of NE-GIS (New England Power Pool Generation Information System) certificates: 1) "relating to generating units"; or 2) "from off-grid and customer-sited generation facilities, if located in Rhode Island."[51] Both types of certificates "must be verified by the Commission as eligible renewable energy resources."[52] Second, compliance can be met in part or in total "by making an alternative compliance payment to the Renewable Energy Development Fund established pursuant to § 39-26-7."[53]

4. B. 2. Interconnection Standards

On June 29th, 2011, Rhode Island enacted legislation to encourage "expeditious completion of the application process for renewable distributed generation" by systematizing the process for interconnection applications.[54] First, an applicant may request a "feasibility study" from the electric distribution company to gauge the "cost of interconnecting to the distribution system."[55] The electric distribution company must provide the feasibility study within thirty days upon receipt of an application that requests said study and pays the "feasibility study fee."[56] Then, an applicant must submit an application to the electronic distribution company for an "impact study" and a "request for an estimate of the cost of interconnecting the renewable

[50] R.I. Gen. Laws, *supra* note 43, at § 39-26-4(b).
[51] *Id.* at (d).
[52] *Id.*
[53] *Id.* at (e).
[54] *Id.* at §39-26.3-1.
[55] *Id.* at §39-26.3-3(b) (Authority to request a feasibility study); §39-26.3-2(4).
[56] *Id.* at §39-26.3-3(c); §39-26.3-2(5).

distributed generation resource to the distribution system."[57] The electric distribution company must provide the requested impact study in ninety days.[58]

4. B. 3. Net Metering

In July 2011, Rhode Island enacted a net metering law that requires investor-owned utilities, namely National Grid because they serve over 99% of Rhode Island's customers, to offer net metering to customers who generate electricity using an "eligible net metering resource … as defined in § 39-26-5."[59] In total, however, the net metering in Rhode Island "shall not exceed three percent (3%) of peak load, provided that at least two megawatts (2 MW) are reserved for projects of less than fifty kilowatts (50 kW)."[60] If a customer generates more electricity than they use during a billing period, "the customer shall be paid by excess renewable net metering credits." The renewable net metering credits may, as determined by the utility company, be rolled over to the next billing period or purchased by the utility "in lieu of billing credits."[61]

4. B. 4. Long-Term Contracting Standard for Renewable Energy

In 2009, the Long-Term Contracting Standard for Renewable Energy ("Standard") was enacted to promote stability for the future of renewable energy in Rhode Island.[62] Specifically, the law aims to "stabiliz[e] long-term energy prices, enhanc[e] environmental quality, creat[e] jobs in Rhode Island in the renewable energy sector, and facilitat[e] the financing of renewable

[57] R.I. Gen. Laws, *supra* note 43, at §39-26.3-3(b); §39-26.3-2(3).
[58] *Id.* at §39-26.3-3(d) (90 Day Turn Around Requirement).
[59] R.I. S. Res. 457, Reg. Sess. (2011); *See* R.I. Gen. Laws, *supra* note 43 at § 39-26.4-2(1). American Council on Renewable Energy (ACORE), *Renewable Energy in America: Markets, Economic Development and Policy in the 50 States* http://www.acore.org/files/pdfs/states/reamerica_mar11.pdf. (last accessed Nov. 1, 2011).
[60] R.I. Gen. Laws, *supra* note 43 at § 39-26.4-3(2).
[61] *Id.* at (3)(ii).
[62] *Id.* at § 39-26-1.

energy generation within the jurisdictional boundaries of the state or adjacent state or federal waters …"[63]

The Standard requires electric distribution companies to "annually solicit proposals from renewable energy developers and, provided commercially reasonable proposals have been received, enter into long-term contracts with terms of up to fifteen (15) years for the purchase of capacity, energy and attributes from newly developed renewable energy resources."[64] Additionally, the Standard creates annual goals for electric distribution companies to meet.[65] Importantly, "electric distribution companies will be required to enter into long-term contracts for 90 MW in capacity by 2014, of which 3 MW must come from in-state solar facilities."[66] The solicitation process and each contract is subject to review and approval by the Commission.[67] Significantly, "[l]ong-term contracts are especially important to renewable energy developers because they permit the developers to obtain necessary funding for their projects."[68]

4. B. 5. Rhode Island's Renewable Energy Fund

Rhode Island's Public Utilities Restructuring Act of 1996, which created the Renewable Energy Fund ("RIREF") for renewable energy and demand-side management ("DSM"), was the Nation's first Public Benefit Fund.[69] Enacted in 1996 and extended through 2018 via H.B. 5281 (May 2011), the RIREF was created to promote and incentivize renewable energy projects to aid

[63] R.I. Gen. Laws, *supra* note 43 at § 39-26-1-1.
[64] *Id*. at § 39-26-1-3.
[65] *Id*. at (c)(2).
[66] U.S. Dep't of Energy Database of State Incentives for Renewable & Efficiency, Rhode Island, http://www.dsireusa.org/solar/incentives/index.cfm?re=1&ee=1&spv=1&st=1&srp=0&state=RI (last accessed Nov. 28, 2011).
[67] R.I. Gen. Laws, *supra* note 43 at § 39-26-1-3(b) ("The commission shall approve the contract if it determines that: (1) the contract is commercially reasonable; (2) the requirements for the annual solicitation have been met; and (3) the contract is consistent with the purposes of this chapter.").
[68] Conservation Law Foundation Statement on R.I. Wind Contract, http://www.clf.org/newsroom/clf-statement-on-rhode-island-wind-contract/ (last accessed Nov. 28, 2011).
[69] U.S. EPA, State Climate and Energy Program, http://www.epa.gov/statelocalclimate/state/tracking/individual/ri.html (last accessed Oct. 23, 2011).

the State in meeting the RES.[70] The fund raises $2.5 million each year by charging $0.0003/kWh for renewable energy programs and 0.0002/kWh for "demand side management programs."[71] The legislation placed the Rhode Island Economic Development Corporation ("RIEDC") at the helm of collecting fees from electricity consumers for the renewable energy programs as well as administering grants from the RIREF.[72]

The RIREF provides incentives for, among other things, municipal renewable energy projects and technical and feasibility studies.[73] By mid-November 2008, RIEDC was required to create the "Municipal Renewable Energy Investment Program" to "fund qualified renewable energy projects" by providing up to $500,000 in grant money per project.[74] The legislation outlines four considerations for RIEDC's consideration in ranking a qualified municipal renewable energy project: "(i) the feasibility of project completion; (ii) the anticipated amount of renewable energy the project will produce; (iii) the potential of the project to mitigate energy costs over the life of the project; and (iv) the estimated cost per kilowatt hour (kwh) of the energy produced from the project. Municipalities that have not previously received financing from this program shall be given priority over those municipalities that have received funding under this program."[75]

5. Siting a Solar Project on a Landfill or Brownfield in Rhode Island

5. A. Federal Laws Applicable to Rhode Island's Landfills

[70] R.I. Gen. Laws, *supra* note 43 at § 39-2-1.2; *Id*. at § 39-26-7.
[71] *Id*. at § 39-2-1.2 (b). *See* R.I. Renewable Energy Development Fund 5 – Year Strategic Plan, p.11, January 1, 2009, http://www.riedc.com/files/REF-Strategic-Plan.pdf (last accessed Oct. 23, 2011).
[72] R.I. Gen. Laws, *supra* note 43 at § 42-64-13.2 (d); *Id.* at § 39-26-7 (a).
[73] R.I. Economic Development Corporation, Renewable Energy Fund, http://www.riedc.com/business-services/renewable-energy (last accessed Oct. 23, 2011).
[74] R.I. Gen. Laws, *supra* note 43 at § 39-2-1.2(c); *Id.* at § 39-2-1.2(c)(2); *Id.* at § 39-2-1.2 (c)(3) ("Qualified municipal renewable energy projects means any project that produces renewable energy resources and whose output of power and other attributes is controlled in its entirety by at least one Rhode Island city or town.").
[75] *Id.* at § 39-2-1.2(c)(1)(i)-(iv).

Landfills are subject to regulations under Subtitle D of the Resource Conservation and Recovery Act of 1976 ("RCRA"), which gives EPA the authority to "regulate generation, transportation, treatment, storage and disposal" of hazardous and non-hazardous solid waste from the "cradle-to-grave."[76] RCRA has been amended nine times, but the Hazardous and Solid Waste Amendments of 1984 ("HSWA") are particularly significant. HSWA gave the federal government authority, among other things, to establish national regulations for all MSWLFs to "ensure the protection of human health and the environment."[77] MSWLFs must comply with Subtitle D of RCRA, or alternatively, with equivalent state regulations.[78] The federal MSWLF standards incorporate: location restrictions, composite liner requirements, leachate collection and removal systems, operating practices, groundwater monitoring requirements, closure and post-closure care requirements, corrective action provisions, and financial assurance.[79]

In Rhode Island, the Department of Environmental Management ("RIDEM") is an EPA "approved state," and thus, "has been delegated the authority by EPA to implement and enforce its own regulations for hazardous waste management under RCRA. The state program must be at least as stringent as the federal standards."[80]

Rhode Island has over one hundred landfills.[81] As of 2007, thirty landfills are undergoing evaluation through various State and Federal programs.[82] In the 1980's, RIDEM submitted a list of all known landfills for inclusion in the EPA's Comprehensive Environmental

[76] Resource Conservation and Recovery Act of 1976, Pub. Law **9**4-580, 42 U.S.C. §§ 6901 et. al. (1976); U.S. EPA Summary of the RCRA http://www.epa.gov/lawsregs/laws/rcra.html (last accessed Nov. 28, 2011).
[77] 40 C.F.R. § 258(a) (1991).
[78] *See id.*
[79] U.S. EPA Non-hazardous Waste, Municipal Solid Waste http://www.epa.gov/osw/nonhaz/municipal/landfill.htm (last accessed Nov 27, 2011); *See* Municipal Solid Waste Landfill Criteria Technical Manual, Chp. 6, Subpart F Closure and Post-closure http://www.epa.gov/osw/nonhaz/municipal/landfill/techman/subpartf.pdf (last accessed Nov 27, 2011).
[80] U.S. EPA Glossary, Appendix D http://www.epa.gov/osw/hazard/wastetypes/pdfs/appd.pdf. (last accessed Nov 27, 2011).
[81] R.I. Dep't of Envtl. Mgmt. Closure Policy for Inactive or Abandoned Solid Waste Landfills, Policy No. WM-SW-2007-02 (Mar. 1, 2001) (RIDEM Closure Policy).
[82] *Id*. at p.1

Response, Compensation, and Liability Information System (CERCLIS), "a federal inventory of actual or potential contaminated properties."[83] CERCLIS listing triggers federal laws such as the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), also known as the "Superfund," in addition to state regulations.[84] The Superfund is "a program administered by the EPA to locate, investigate, and clean up the worst hazardous waste sites throughout the United States."[85] In New England, over 500 sites have been remediated through the Superfund, however, not every landfill is on the National Priories List ("NPL") or subject to the full Superfund process.

The EPA conducts a preliminary assessment ("PA") to determine "whether a site poses little or no threat to human health and the environment or if it does pose a threat, whether the threat requires further investigation."[86] If the PA prompts further action, a site inspection is performed ("SI") to determine if hazardous substances are, in fact, being released to the environment and, then, assigns a rank to the site according to the Hazard Ranking System ("HRS"). "Sites with an HRS score of 28.50 or greater are eligible for listing on the NPL and require the preparation of an HRS scoring package."[87] A site may be deleted from the NPL if the EPA "determines that no further response is required to protect human health or the environment."[88]

Rhode Island NPL	**Location**
Central Landfill	Johnston
Centerdale Manor Restoration Project	North Providence

[83] RIDEM Closure Policy, *supra* note 81 at p.1.
[84] 42 U.S.C. § 9601 et. al (1980) (subsequently amended by Superfund Amendments and Reauthorization Act of 1986 (SARA) and Small Business Liability Relief and Brownfields Revitalization Act of 2002).
[85] U.S. EPA Envirofacts CERCLIS, http://www.epa.gov/enviro/facts/cerclis/ (last accessed Nov 27, 2011).
[86] U.S. EPA Superfund Preliminary Assessment/Site Inspection http://www.epa.gov/superfund/cleanup/pasi.htm (last accessed Nov 27, 2011).
[87] *Id.*
[88] U.S. EPA How Sites are Deleted from the NPL, http://www.epa.gov/superfund/programs/npl_hrs/nploff.htm (last accessed Nov 27, 2011).

Davis Liquid Waste	Smithfield
Davis (Gsr) Landfill	Glocester and Smithfield
Davisville Naval Construction Battalion Center	North Kingstown
Landfill And Resource Recovery, Inc. (L&Rr)	North Smithfield
Newport Naval Education/Training Center	Newport, Middletown, Portsmouth, and Jamestown
Peterson/Puritan, Inc.	Cumberland and Lincoln
Picillo Farm	Coventry
Rose Hill Regional Landfill	South Kingstown
Stamina Mills, Inc.	North Smithfield
West Kingston Town Dump/Uri Disposal Area	South Kingstown
Western Sand & Gravel	Nasonville

Table 3: List of Rhode Island Landfills on the EPA's National Priorities List.[89]

5. B. Site Control

Site control is a key step in developing a renewable energy project on a landfill or brownfield because it secures a legally recognized and enforceable right to use the land on which the project will be built.[90] Site control involves acquiring a legal interest in the land as well as adequate access to the site.[91] It is critical for both the municipality and the developer to secure site control early in the planning process because it is often a prerequisite to receiving grant money and permits.[92]

In the early siting and feasibility stages before acquiring a long-term site control agreement, the parties may wish to reach an option agreement which secures the exclusive right to obtain or negotiate a potential purchase or a long-term lease.[93] If the project proves to be

[89]U.S. EPA Waste Site Cleanup & Reuse in New England http://www.epa.gov/region1/superfund/ (last accessed Nov. 30, 2011).
[90] *See* Farmer's Guide to Wind Energy, Chp. 3 Negotiating Wind and Land Agreements (last accessed Nov. 28, 2011); *citing* Nancy Lang and William Grant, Landowner's Guide to Wind Energy in the Upper Midwest 44 (Izaak Walton League of America, 2nd prtg. 2001).
[91] *Id.*
[92] *Id.*
[93] *Id.*

potentially successful after feasibility studies and investigations, then a more appropriate site control method can be agreed upon.[94]

The most common forms of site control include a purchase and sale agreement, a lease, or an easement for a specific use and time period. Acquiring ownership of the land may be inefficient at the investigatory stages of a solar project, especially prior to remediation, if the project fails for any reason.[95] Therefore, a lease may be more practical.[96]

A lease is "a contract by which a rightful possessor of real property conveys the right to use and occupy that property in exchange for consideration."[97] In a lease agreement, ownership is not transferred, but the lessee, the developer, is granted a right to use the property for a specified time and purpose in exchange for payments made to the lessor, the landfill owner. The terms of the lease agreement can be tailored to meet the contracting parties' needs. A lease agreement should: define the premise to be leased: provide for market rate compensation (varies based on value of resource and value of land for other uses); define rights reserved to lessor/lessee; define the level of lessor/lessee cooperation and responsibility; and include insurance, indemnification, and a decommissioning provisions.[98]

A developer, in negotiation of the lease, should endeavor to secure the right to access the property, build the solar installation and associated infrastructure, and ensure that future development will not impact the productivity of the solar project, e.g. a right to unimpeded solar power. The landfill owner, on the other hand, should endeavor to ensure proper site security, that a potential developer seeks permission for certain activities, and that compliance with

[94] Farmer's Guide to Wind Energy, *supra* note 90.
[95] Community Wind Oregon guidebook, http://www.nwseed.org/Educational%20Resources/publications/Guidebook/Section%204%20Site%20Control.pdf. (last accessed Nov. 28, 2011).
[96] Farmer's Guide to Wind Energy, *supra* note 90.
[97] Black's Law Dictionary 405 (2nd ed. 2001).
[98] Farmer's Guide to Wind Energy, *supra* note 90.

federal and state regulations will be maintained. Specific economic considerations for a lease agreement are covered in detail elsewhere.

A development easement is "an interest in land owned by another person, consisting of the right to use or control the land, or an area above or below it, for a specific limited purpose."[99] An easement differs from a lease agreement, as "it does not give the holder the right to possess, take from, improve, or sell than land."[100] Aside from the development easement, which would allow only a specific use of the land for solar project installation, solar easements, which are granted to assure access to sunlight, is another tool to consider. Owners of the surrounding property may grant a solar easement whereby they agree to either allow a transmission line to cross or avoid building structures or planting tall trees that may block the sun from the solar installations. For a deeper consideration of solar access laws see Section 5. D. 3.

5. C. Permitting

State and local government permitting and land use policies may present distinct challenges in siting a solar project. The following section provides the landfill owner, or the Responsible Party, with information to navigate the permitting process in Rhode Island.

5. C. 1. Certificate of Closure

The RIDEM, with support from the EPA, developed the Landfill Closure Program ("LCP") "in an effort to by-pass the Federal Superfund Process and streamline the investigation, remediation and closure" of landfills.[101] The LCP applies to "landfills that ceased operation prior to April 1992," and the RIDEM is encouraging municipalities to participate voluntarily. Therefore, because it is based on voluntary participation or serious environmental contamination, which would prompt RIDEM or EPA to act, an inactive or abandoned solid waste landfill in

[99] Black's Law Dictionary 226 (2nd ed. 2001).
[100] *Id*.
[101] RIDEM Closure Policy, *supra* note 81, at p.1.

Rhode Island may or may not have a Certificate of Closure ("Certificate"). A solar installation cannot move forward until a landfill is properly closed and has acquired a Certificate from the RIDEM pursuant to the regulations and policy of the LCP.[102]

If a Responsible Party possesses a Certificate for a landfill, then the LCP is complete. The Responsible Party, however, must still seek approval from RIDEM to site a solar project. This approval is required because RIDEM retains regulatory jurisdiction indefinitely over a licensed landfill pursuant to an environmental land use restriction, a "perpetual conservation easement," recorded in the land evidence records.[103] In fact, a "perpetual conservation easement" is a "condition of issuance of a license for a solid waste management facility."[104] The perpetual conservation easement prohibits "any excavation or other disturbance or construction of the facility site without prior written approval from the [RIDEM]."[105] To gain approval, a Responsible Party need only contact RIDEM to discuss the potential plans for the solar installation.[106] RIDEM may approve the solar installation so long as it does not violate the regulations applicable to landfills or threaten human health or the environment.

If a Responsible Party does not possess a Certificate, the landfill will be subject to the LCP and compliance with RIDEM's Rules & Regulations for the Investigation and Remediation of Hazardous Material Releases ("Remediation Regulations") is required. Additionally, the RIDEM "may also require the landfill to comply with such provisions of its current Rules & Regulations for Solid Waste Management ("Solid Waste Regulations") as may be necessary to address any actual or potential threats to human health or the environment presented by the

[102] *See* RIDEM Closure Policy, *supra* note 81, at p.1. (A Certificate of Closure may have also been issued by the Department of Health.)
[103] R.I. Dep't of Envt. Management Solid Waste Regulations No. 1 & 2, § 2.1.11 (1997) (amended 205) (Solid Waste Regulations).
[104] *Id.*
[105] *Id.*
[106] Conversation with Laurie Grandchamp, R.I. Dep't of Envt. Management (Oct. 14, 2011 10:30:00 EST) (on file with author).

landfill."[107] RIDEM requires at least ninety days notice prior to the closure of a landfill.[108] Significantly, completion of the LCP would not only achieve compliance with the applicable state regulations, but the landfill may be eligible to receive a "No Further Action" letter from EPA and removal from the Federal CERCLIS.[109]

5. C. 2. Achieving Compliance

5. C. 2. a. Investigation and Remedial Decision Letter

An approved Site Investigation Work Plan (SIWP), which is developed by an environmental consultant hired by the Responsible Party, and a signed Memorandum of Agreement between the Responsible Party and RIDEM should be completed before any investigation begins.[110] Pursuant to § 7.00 of the Remediation Regulations (Site Investigation) and Rule 2.1.09 of the Solid Waste Regulations (Closure and Post-Closure Plans and Financial Assurance), the investigation should 1) assess the nature and extent of the contaminated site and 2) evaluate at least two potential remedial alternatives.[111]

The SIWP, a voluntary process until the RIDEM Director proscribes otherwise, should describe "the objectives of the Site Investigation, the data that is necessary to meet those objectives, and the methods which will be used to collect that data."[112] Next, after the investigation is complete a Site Investigation Report (SIR) (§ 7.03) and the necessary Certification Requirements (§ 7.05) must be prepared and submitted to the RIDEM for review

[107] RIDEM Closure Policy, *supra* note 81, at p. 4.
[108] Solid Waste Regulations, *supra* note 103.
[109] RIDEM Closure Policy, *supra* note 81, at p.1. (This delisting from the federal list occurs in two stages. First, when RIDEM approves the RAWP, RIDEM "may request that EPA change the CERCLIS site status to be 'subject of voluntary remediation pursuant to the Remediation Regulations.'" Second, after RIDEM issues a Letter of Compliance or Interim Letter of Compliance, RIDEM "may request that EPA archive the site, removing it from the list of active CERCLIS sites.).
[110] *Id.*
[111] RIDEM Rules & Regulations for the Investigation and Remediation of Hazardous Material Releases, § 7.01, 7.04, (1996) (amended in 2004) (Detailed guidance pertaining to the scope of the SIR is provided in § 7.03) (Remediation Regulations).
[112] *Id*.

and approval. If the SIR is "deemed unacceptable" RIDEM will identify the reasons for the rejection of the SIR and "direct the Performing Party to correct the deficiencies."[113] If the SIR is approved, RIDEM will identify the preferred remedial alternatives in a Remedial Decision Letter. Under § 7.07, public notice is required "prior to the implementation of the Site Investigation field activities" and "prior to the formal Department approval of the Site Investigation Report (in the form of a Remedial Decision Letter)."[114] Therefore, before RIDEM issues a formal approval via the Remedial Decision Letter, the remedial method is still "subject to public review and comment regarding the technical feasibility."[115] After the public review and comment period, the decision record must include a finalized SIR and a "final response to substantive public comments" before RIDEM can issue a formally-approved site remedy.[116]

5. C. 2. b. Remedial Action Work Plan and Remedial Action

When a Remedial Decision Letter from RIDEM has been obtained, a Remedial Action Work Plan ("RAWP") detailing *how* the proposed Remedial Action will be implemented must be submitted for RIDEM approval before any remediation activities take place.[117] The RAWP shall "present a remedial action which addresses remedial objectives for all impacted media" as consistent with § 8.00.[118] This may include groundwater objectives, surface water and sediment objectives, soil objectives, and air objectives.[119] The RAWP must "clearly explain the proposed remedy and justify the ability of the remedy to meet the remedial objectives."[120] Specifically, the RAWP must provide: a "proposed schedule for implementing the proposed remedial

[113] Remediation Regulations, *supra* note 111, at § 7.08.
[114] *Id.* at § 7.07(A), § 7.07(B).
[115] *Id*. at § 7.09.
[116] *Id*. at § 7.07(A), § 7.07(B).
[117] *Id*. at § 10.00.
[118] *Id*. at § 9.02.
[119] *Id*. at § 9.02(A)-(D).
[120] *Id*. at § 9.03.

action;"[121] a "site plan;"[122] the "contact information of those contractors or consultants hired to implement or operate the proposed remedy;"[123] a designation of "points of compliance;"[124] an identification of the "design standards and technical specification for the design of the proposed remedy;"[125] an explanation of "any pre-operational staging or construction requirements;"[126] a "plan for the management and disposal of any products or by-products;"[127] a "contingency plan;"[128] an "operating log;"[129] a "description of the security procedures proposed to prevent unknowing access;"[130] "the procedures required to shut-down and close the remedial units;"[131] a "methodology for providing notice to the general public" and "specific plans and implementation procedures;"[132] a "compliance determination;"[133] and "certification requirements."[134] Notably, the RAWP must also "outline any proposed post-closure activities, including monitoring and/or institutional control restricting future land usage at the contaminated-side."[135]

Once a RAWP has been approved, the remedial action may commence. The remedial action must comply with the requirements of § 11.00 of the Remediation Regulations. Additionally, RIDEM "*may* require, based on site-specific information, implementation of certain closure requirements outline in § 2.1.09 (Closure and Post-Closure Plans and Financial

[121] Remediation Regulations, *supra* note 111, at § 9.07.
[122] *Id*. at § 9.09.
[123] *Id*. at § 9.08.
[124] *Id*. at § 9.06 (Points of compliance are "locations where hazardous substances will be measured in order to determine if the remedial objectives have been met.").
[125] *Id.* at § 9.10 (Including "A) Identification of the materials of construction of all portions of the remedy; B) The type of equipment to be used, including unit capacity and dimensions; C) The results of any laboratory or pilot-scale tests conducted to determine the effectiveness of the proposed Remedial Action; and D) Any manufacturer's literature and/or technical guidance documents on the construction, implementation and/or operation of proposed units.").
[126] *Id*. at § 9.11.
[127] *Id*. at § 9.12.
[128] *Id*. at § 9.13.
[129] *Id*. at § 9.14.
[130] *Id*. at § 9.15.
[131] *Id*. at § 9.16.
[132] *Id*. at § 9.17.
[133] *Id*. at § 9.18.
[134] *Id*. at § 9.19.
[135] *Id*. at § 9.16.

Assurance) of the Solid Waste Regulations as necessary to protect human health and the environment."[136] Last, a Letter of Compliance or Interim Letter of Compliance will be issued to the Responsible Party when a Rhode Island-registered professional engineer certifies "that the landfill has been properly remediated and closed in accordance with the approved" RAWP.[137] The landfill owner has a continuing obligation to comply with the post-closure monitoring requirements of the Solid Waste Regulations.[138]

5. D. Development Phase

Once a landfill owner has a Certificate of Closure, installation may commence provided that post-closure and monitoring requirements of the Solid Waste Regulations are met and the RIDEM garners approval for the installation plans pursuant to the conservation easement (as discussed above). This section will discuss considerations pertinent to the development phase after the landfill has been closed.

5. D. 1. Post-Closure Care

After the landfill has been formally closed, RIDEM's post-closure care regulations outline the remaining obligations of the landfill owner. Pursuant to the Solid Waste Regulation Rule 2.1.09(b) and 2.1.09(c), the post-closure care includes the following: maintaining drainage control structures; maintaining soil cover integrity, slopes, cover vegetation and gas venting structures; maintaining the leachate collection and disposal system; and "proper maintenance of all facility components to maintain the facility and meet the requirements of this rule for a minimum period of 30 years after landfill closure."[139] The landfill owner should take care to set

[136] RIDEM Closure Policy, *supra* note 81, at p. 4.
[137] *Id*. at p. 5. ("A Letter of Compliance will be issued if there are no groundwater objective exceedances in accordance with the Remediation Regulations, whereas, an Interim Letter of Compliance will be issued if groundwater objective exceedances exist at the site.").
[138] RIDEM Closure Policy, *supra* note 81, at p. 7.
[139] Solid Waste Regulations, *supra* note 103, at 2.1.09(b) and 2.1.09(c).

forth provisions, either in the development agreement or the lease with a potential developer, to ensure continued compliance with the post-closure care regulations.

5. D. 2. Contracts

5. D. 2. a. Development Agreement

A development agreement is a bilateral contract between a landfill owner, usually a municipality, and a developer that is "executed as part of the development approval process."[140] It is a flexible, mutually-beneficial tool that allows both the city and the developer to secure specifically-tailored rights and benefits. The development agreement can offer stability and certainty to the process of siting a solar project on a landfill. Specifically, a developer may be able to negotiate for a "vested right" which provides a "'freeze period' during which conflicting laws and regulations enacted after project approval will not affect the approved development."[141] A vested right protects the developer's ability to invest capital and begin the project which "cannot be taken away without due process."[142] The municipality, in exchange, receives a contractually-binding promise from the developer to "abide by a defined set of conditions restricting the use of the property."[143] Further, the municipality in addition to gaining certainty in the development process, which decreases the cost to the public, development agreements offer a way to "achieve long-range comprehensive planning goals."[144] For an example of a development agreement see Appendix III (Development Agreement for the Forbes Street Redevelopment Project).

5. D. 2. b. Avoiding Contract Zoning

[140] Brad K. Schwartz, *Development Agreements: Contracting for Vested Rights*, 28 B.C. ENVTL. AFF. L. REV. 719, 726 (2001).
[141] *Id.* at 727.
[142] *Schwartz* at 721. For more on development agreements: *See* Robert M. Kessler, *The Development Agreement and Its Use in Resolving Large Scale, Multi-Party Development Problems: A Look at the Tool and Suggestions for its Application*, 1 J. LAND USE & ENVTL. L. 451, 456 (1985).
[143] *Schwartz* at 726.
[144] *Id.* at 727-728.

Contract zoning, an "ad hoc agreement between a municipality and a developer," is "illegal whenever it arises from a promise by a municipality to zone property in a certain manner, whether in a bilateral contract or unilateral contract initiated by the municipality."[145] As stated above, a development agreement is a bilateral contract and thus, "absent legislative authority," such an agreement, is susceptible to the per se invalidity of contract zoning.[146] The reasoning is that when a municipality promises to rezone property in a bilateral contract, it essentially "bypasses the notice and hearing phases of the legislative process, thereby depriving interested parties of due process."[147] A unilateral contract, however, where a developer unilaterally "makes a promise contingent on the municipality's act of rezoning" may be legal because the municipality is not promising to rezone and thus, it does not implicate the same due process concerns mentioned above.[148] In this respect, a unilateral contract is more aptly referred to as "conditional zoning" because it "describes the situation in which a municipality rezones on a condition that a [developer] perform a certain act prior to, simultaneously with, or after the rezoning."[149]

5. D. 2. c. Solar Power Purchase Agreement

A "Solar Power Purchase Agreement" (SPPA) is a financial agreement "in which a third-party developer owns, operates, and maintains the photovoltaic (PV) system, and a host customer," such as the municipality, "agrees to site the system" on the landfill.[150] The municipality "purchases the system's electric output … for a predetermined period."[151] This

[145] *Schwartz* at 728.
[146] *Id.* at 728.
[147] *Id.*
[148] *Id.*
[149] *Dacy v. Ruidoso*, 845 P.2d 793, 797 (N.M. 1992).
[150] U.S. EPA Solar Power Purchase Agreements, http://www.epa.gov/greenpower/buygp/solarpower.htm (last accessed Nov. 26, 2011).
[151] *Id*.

business model is beneficial for the municipality because it allows for a stable flow of electricity, sometimes at a lower cost.[152]

5. D. 2. d. Resale Power Purchase Agreement

Another type of PPA is typically established between the landfill owner, the municipality, and the regulated utility company, such as National Grid.[153] In this context, the city is the reseller and National Grid is the buyer. The terms of the resale PPA, often coined a "back-to back" PPA, will typically track the terms of the SPPA "because the [city] will not want to promise more than it has the right to deliver."[154] In Rhode Island, the PPAs are governed by state law and are subject to approval by the Commission.[155] As discussed in the net-metering and long-term contracting sections above, the energy price, REC, and capacity price negotiated must be "commercially reasonable."[156]

5. D. 2. e. Relevant Legal Considerations in a PPA

Commercial Operation Date

The date the PPA is signed and becomes binding is typically known as the "effective date."[157] The length of the term is not necessarily defined by the "effective date," but rather the "commercial operation date," thus it is important to define this date carefully taking into consideration pending permit approvals, installation or interconnection issues, as well as finalization of other contracts.[158] In some instances, the "commercial operation date" may be "defined in a manner that allows the project owner to achieve commercial operation even if it has

[152] U.S. EPA Solar Power Purchase Agreements, *supra* note 150.
[153] John M. Erikson, William H Holmes, *The Law of Wind: Power Purchase Agreements and Environmental Attributes*, http://www.agmrc.org/media/cms/WindPowerPurchaseAgreements_E4AEB5E96D0B5.pdf#P (last accessed Nov. 28, 2011).
[154] *Id.* at p 2.
[155] *See* R.I. Gen. Laws, *supra* note 43 at § 39-26-1-3(b).
[156] *Id.* at § 39-26-1-3.
[157] *The Law of Wind*, *supra* note 153, at p. 4.
[158] *Id.*

installed" less than the agreed upon number of installations. For example, the PPA may call for a total installed capacity of 10 MW, but the "commercial operation date" may occur when 7 MW is installed.[159] Here, the PPA will likely require the seller to continue building until the total installed capacity is met, but the seller can hold the buyer liable for "liquidated damages" if the seller fails to complete the project.[160]

Termination

The PPA may provide for termination by the parties "if certain events occur or fail to occur."[161] Early termination may occur, for example, if: (1) the Commission fails to approve the PPA; (2) "an interconnection agreement or needed transmission rights" cannot be obtained; (3) certain "land rights required to build the project" cannot be obtained, e.g. solar easements; (4) permits are not approved; (5) the project fails "to reach a certain minimum size by a certain date;" or (6) the project fails "to achieve commercial operation by a certain date."[162] Before termination may be invoked, however, a party must first "use diligent or reasonable efforts" to meet their respective obligations as outlined in the PPA (e.g., a seller may not invoke the termination provision due to an inability to obtain a permit, "unless the seller had used diligent efforts to obtain the permit.")[163]

5. D. 3. Zoning

Certain municipal land use laws may create hurdles for the development and installation of a solar project on a landfill and thus, discourage investors.[164] For example, certain land use laws may prohibit the installation of a solar project on a landfill as a "nonpermitted use" or it

[159] *The Law of Wind*, *supra* note 153, at p. 4..
[160] *Id*.
[161] *Id*.
[162] *Id*.
[163] *Id*.
[164] *See* Michael L. Pisauro Jr., *Renewables And Land Use Law*, 23 NAT. RESOURCES & ENV'T 39, 40 (2008).

simply may not address the possibility of siting and managing a solar installation at all.[165] Similarly, zoning restrictions may slow the project development and increase costs by requiring the developer to seek permits, special permissions, or variances.[166] For an example of an ad hoc municipal zoning provision, see Appendix II (City of East Providence September 2011 Zoning Ordinance Amendment for the Forbes Street Landfill Solar Project).[167]

Solar land use laws, if implemented correctly, can preemptively address siting issues and clear a path for efficient renewable energy development. Two issues specific issues, which can be anticipated and remedied, include (1) existing municipal panel screening and aesthetic requirements and (2) ineffective land use laws which fail to protect the solar project from future "incompatible uses by neighbors."[168] A solar installation may "be subject to requirements that they be screened or invisible from the street, potentially impacting the actual effectiveness of the solar panels." To address the first issue, if a screening requirement exists, a municipality can remove this impediment as it applies to the landfill specifically. To address the second issue, municipalities can utilize solar access laws to prevent future neighboring development that may block the sun's energy.

Solar access laws may be implemented at the municipal or state level to protect the right to install and operate a solar project on a landfill.[169] A solar easement is a common type of state-level solar access law that allows a developer to secure access rights to sunlight from neighboring properties that may "be developed in such a way (e.g., building, foliage) as to restrict the system's access to sunlight."[170] The purchase of a solar easement can be costly and

[165] Pisauro, *supra* note 164, at 41.
[166] *Id*. at 41.
[167] Ordinance In Amendment Of Chapter 19 Of The Revised Ordinances Of The City Of East Providence, Rhode Island, 1998 (amended Sept. 6, 2011).
[168] Pisauro, *supra* note 164, at 51.
[169] *See* DSIRE Solar Policy Guide, http://www.dsireusa.org/solar/solarpolicyguide/, (last accessed Nov. 28, 2011).
[170] *Id*. at 80.

time consuming because it "requires negotiation with the … land owners," "retention of a lawyer to draft and record the easement[,] and a surveyor to plot out the easement."[171]

Rhode Island's voluntary approach allows property owners to grant solar easements "in the same manner and with the same effect as a conveyance of an interest in real property."[172] Absent any terms or conditions to the contrary, the solar easement would transfer automatically if either of the properties were transferred.[173] In Rhode Island, a solar easement must include four key provisions: (1) description of the property subject to and benefiting from the easement; (2) "description of the vertical and horizontal angles" where the solar easement extends over the burdened property; (3) "any terms and/or conditions under which the solar easement is granted or may be terminated;" and (4) any terms for compensation of the benefitted owner "in the event of interference with the enjoyment of the provisions of the solar easement, or any provisions for compensation of the owner of the property subject to the solar easement for maintaining the easement."[174] Furthermore, Rhode Island zoning ordinances should address, "through reasonable objective standards and criteria," appropriate provisions for "access to air and light, views, and solar access."[175]

Rhode Island's voluntary solar easement offers one form of protection for existing and future solar projects. Another approach would be to allow the project owner to claim an enforceable "solar right."[176] This would place the burden on the adjacent landowners to contest the claimed right. An even more progressive solar right law, however, might endeavor to reduce

[171] Pisauro, *supra* note 164, at 51
[172] R.I. Gen Laws, *supra* note 43, at § 34-40-2(a).
[173] *Id*.
[174] *Id*. at § 34-40-2(b).
[175] *Id*. at § 45-24-33(a), § 45-24-33(a)(4)(iv).
[176] *See* New Mexico's Solar Rights Act, N.M. Gen. Laws § 544–46 (codified at N.M. STAT. § 47-3-1 to -5 (1978)).

the restrictions that local ordinances or homeowner associations can place on the installation, building, or operation of a solar project on a landfill or brownfield.[177]

6. Solar Projects on Landfills in Rhode Island

The RIEDC has recognized the importance of renewable energy development in municipalities and communities, where local zoning and public policy can be effectively developed to benefit production of renewable energy. In RIEDC's long-term strategic plan, it states its intention to "work with municipalities and communities and to be a financial resource for them as they pursue renewable energy projects."[178]

6. A. The City of East Providence Forbes Street Landfill Solar Project

In the City of East Providence, according to the "East Providence Comprehensive Plan Update 2010-2015" the use of renewable energy sources and energy efficiency are top priorities.[179] In addition to the formation of a "City Energy Committee," tasked with "achiev[ing] greater energy efficiency" and "pursu[ing] outside funding for projects that will realize long-term energy savings," small-scale solar production has been identified as a "practicable and realistic use of solar energy in East Providence over the coming decade."[180] East Providence, in its "Community Sustainability Goals and Objectives," specifically identified the Forbes Street Landfill as a potential site for "renewable energy related uses," created an objective to "establish zoning provisions for the development and installation of renewable energy facilities," and assigned responsibility to the City Council and the Planning

[177] *See* DSIRE Solar Policy Guide, *supra* note 169, at p. 83 (Including "key elements in an effective solar rights law."). For an example see California's "Solar Rights Act" CA Civil Code § 714 et seq.
[178] *See* R.I. Renewable Energy Development Fund 5 – Year Strategic Plan, p.3, January 1, 2009, http://www.riedc.com/files/REF-Strategic-Plan.pdf (last accessed Oct. 23, 2011).
[179] East Providence Comprehensive Plan Update 2010-2015, p. 143, (adopted by East Providence City Council on January 5, 2010), http://www.eastprovidenceri.net/filestorage/662/684/698/Final_Comp_Plan_Update_to_SPP_March_2010.pdf. (last accessed Nov. 28, 2011).
[180] *Id.*

Department.[181] As a result, the City of East Providence is in the predevelopment phase of a 15 MW utility-scale solar project on the Forbes Street Landfill, a 70-acre, municipal landfill.

The city unanimously chose CME-OCI Solar Power LLC to close the landfill and develop the solar installation.[182] To date, the Forbes Street Landfill Solar Project has received $40,000 from the Rhode Island Foundation (December 2010), $85,000 from an Energy Efficiency Block Grant, a $200,000 recoverable grant from the RIREF (March 2011), and $100,000 for predevelopment expenses from RIEDC (October 2011).[183] As of August 31, 2011, the city anticipates completion of the landfill closure process and phase one construction of a 5 MW solar array by 2012.[184] In addition to potentially being the largest solar installation in the Northeast and offsetting the utility expense of East Providence, it will make productive use of land that has been fallow since 1980.[185]

6. B. The City of Westerly Landfill Solar Project

The Town of Westerly, in collaboration with the Washington County Regional Planning Council (WCRPC), is on the path towards siting a solar project on their closed and capped landfill.[186] Westerly received $22,000 "to complete the interconnect studies for potential renewable energy projects at the Westerly Landfill" as well as a $750,000 grant.[187] The proposed solar project would provide up to 2 MW, but "won't be sold to consumers; instead, it

[181] East Providence Comprehensive Plan Update, *supra* note 179, at 153.
[182] Neighborhood March 14, 2011 Meeting Forbes Street Solar Project, http://www.eastprovidenceri.net/filestorage/666/738/746/778/March_14_Forbes_Street_solar_facility_meeting_presentation.pdf (last accessed Nov. 28, 2011).
[183] *EDC awards $2.7M in renewable energy grants*, Providence Business News, Oct 27, 2011; *RI offers grant for East Providence solar farm*, Boston.com, Mar. 29, 2011; Conversation with Jeanne Boyle, East Providence City Planner (Nov. 4th, 2011, 11:00:00 EST) (on file with author).
[184] Public meeting: Status of Environmental & Neighborhood Drainage Assessment, Proposed Solar Project Forbes Street Landfill East Providence (August 31, 2011) (on file with author).
[185] *EDC awards $2.7M in renewable energy grants*, *supra* note 174.
[186] *Huge Solar Project Received Funding*, Providence Business News, Apr. 12, 2010.
[187] *Id.*

will be used to reduce the amount of energy the town purchases each year."[188] The company from Middletown, Rhode Island, rTerra, selected by the Westerly Town Council to develop a solar panel array, plans to construct the project at no cost and make annual lease payments of "at least $20,000" to the town.[189]

7. Conclusion

Although the development of solar energy installations on contaminated lands is just beginning to gain momentum across the Nation, the impetus towards revitalization of dormant landfills in Rhode Island is clear. State government agencies, such as the Rhode Island Department of Environmental Management and Economic Development Corporation, are strong proponents of the concept. Additionally, the trend in favorable state laws, such as the Interconnection Standard (see Section 4. B. 2), Net Metering law (See Section 4. B. 3.) and Long-Term Contracting Standard (See Section 4. B. 4.), are key examples of legislation that will promote the development of renewable energy. Therefore, Rhode Island landfills are uniquely situated for efficient solar development.

[188] *Huge Solar Project Received Funding*, supra note 186.
[189] *2 firms favored by council for green energy*, The Westerly Sun, Nov. 8, 2011.

APPENDIX I.

DEFINITIONS

Brownfield site means "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."[190] It does not include, among other things, "a facility that is listed on the National Priorities List or is proposed for listing."[191]

Comprehensive Environmental Response, Compensation, and Liability Act "authorizes EPA to clean up uncontrolled or abandoned hazardous waste sites and respond to accidents, spills and other emergency releases of hazardous substances. CERCLA provides EPA with enforcement authority to ensure that responsible parties pay the cleanup costs of remediating a site contaminated with hazardous substances."[192]

Comprehensive Environmental Response, Compensation, and Liability Information System is a "computerized database used to track hazardous substance sites."[193]

Distributed generation refers to "[s]mall, modular, decentralized, grid- connected, or off-grid energy systems located in or near the place where energy is used."[194]

Feed-in Tarriff is "a policy that requires utilities to pay a fixed, premium rate for renewable energy generation guaranteed for a set time period."[195]

Interconnection Standards "specify the technical and procedural process by which a customer connects an electricity-generating system to the grid. Interconnection standards include the technical and contractual arrangements that system owners and utilities must abide by."[196]

Investment Tax Credit (ITC) is "a federal tax credit based on a percentage of a taxpayer's investment in qualifying energy property. For example, if the taxpayer's investment in qualifying energy property is $100 and the credit rate is 30%, the amount of the ITC is $30."[197]

Landfill (Sanitary Landfill), also known as a MSWLF (as defined below), is "a licensed land disposal site employing an engineered method of disposal of solid waste in a manner that absolutely minimizes environmental hazards, including: spreading the solid waste in thin layers,

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[190] Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9601-9675, 9601(39)(A) (as amended by Public Law 107-118 (H.R. 2869)) (2002).
[191] *Id*. at 42 U.S.C. 9601(39)(B)(ii).
[192] EPA Hazardous Waste Website, Glossary, Appendix D http://www.epa.gov/osw/hazard/wastetypes/pdfs/appd.pdf (last accessed Nov. 27, 2011).
[193] *Id*.
[194] US EPA Guide to Purchasing Green Power, p. 40, http://www.epa.gov/greenpower/documents/purchasing_guide_for_web.pdf (last accessed Nov. 27, 2011).
[195] Glossary of Terms, Solar EOS. http://solar-eos.com/?page_id=972. (last accessed Nov. 8, 2011).
[196] *Id*.
[197] *Id*.

compacting the solid waste to the smallest practical volume; and applying cover material at the end of each operating day, or at such more frequent intervals as may be necessary."[198]

Municipal Solid Waste includes "durable goods (e.g., appliances, tires, batteries), nondurable goods (e.g., newspapers, books, magazines), containers and packaging, food wastes, yard trimmings, and miscellaneous organic wastes from residential, commercial, and industrial nonprocess sources."[199]

Municipal solid waste landfill (MSWLF) unit "means a discrete area of land or an excavation that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile. A MSWLF unit also may receive other types of RCRA Subtitle D wastes, such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste and industrial solid waste."[200]

National Priorities List is a list of EPA's priority hazardous substance sites for cleanup. EPA only funds remedial actions at hazardous waste sites on the NPL.[201]

Net Metering, in Rhode Island, "means using electricity generated by an eligible net metering system for the purpose of self-supplying power at the eligible net metering system site and thereby offsetting consumption at the eligible net metering system site through the netting process established in [Title 39 Chapter 26.4-2]."[202]

Post-Closure is the "period after closure during which owners and operators of solid or hazardous waste disposal units conduct monitoring and maintenance activities in order to preserve the integrity of the disposal system."[203]

Power Purchase Agreement (PPA) is "a legal contract in which a power purchaser purchases the energy produced, and sometimes the capacity and/or additional services, from an electricity generator."[204]

Production Tax Credit (PTC) is "a federal tax credit based on the per kWh of electricity sold by a taxpayer from a qualifying facility to an unrelated entity."[205]

Public Benefits Fund (PBF), or clean energy funds, is "typically created by levying a small fee or surcharge on electricity rates paid by customers (i.e., system benefits charge [SBC]). The resulting funds can be used to support clean energy supply (i.e., renewable energy, energy

[198] Solid Waste Regulations, *supra* note 103, at § 1.3.00.
[199] *Id.*
[200] 40 C.F.R. § 258.2 (LexisNexis 2011).
[201] *Id.*
[202] R.I. S. Res. 457, *supra* note 59.
[203] U.S. EPA, Introduction to Closure/Post-Closure, http://www.epa.gov/wastes/inforesources/pubs/training/close05.pdf, (last accessed Nov. 30, 2011).
[204] Glossary of Terms, Solar EOS, *supra* note 195.
[205] *See* DSIRE Solar Policy Guide, *supra* note 169.

efficiency, and combined heat and power [CHP]).”[206]

“**Renewable Energy**” are “[e]nergy resources that are naturally replenishing but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Renewable energy resources include: biomass, hydro, geothermal, solar, wind, ocean thermal, wave action, and tidal action.”[207]

Renewable Energy Credits (RECs) are “tradable certificates representing electricity generated from renewable resources. Renewable energy projects create two products with value: 1) the electricity generated, which can be sold to utilities and consumers; and 2) RECs, which often represent the avoided emission of greenhouse gases (GHGs), and can be sold, traded or bartered. Utilities and other parties may purchase RECs from renewable power generators to comply with state requirements or voluntary green power standards.”[208]

“Renewable Energy Resources,” in Rhode Island, are “(1) Direct solar radiation; (2) The wind; (3) Movement or the latent heat of the ocean; (4) The heat of the earth; (5) Small hydro facilities; (6) Biomass facilities using eligible biomass fuels and maintaining compliance with current air permits; eligible biomass fuels may be co-fired with fossil fuels, provided that only the renewable energy fraction of production from multi-fuel facilities shall be considered eligible.”[209]

Renewable Portfolio Standard (RPS) “is a state policy that requires electricity providers to obtain a minimum percentage of their power from renewable energy resources by a certain date.”[210]

Remedy or Remedial Action means “those actions taken to rectify the effects of a release of hazardous material, so that it does not cause a significant risk to present or future public health or welfare, or the environment.”[211]

"**Solar easement**,” is “a right, whether or not stated in the form of restriction, easement, covenant, or conditions in any deed, will, or other instrument executed by or on behalf of any owner of land or solar skyspace for the purpose of ensuring adequate exposure of a solar energy system as defined in § 44-39-1(b)(1).”[212]

"**Solar skyspace**,” is “the space between a solar energy system and the sun which must remain unobstructed such that on any given clear day of the year, not more than ten percent (10%) of the collectible insolation shall be blocked.”[213]

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[206] U.S. EPA State and Local Climate Change and Energy Program, Glossary, http://www.epa.gov/statelocalclimate/resources/glossary.html (last accessed Nov. 30, 2011).
[207] U.S. Energy Information Administration, Methodology for Allocating Municipal Solid Waste, http://www.eia.doe.gov/cneaf/ solar.renewables/page/mswaste/msw_report.html (last accessed Nov. 8, 2011).
[208] U.S. EPA Siting Renewable Energy on Potentially Contaminated Land and Mine Sites, *supra* note 29.
[209] R.I. Gen. Laws, *supra* note 43, at § 39-26-5.
[210] U.S. EPA Siting Renewable Energy on Potentially Contaminated Land and Mine Sites, *supra* note 29.
[211] Remediation Regulations, *supra* note 111, at § 3.67.
[212] R.I. Gen. Laws, *supra* note 43, at § 34-40-1(1)
[213] *Id.* at § 34-40-1(2)

Superfund "refers to the entire CERCLA program as well as the trust fund established to fund cleanup of contaminated sites where potentially responsible parties cannot be identified, or are unwilling or unable to pay."[214]

Superfund Amendments and Reauthorization Act SARA, enacted in 1986, reauthorized and amended CERCLA to include additional enforcement authorities, technical requirements, community involvement requirements, and various clarifications. SARA Title III authorized EPCRA.[215]

[214] EPA Hazardous Waste Website, Glossary, Appendix D, *supra* note 183.
[215] *Id*.