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Corporate Energy Responsibility: International and Domestic Perspectives on Supply and Demand in the New Millenium

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CORPORATE ENERGY RESPONSIBILITY: INTERNATIONAL AND DOMESTIC PERSPECTIVES ON SUPPLY AND DEMAND IN THE NEW MILLENIUM

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I. CORPORATE SOCIAL RESPONSIBILITY AND ENERGY THROUGH DOMESTIC AND INTERNATIONAL PERSPECTIVES

Energy and corporate responsibility. Energy is the core technology undergirding all developed country economies. Corporations are key players converting the world's natural resources to energy and power. This symposium addresses the relationship between corporate social responsibility and initiatives that impact the future of sustainability at national and international levels. Corporate social responsibility is a somewhat amorphous and evolving concept.[1] It includes: corporate investment in renewable energy, and the linkage between carbon emissions and climate change.

Electricity production accounts for less than five percent of U.S. economic activity, yet is held responsible for about one-quarter of

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1. *See generally* Steven Ferrey, *The New Climate Metric: The Sustainable Corporation and Energy*, 46 WAKE FOREST L. REV. 383, 383 (2011).

emissions of certain criteria air pollutants.[2] While much pollution from energy use is more local and regional, the impacts on climate change are global. Power derived from burning gaseous, liquid, and solid fossil fuels to create electric power releases copious quantities of CO_2 into the environment.[3] Fossil fuel generation results in sixty-four percent of total human-made atmospheric CO_2, and this amount has increased significantly since 1990.[4] Electric power demand is continuing to increase dramatically.[5] The share of fossil fuels converted to create electricity increased over the last century from less than one percent in 1900 to twenty-five percent in 1990.[6]

GHG annual emissions increased about seventy percent between 1970 and 2004, with the combustion of fossil fuels accounting for seventy percent of GHG emissions, electric power generation responsible for forty percent of these CO_2 emissions, and coal-fired electric power generation accounting for about seventy percent of the

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2. *See Air Emissions*, EPA, http://www.epa.gov/cleanenergy/energy-and-you/affect/air-emissions.html (last updated Sept. 25, 2013). According to the Environmental Protection Agency, "[f]ossil fuel-fired power plants are responsible for [sixty-seven] percent of the nation's sulfur dioxide emissions, [twenty-three] percent of nitrogen oxide emissions, and [forty] percent of man-made carbon dioxide emissions." *Id.*

3. The amount of carbon released per unit of usable energy decreased each time as human populations moved from wood to coal as the dominant CO_2-releasing fuel; first in the late nineteenth century, again in the mid-twentieth century when there was a movement from coal to oil, and in the future when we move toward natural gas. *See* STEVEN FERREY, UNLOCKING THE GLOBAL WARMING TOOLBOX: KEY CHOICES FOR CARBON RESTRICTION AND SEQUESTRATION 27–28, Figure 3–1 (2010) [hereinafter FERREY, UNLOCKING THE GLOBAL WARMING TOOLBOX]; STEVEN FERREY; LAW OF INDEPENDENT POWER § 2.1 (30th ed. 2013) [hereinafter FERREY, LAW OF INDEPENDENT POWER].

4. ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, REPORT NO. DOE/EIA-0573(2005/ES), EMISSIONS OF GREENHOUSE GASES IN THE UNITED STATES 2005: EXECUTIVE SUMMARY 2–3 (2007), http://www.eia.doe.gov/oiaf/1605/ggrpt/summary/pdf/0573(2005)es.pdf; *Frequently Asked Global Change Questions*, CARBON DIOXIDE INFO. ANALYSIS CTR., http://cdiac.ornl.gov/faq.html (last updated Aug. 26, 2013).

5. *See, e.g.*, INT'L ENERGY AGENCY, WORLD ENERGY OUTLOOK 2004, 191–223 (2004), http://www.worldenergyoutlook.org/media/weowebsite/2008-1994/weo2004.pdf.

6. Steven Ferrey, *Power Future*, 15 DUKE ENVTL. L. & POL'Y F. 261, 267 (2005).

emissions in this sector.[7] Global energy-related emissions are expected to increase fifty-seven percent from 2005 to 2030.[8] At current rates of energy development, energy-related CO_2 emissions in 2050 would be 200% of their current levels under the existent pattern.[9] Chief NASA climatologist James Hansen notes that merely waiting until 2018 to stop the "growth of greenhouse gas emissions" reduces the probability to near no chance to avoid catastrophic effects of warming.[10] A report[11] forecasts three key energy-related responsible goals: reducing GHG emissions by up to eighty percent; less emphasis on fossil fuel generation of electricity; greater implementation of smart grid and energy efficiency technologies.

It has been estimated that a $10 trillion expenditure in renewable resources will be required over the next two decades just to limit the rise in Earth temperature.[12] This is equal to 0.5–1.1% of global GDP.[13] Investment capital flowing into renewable energy worldwide

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7. Joëlle de Sépibus, *The Liberalisation of the Power Industry in the European Union and its Impact on Climate Change: A Legal Analysis of the Internal Market in Electricity* 2–4 (Swiss Nat'l Ctr. of Competence in Res., Working Paper No. 2008/10, 2008), *available at* http://phase1.nccr-trade.org/images/stories/Brown%20Bags/de20Sepibus_EU20lib20CC—final.pdf.

8. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, INTERNATIONAL CLIMATE CHANGE PROGRAMS: LESSONS LEARNED FROM THE EUROPEAN UNION'S EMISSIONS TRADING SCHEME AND THE KYOTO PROTOCOL'S CLEAN DEVELOPMENT MECHANISM 48 (2008), http://www.gao.gov/assets/290/283397.pdf.

9. WILLIAM C. RAMSAY, DEPUTY EXECUTIVE DIRECTOR, INT'L ENERGY AGENCY, ENERGY TECHNOLOGY PERSPECTIVES: SCENARIOS AND STRATEGIES TO 2050, PRESS CONFERENCE AT OECD TOKYO CENTER (July 14, 2006), *available at* http://www.unece.lsu.edu/biofuels/documents/2007July/SRN_020.pdf.

10. Robin Chase, Op-Ed., *Get Real on Global Warming Goals*, BOS. GLOBE, Apr. 22, 2008, at A15; *see generally* Jim Hansen, *The Threat to the Planet*, N.Y. REV. BOOKS, July 13, 2006, http://www.nybooks.com/articles/archives/2006/jul/13/the-threat-to-the-planet; James Hansen et al., *Global Temperature Change*, 103 PROC. NAT'L ACAD. SCI. 14288 (2006).

11. *See* FORREST SMALL & LISA FRANTZIS, NAVIGANT CONSULTING, THE 21ST CENTURY ELECTRIC UTILITY: POSITIONING FOR A LOW-CARBON FUTURE, at iv (2010).

12. *IEA's $10 trillion Climate Price Tag*, ELECTRICITY J., Dec. 2009, at 1. It might achieve about as much in saved energy acquisition costs—$8.6 trillion by 2030. *Id.*

13. *Id.*

climbed from $80 billion in 2005 to $100 billion in 2006.[14] This is still an order of magnitude lower than estimated requirements. The International Energy Agency predicts that by 2030, world demand for energy will grow by almost sixty percent, and fossil fuel sources will still supply eighty-two percent of the total, with non-carbon renewable energy sources supplying only six percent.[15]

CSR is often equated with sustainable development, which has been defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[16] Ceres[17] foresees that socially responsible sustainable corporations will: manage carbon reductions "across the enterprise;" pursue all cost-effective energy efficiency; and integrate cost-effective renewable energy resources.

CSR remains in focus. I had the opportunity to address corporate social responsibility related to energy at in 2005 at William and Marry Law School, in 2008 at Boston College, and in 2011 at Wake Forest Law School. This paper will focus on the international supply of energy and CSR in a fast-developing world economy. Energy CSR is an issue of energy demand domestically and energy supply internationally. CSR for corporations in the United States is a question of controlling their demand for energy. This article in Part II starts with the international arena and describes the CSR blueprint to

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14. Press Release, U.N. Env't Programme, Investors Flock to Renewable Energy and Efficiency Technologies: Climate Change Worries, High Oil Prices and Government Help Top Factors Fueling Hot Renewable Energy Investment Climate, (June 20, 2007), http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=512&ArticleID=5616&l=en.

15. INT'L ENERGY AGENCY, *supra* note 5, at 34, 57. This assumes the current scenario with an absence of new regulatory renewable energy incentives or programs to change the current trajectory. *Id.* at 29. According to the EPA, the purpose of this new rule is to collect accurate and timely data to inform future policy decisions. *Id.* at 32.

16. U.N., WORLD COMMISSION ON ENV'T AND DEV., OUR COMMON FUTURE 43 (1987).

17. FORREST SMALL & LISA FRANTZIS, NAVIGANT CONSULTING, THE 21ST CENTURY ELECTRIC UTILITY: POSITIONING FOR A LOW-CARBON FUTURE, at vi–vii (2010), https://www.ceres.org/resources/reports/the-21st-century-electric-utility-positioning-for-a-low-carbon-future-1. Also included in the report are "Incorporate Smart Grid technologies for consumer and environmental benefit" and "Conduct robust and transparent resource planning." *Id.*

address exploding demand for and supply of energy in developing countries. Parts III and IV look at issues in a domestic context: Part III looks at CSR implemented through the National Environmental Policy Act (NEPA) and building energy use standards. Part IV examines existing federal and state incentives for energy CSR and the cross subsidies and legal challenges which result.

II. ENERGY EQUITY IN THE INTERNATIONAL CONTEXT

A. Electricity, Development, and Climate

This symposium looks at both domestic and international implications of energy and equity. And there is endless opportunity to discuss international aspects of energy in or outside of the energy context. On December 7, 2012, the anniversary of "Pearl Harbor Day," Jim Yong Kim, the President of the World Bank, stated that it was essential that developing nations increase access to electric power in order to develop and eradicate poverty.[18] He noted that over the past five years, the World Bank had shifted its funding priorities to doubling the funding of renewable energy alternatives in lieu of funding fossil-fuel-fired large electric power generation facilities.[19]

This statement of Mr. Kim highlights three realities: First, electric power access and supply has become the metric of equitable resource access in a global context. Second, there is an inexorable pursuit of more electric power supply in developing nations. Third, there are alternatives to electric power supply. Renewable and lower carbon emitting electric power supply resources are technologically available and viable alternatives. The challenges are the legal, financial, and regulatory mechanisms needed to implement them.

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18. "But we are focused on poverty. And in places like Africa, where the need for electricity is just desperate, you cannot lift people out of poverty without energy. We have to balance our responsibility to help countries improve their energy supply with this absolute need to do more around renewables." *World Bank Issues Alarming Climate Report* (NPR radio broadcast, Dec. 7, 2012), *available at* http://www.npr.org/2012/12/07/166713194/world-bank-issues-alarming-climate-report?ft=1&f=3.

19. "[I]n 2007, some [twenty-two] percent of our projects in energy were focused on renewables. And by 2012, that number is [forty-four] percent, so we doubled in a five-year period, and that number will only grow over time." *Id.*

That same day, the World Bank released a report predicting global temperatures could rise by 7.2 degrees Fahrenheit by the end of the century or sooner if current commitments to curb emission are not realized.[20] CO_2 emissions grew 5.9% in 2010 reaching over nine billion tons and overshadowing a 1.4% decrease in CO_2 emissions in 2009.[21] The combustion of coal represented more than half of the growth in emissions.[22]

There were a series of climate change action pledges of financial support from developed nations to developing nations at the annual Kyoto Protocol COP meetings over a period of the past two decades. There were GHG reduction pledges made by developed countries at COP-3 forming the 1997 Kyoto Protocol, which now has 192 parties,[23] as well as at the 2007 Bali Conference of the Parties (COP-13),[24] the 2009 Copenhagen COP-15,[25] and at the 2010 Cancun COP-

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20. *Id.*

21. Justin Gillis, *Carbon Emissions Show Biggest Jump Ever Recorded*, N.Y. TIMES, Dec. 4, 2011, at A4.

22. *Id.*

23. *See Kyoto Protocol*, U.N. FRAMEWORK CONVENTION ON CLIMATE CHANGE, http://unfccc.int/kyoto_protocol/items/2830.php (last visited Nov. 14, 2013). The so-called Annex 1 countries agreed to reduce GHGs by an average of five percent below country 1990 levels between 2008–2012, with amounts varying by country. *Id.* The Protocol achieved enough ratification to come into force February 16, 2005. *Id.*

24. The Bali Roadmap and Bali Action Plan addressed mitigation, adaptation, technology and finance, with final resolution to be reached by 2009 at COP-15 in Copenhagen. *Summary of the DOHA Climate Change Conference: 26 November–8 December 2012*, EARTH NEGOTIATIONS BULL., Dec. 11, 2012, at 1–2, http://www.iisd.ca/download/pdf/enb12567e.pdf. COP is the Conference of the Parties to the Kyoto Protocol, an annual meeting to attempt to implement the goals of the Protocol. *See* Jessica Aldred, *Q&A: Bali Climate Change Conference*, THE GUARDIAN (Dec. 3, 2007, 12:05 PM), http://www.guardian.co.uk/environment/2007/nov/30/bali.climatechange; *Deal Agreed in Bali Climate Talks*, THE GUARDIAN (Dec. 15, 2007, 7:33 AM), http://www.guardian.co.uk/environment/2007/dec/15/bali.climatechange4; Conference of the Parties to the UNFCCC, Thirteenth Session, Bali, Indon., Dec. 3–15, 2007, *Part Two: Action Taken by the Conference of the Parties at its Thirteenth Session* 5, U.N. Doc. FCCC/CP/2007/6/Add.1 (Mar. 14, 2008), *available at* http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf.

25. *See* Conference of the Parties to the UNFCCC, Fifteenth Session, Copenhagen, Den., Dec. 7–19, 2009, *Decisions Adopted by the Conference of the Parties*, U.N. Doc. FCCC/CP/2009/11/Add.1 (Mar. 30, 2010), *available at*

16 where the "Cancun Agreements" were developed to try to limit GHG emissions to hold temperature rise to 1.5 degrees C.[26] There is also a new Green Climate Fund and standing committees designed to address the creation of this fund and the mechanisms in place to administer the fund (as well as a fast-start pledge),[27] and GHG reduction pledges were also made at the 2011 Durban COP-17 which reached some advance on the Green Climate Fund,[28] and at the 2012 Doha COP-18 which needed to adopt a second commitment period.[29]

At the 2012 Doha COP-18, countries raised issues regarding the provision of greater access to finance resources by developed countries for developing countries, new taxes on commerce to provide such funding, and Green Climate Fund replenishment for this fund, which will now be located in Sondgo, Korea.[30] While at the Copenhagen COP there was a $30 billion financing commitment of developed countries to finance developing country mitigation and adaption efforts by 2012 and a $100 billion annual commitment by 2020, there was no original agreed commitment for any funding during the gap between 2012 and 2020, and Doha did not reach any agreement on this gap.[31] Several key countries, including Japan, Canada, New Zealand, and Russian Federation, refused to take on commitments for the second commitment period beginning now in

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http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf. The Copenhagen Conference of the Parties (COP-15), which took place in December 2009, was intended to establish an ambitious global climate change agreement for the post-2012 period, when the Kyoto Protocol expires. The Conference only produced a thirteen-paragraph "political accord" which was not an official product of the meeting, and was only "noted" by the Conference because of lack of a consensus among world nations. *Id.* at 4–5. This comprises the regulatory fabric insulating the world against global warming.

26. *See COP 16: UN Conference Delegates Debate Source of Climate Change Funds*, HUFFINGTON POST (May 25, 2011, 7:15 PM), http://www.huffingtonpost.com/2010/12/08/cop-16-un-conference-dele_n_794094.html; *Summary of the DOHA Climate Change Conference*, *supra* note 24, at 2.

27. *See* WORLD RESEARCH. INST., SUMMARY OF DEVELOPED COUNTRY FAST-START CLIMATE FINANCE PLEDGES, http://pdf.wri.org/climate_finance_pledges_2010-10-27.pdf (last updated Oct. 27, 2010); *Summary of the DOHA Climate Change Conference*, *supra* note 24, at 2.

28. *Summary of the DOHA Climate Change Conference*, *supra* note 24, at 2.

29. *Id.* at 3.

30. *Id.* at 4–5, 27.

31. *Id.* at 28.

2013.[32] This leaves the Kyoto Protocol, as of today, applying its requirements to corporate emissions of only fifteen percent of world nation GHG emissions, and affecting developed countries whose emissions are not increasing significantly.[33]

Countries attending United Nations climate talks in Doha were not able to come up with any major agreements on reducing carbon emissions and slowing global warming. It remains unclear what will be the means of implementation of the Kyoto Protocol's core concept of "common but differentiated responsibilities" to address and arrest climate change. The Doha COP left thirty-seven parties with various "soft" pledges and inconsistent self-reporting of emissions progress under different baselines and accounting principles.[34] Some developing countries expressed the opinion at Doha of "deep disappointment" that finance mechanisms remained an "empty shell."[35]

The most recent world meetings at the 2011 Durban COP and 2012 Doha COP-18 delayed progress on climate change action and drifted into further negotiation during the 2012–2020 gap period between the first commitment period ending in 2013 and the 2020 Copenhagen pledges.[36] These fall far short of global requirements: global emissions need to be in the process of rapid reduction within four years (by 2018) in order to have any reasonable chance to avoid a climate catastrophe, according to some knowledgeable scientists.[37] Instead, emissions rose by 5.9% in 2010, the largest amount on record.[38] The international goal of an average eighteen percent reduction in 2020 from 1990 levels by Annex I countries is not nearly enough to avoid the "tipping point" of a maximum two degree

32. *Id.* at 26.

33. *Id.*

34. *Id.* at 27.

35. *Id.* at 6.

36. *Id.* at 26. This agreement set a negotiation target of 2015 for a new mechanism to come into effect by 2020. This substantially delayed progress originally expected during the 2012–2020 period.

37. James Hansen et al., *Target Atmospheric CO_2: Where Should Humanity Aim?*, 2 OPEN ATMOSPHERIC SCI J. 217, 229 (2008). Hansen notes that merely waiting until 2018 to stop the "growth of greenhouse gas emissions" may make it near impossible to avoid catastrophic effects of warming. Chase, *supra* note 10.

38. Gillis, *supra* note 21. This contrasts with a 1.4% drop in emissions in 2009. *Id.*

Celsius rise in global temperature.[39] The Kyoto Protocol first period ended at the end of 2012, and during the current second period, the plan now is to work towards a basis for a globally binding treaty and a working carbon market in by 2020[40]—significantly after a 2018 possible "tipping point." Amid a remarkable lack of progress, the debate will go on in annual cycles: The 2013 COP-19 will be held in Warsaw, and the 2014 COP-20 in Latin America and the Caribbean.[41]

B. International Electric Supply and Responsible Stewardship of Climate

More than one-third of CO_2 emissions are attributable to the electric power sector.[42] Energy use and the construction of fossil-fuel fired power generation facilities are increasing as population growth and development continue, especially in developing nations.[43] The majority of energy and power generation expansion will occur just in Asia over the next decade.[44] The U.S. Department of Energy forecasts that energy demand in developing Asia will double over the twenty-five years between 2004–2030.[45] Approximately sixty percent of all new power generation capacity financed in developing countries will be in Asia.[46] Some projections estimate that by 2020,

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39. *Summary of the DOHA Climate Change Conference*, *supra* note 24, at 26.

40. *See Negotiations Over The Kyoto Protocol Continue At The Doha Climate Talks*, CLIMATE PROGRESS (Dec. 1, 2012, 11:12 AM), http://thinkprogress.org/climate/2012/12/01/1267001/negotiations-over-the-kyoto-protocol-continue-at-the-doha-climate-talks.

41. *Id.* at 6.

42. *See* ENERGY INFO. ADMIN., *supra* note 4, at 5.

43. World Bank Statement, Ministerial Segment—COP11—Montreal, http://siteresources.worldbank.org/ESSDNETWORK/Resources/MINISTERIALSEGMENTCOP11Montreal.pdf; INT'L ENERGY AGENCY, *supra* note 5.

44. *See generally* INT'L ENERGY AGENCY, *supra* note 5.

45. *See* ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, REPORT NO. DOE/EIA-0484(2007), INTERNATIONAL ENERGY OUTLOOK 2007, at 5 (2007), http://www.eia.gov/forecasts/archive/ieo07/pdf/0484(2007).pdf.

46. R. David Gray & John Schuster, *The East Asian Financial Crisis—Fallout for Private Power Projects*, VIEWPOINT, Aug. 1998, at 1, *available at* http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/1999/08/15/000178830_98111703545549/Rendered/PDF/multi_page.pdf.

China alone will emit forty percent of the world's carbon emissions.[47]

Unabated, this exponential increase in power demand could tip the global environment thermostat to runaway global warming risk, regardless of what the United States, the European Union, Japan, and other developed nations do to reign in their carbon emissions.[48] Once installed, those power production facilities will remain in place, contributing to global warming—or not—for at least forty years and in many cases much longer. In this sense, the world stands at a crossroad.

Eighty percent of anthropogenic CO_2 emissions are from combustion of fossil fuels.[49] Power derived from burning gaseous, liquid, and solid fossil fuels to create electric power releases copious quantities of CO_2 into the environment.[50] Most countries are using fossil fuels, not renewable power resources, to satisfy this exponential increase in demand for more power. Coal consumption in Asia is more than triple the coal consumption in the United States and the European Union combined. Oil consumption in Asia Pacific has grown 777% from 1965 to 2012, while growing less than one-tenth that rate in the United States and the European Union in the same period.[51]

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47. Deborah E. Cooper, Note, *The Kyoto Protocol and China: Global Warming's Sleeping Giant*, 11 GEO. INT'L ENVTL. L. REV. 401, 405 (1999).

48. *See generally* RICHARD ALLEY ET AL., SUMMARY FOR POLICY MAKERS: A REPORT OF WORKING GROUP I OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (2007), http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf; *Developing Countries' Carbon Emissions Will Vastly Outpace Developed Nations, U.S. EIA Says*, HUFFINGTON POST (July 25, 2013, 7:59 AM), http://www.huffingtonpost.com/2013/07/25/carbon-emissions-developing-countries_n_3651513.html ("The fast economic growth of China and India over the coming years will play a central role in the global outlook for energy demand. 'These two countries combined account for half the world's total increase in energy use through 2040,' said EIA Administrator Adam Sieminski.").

49. ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, Report No. DOE/EIA-0573(2000), EMISSION OF GREENHOUSE GASES IN THE UNITED STATES 2000, at 7 (2001), http://enpub.fulton.asu.edu/cement/pdf/057300.pdf.

50. *See* FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, at § 6:7. *See* FERREY, UNLOCKING THE GLOBAL WARMING TOOLBOX, *supra* note 3, at 27.

51. Robert Rapier, *World Energy Consumption Facts, Figures, and Shockers*, ENERGY TRENDS INSIDER (June 28, 2012), http://www.energytrendsinsider.com/2012/06/28/world-energy-consumption-facts-figures-and-shockers.

Choice of today's power generation technology translates directly to the size of tomorrow's carbon footprint. Global CO_2 emissions are rising at the rate of approximately three percent worldwide and nine percent per year in China, the largest GHG emitter in the world.[52] It is expected that global energy use will increase by more than half by 2040 creating a tremendous demand on existing fuel sources.[53]

Internationally, the issue is how to insert renewable power into the explosion of electric production in developing countries. This is an equity issue: how do we get all nations to invest responsibly in fast-growing energy production? The International Energy Agency projected that it will require an investment of $16 trillion by 2030 to meet the world's energy requirements, with $5 trillion of that amount allocated to electric power production, primarily in Asia and Africa.[54]

Low GHG-emission technology exists to accomplish this. Ultimately, the challenge is legal and regulatory: the missing link is the institutional mechanism and model to steer and implement proper expenditure of climate funds in developing countries to implement sustainable technologies, The focus must be on the power sector and international mechanisms to affect the choices made therein.

The GHG mix of electric energy sources is within legal control by government policies and incentives. With 191 national parties, the United Nations Framework Convention on Climate Change

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52. *See* JOS G.J. OLIVIER ET AL., TRENDS IN GLOBAL CO_2 EMISSIONS: 2012 REPORT, 6 (2012), http://edgar.jrc.ec.europa.eu/CO2REPORT2012.pdf ("Global emissions of carbon dioxide (CO_2)—the main cause of global warming—increased by [three percent] in 2011, reaching an all-time high of 34 billion tonnes in 2011. In 2011, China's average per capita carbon dioxide (CO_2) emissions increased by [nine percent] to 7.2 tonnes CO_2."); Ray Purdy, *The Legal Implications of Carbon Capture and Storage under the Sea*, SUSTAINABLE DEV. L. & POL'Y, Fall 2006, at 22.

53. *See generally* INT'L ENERGY AGENCY, *supra* note 5; Moming Zhou, *World Energy Consumption to Increase 56% by 2040 Led by Asia*, BLOOMBERG NEWS (July 25, 2013, 2:55 PM), http://www.bloomberg.com/news/2013-07-25/world-to-use-56-more-energy-by-2040-led-by-asia-eia-predicts.html.

54. INT'L ENERGY AGENCY, WORLD ENERGY INVESTMENT OUTLOOK: 2003 INSIGHTS, 41, 343 (2003), http://www.worldenergyoutlook.org/media/weowebsite/2008-1994/weo2003.pdf.

(UNFCCC) has near universal membership of world countries.[55] The UNFCCC is the parent treaty that generated the 1997 Kyoto Protocol, which has, to date, 192 member parties.[56] Under the Kyoto Protocol, thirty-seven states, consisting of industrialized countries and the European community, have imposed greenhouse gas (GHG) emission limitation and reduction commitments,[57] while the remaining 155 developing countries among the 192 signatories, including the largest GHG emitter among all nations, have non-binding generic undertakings to limit emissions.[58] China, India, and Indonesia, all unregulated by the Kyoto Protocol, are among the world's largest producers of CO_2.[59] While GHG emissions in North America and Europe are declining, emissions in Asian and the Middle East, regions where many offset projects are located, continue to rise.[60]

Several developed countries have committed to the largest sustained international transfer of wealth in history: a commitment of an additional $100 billion per year of foreign aid continuing in perpetuity for the explicit purpose of dealing with global climate change.[61] Indeed, the Copenhagen Accord and the Cancun

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55. *See Status of Ratification of the Koyoto Protocol*, U.N. FRAMEWORK CONVENTION ON CLIMATE CHANGE, http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php (last visited Dec. 1, 2013).

56. *Id.*

57. *Kyoto Protocol*, *supra* note 23.

58. *Id.*

59. *Global Greenhouse Gas Emissions Data*, EPA, http://www.epa.gov/climatechange/ghgemissions/global.html (last updated Sept. 9, 2013); Simon Rogers & Lisa Evans, *World Carbon Dioxide Emissions Data by Country: China Speeds Ahead of the Rest*, THE GUARDIAN (Jan. 31, 2013, 2:30 PM), http://www.theguardian.com/news/datablog/2011/jan/31/world-carbon-dioxide-emissions-country-data-co2 (China, India, and Indonesia are the 1st, 3rd, and 16th, respectively, largest emitters of carbon).

60. *See* Fiona Harvey, *An Atlas of Pollution: The World in Carbon Dioxide Emission*, THE GUARDIAN (July 11, 2013, 5:11 PM), http://www.theguardian.com/environment/2011/jan/31/pollution-carbon-emissions (emissions in Asian and the Middle East regions are on the rise); *Issuance Certified Emission Reductions (CERs)*, U.N. FRAMEWORK CONVENTION ON CLIMATE CHANGE, http://cdm.unfccc.int/Issuance/cers_iss.html (displaying issuances under the CDM, with majority to projects in China and India).

61. U.N. SECRETARY-GENERAL, REPORT OF THE U.N. SECRETARY-GENERAL'S HIGH-LEVEL ADVISORY GROUP ON CLIMATE CHANGE FINANCING 5 (Nov. 5, 2010),

Agreements call on developed countries to provide new and additional resources for climate actions—$30 billion USD over 2010–2012 and a longer term goal phasing up to $100 billion per year by 2020.[62] Reiterating the pledge made in Copenhagen in 2009, the Cancun Agreements of December 2010 formally commits developed countries to collectively provide resources approaching $30 billion USD for the period 2010–2012 to support developing countries' climate efforts.[63] This so-called "fast-start" finance will help developing countries, particularly the poorest and most vulnerable, reduce their greenhouse gas emissions, and adapt and cope with the effects of climate change.

On the donor side of developed countries, there is an obligation to help donor countries make the transition to a lower carbon world. On the donee/developing country side, there is an obligation to use the donations responsibly for their intended purpose of lower emissions. Solutions will require implementation of new regulatory mechanisms for successful technology transfer and deployment. It is essential to get the infrastructure right at the time that it is installed, as it controls the form and function of long-term GHG emission mechanisms: "[t]he stakes, for all life on the planet, surpass those of any previous crisis."[64]

With the fastest GDP growth, rate of basic infrastructure investment, and energy growth rates among world economies in developing countries, there is an unprecedented expenditure on new "greenfield" infrastructure. It is in these fast-developing nations where sustainable renewable power technology can be deployed *ab initio* for the structural backbone of rapid electric power development. So with this massive committed influx of capital for

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http://www.un.org/wcm/webdav/site/climatechange/shared/Documents/AGF_reports/AGF_Final_Report.pdf.

62. *Id.* at 5–7.

63. *Id.* at 8. The Cancun Agreements mandate that fast-start funds have a "balanced allocation between adaptation and mitigation," are "new and additional," are "prioritized for the most vulnerable developing countries, such as the least developed countries, small island developing States and Africa," and include "forestry and investments through international institutions." Taryn Fransen & Smita Nakhooda, *5 Insights from Developed Countries' Fast-Start Finance Contributions*, WORLD RESOURCES INST. (June 11, 2013), http://www.wri.org/blog/5-insights-developed-countries-fast-start-finance-contributions.

64. Hansen, *supra* note 37, at 229.

developing country GHG emission control and adaptation, there must be a mechanism to control how funds are used to support sustainable infrastructure and CSR. There are trustworthy models of how sustainable energy sector technology can be implemented even in previously non-competitive or monopolized electric power sectors in developing countries.

C. Models of Sustainable International Energy Development

A handful of developing Asian nations have pioneered renewable electric energy programs to augment long-term sustainable infrastructure and reduce their emissions of greenhouse gases. In this section, I will focus on a proven mechanism for renewable energy development in developing countries, based on my work with the World Bank and United Nations in developing countries over the past two decades. Between 1993 and 2010, these nations in Asia have been among the first in developing small power producer (SPP) programs to promote renewable energy development in their countries. These programs create important models on how to best realize success on global warming policy in the energy sector. More specific detail on these Asian developing country programs is set forth in a book[65] and a law review article[66] focused on developing countries.

1. Basic Program Contours

They have achieved in just a few years a substantial contribution of new renewable small power projects to the national energy supply, achieving almost five percent of total power supply in states in India, Sri Lanka, and Thailand. The models analyzed in my World Bank assessment are drawn from countries with different forms of government and have different predominant fuel sources in their generation base (hydro, coal, gas, and oil). Table 1 displays key comparative elements of program design and implementation regarding primary generation source for projects, size limitations,

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65. STEVEN FERREY WITH ANIL CABRAAL, RENEWABLE POWER IN DEVELOPING COUNTRIES: WINNING THE WAR ON GLOBAL WARMING (2006).

66. Steven Ferrey, *Power Paradox: The Algorithm of Carbon and International Development*, 19 STAN. L. & POL'Y REV. 510 (2008).

whether there were premiums for renewable power, and year begun in five of the programs surveyed.

Table 1: Comparative Asian Renewable Power Program Overview

Country Program	**Year Begun**	**Maximum Size (MW)**	**Premium for Renewable Energy**	**Primary Fuel Used**	**Eligible PPA Solicitation**
Thailand	1992	60 or <90	Yes, competitive bid	Gas	Controlled period
Indonesia	1993	<30 Java <15 other island grids	No	Renewable energy	Controlled Period
Sri Lanka	1998	<10	No	Hydro	Open offer
India: Andhra Pradesh	1995	<20 Prior <50	Yes, in tariff	Wind	Open offer
India: Tamil Nadu	1995	<50	No	Wind	Open offer

The key legal document to facilitate private sector PPAs (power purchase agreements) is a fair and neutral power purchase agreement which obligates the utility to purchase independently produced renewable power. Table 2 displays salient comparative elements of legal design of the PPA and contractual entitlement in five of the Asian programs surveyed. A "firm" sale requires the power seller to commit to sell a set quantity or capacity of power to the purchasing utility; a "non-firm" sale allows the seller to vary the quantity of power it elects to sell at any time. Such a "non-firm" sale characterizes the ability of an intermittent renewable power source, such as wind or solar photovoltaic panels, to generate power.

To provide some detail regarding the terminology used, third-party sales allow the renewable power generator to sell at retail to power consumers directly, bypassing the wholesale sale to the state utility.

This provides alternative options to secure a revenue stream to such a project. Self-service wheeling allows use of the utility transmission system to put power into the power grid at, for example, the wind generation site and withdraw an equivalent amount of power at one's factory or business at a distant location from the generation. This essentially allows a virtual geographic bridge between a power generation source and the owner's point of consumption of that power. Net metering is the ability to sell surplus self-generated power to the utility grid, receiving a credit or turning one's retail consumption meter in reverse to reflect such sale back to the utility.[67] Each of these regulatory embellishments benefits the independent small power seller.

Table 2: Comparative PPA Elements

Country program	**Standard PPA?**	**Maximum years**	**Third-party sales**	**Self-service wheeling**	**Net meter-banking**
Thailand	Yes	20–25 firm 5 nonfirm	No, under considera-tion	No, under consider-ation	Yes, if <1 MW
Indonesia	Yes	20 firm 5 nonfirm	No	Yes	No
Sri Lanka	Yes	15	No	No	No
India: Andhra Pradesh	Not formally, but a de facto standardized form	20	No, previously allowed	Yes, but very expensive	Yes
India: Tamil Nadu	In development	5–15	No, previously allowed	Yes	Yes

67. *See* Steven Ferrey, *Nothing But Net: Renewable Energy and the Environment,* MidAmerican *Legal Fictions, and Supremacy Doctrine*, 14 DUKE ENVTL. L. & POL'Y F. 1, 15–16 (2003).

These countries have differing policies in different programs on direct retail third-party sales, self-wheeling, and net metering or energy banking.[68] Table 3 displays comparative elements of the PPA tariff in these same countries. The tariff sets the price that the country's utility agrees in the PPA to purchase wholesale power produced under the SPP independent energy programs. "Avoided cost" is the cost at which the utility that purchases the power of the small power seller could either add power generating capacity to generate that additional amount of power itself or purchase that amount of power from others in the wholesale power market.[69]

Table 3: Comparative Tariff Elements

Country program	**Avoided cost basis**	**Indexed to foreign currency**	**Periodically adjusted**	**Design elements**
Thailand	Yes, energy and capacity payment for firm contracts only	No	Yes	Utility purchases 65% of off-peak power
Indonesia	Yes, both energy and capacity	Yes	Yes, for changes in avoided capacity cost	Steep on-peak incentives; differentiated for each island grid

68. Steven Ferrey, *Small Power Purchase Agreement Application for Renewable Energy Development: Lessons from Five Asian Countries*, WORLD BANK 4–9, 14 (2004), http://siteresources.worldbank.org/INTEAPREGTOPENERGY/Resources/Power-Purchase.pdf. For a discussion of the topics, see FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, at §§ 4:26–4:28 and 10:1.

69. 18 C.F.R. § 292.101(6) (2013); *see also* FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, at §§ 7.

Sri Lanka	Yes, energy only; non-dispatchable units receive less than full avoided energy cost	Not directly, but price linked to dollar-de-nominated imported oil price	Yes, and includes foreign fuel component	Calculated annually, based on three-year moving average imported oil price
Andhra Pradesh	Yes, not to exceed 90% of retail tariff	No	Yes	Reset every three years
Tamil Nadu	Exceeds voided cost	No	Yes	Higher tariff for biomass than wind

Both the "avoided cost" tariff concept and a standardized power purchase agreement are utilized in most successful SPP and renewable energy programs in developing nations. This is consistent with the Public Utility Regulatory Policies Act (PURPA) requirements in the U.S. legal system.[70] "Avoided cost" prices for the sale of power have been the cornerstone of the PURPA program in the United States for thirty years, and it is an internationally recognized equitable pricing principle for power sales.

2. Renewable Development and International Equity

Encouraging and providing incentives for renewable power development in developing nations is a critical component of international equity. Even where developing nations feature different forms of governance and have different predominant fuel sources in their power generation bases (hydro, coal, gas, or oil), there are common principles that are present for successful small renewable energy programs for climate control:

- Transparent Regulatory Process: A transparent regulatory process is required to build investor, developer, and lender confidence.
- Standardized PPA: All programs employ either *de jure or de facto* standardized PPAs, and most

70. 18 C.F.R. § 292.101 (2013); 16 U.S.C. § 824a-2 (2013).

employ either an avoided cost-based tariff or avoided cost principles. All afford some form of long-term firm contract commitment.

- Legal Dispute Resolution Mechanism: A legal framework for structured project development that features an acceptable mechanism for fair and prompt resolution of disputes between buyer and seller of power is necessary.
- Allocation of Legal Risks: A variety of commercial, sovereign, currency, and regulatory risks are implicitly or expressly allocated in the power sector.[71] The Thai program reduces the future SPP payment for capacity where the SPP does not deliver. Tamil Nadu facilitates SPP power wheeling.
- Interconnection Requirements: Utilities must interconnect the utility grid with renewable energy SPP projects subject to a straightforward procedure to accomplish this without significant transaction costs or interconnection risk.
- Legal Milestones and Bid Security: To eliminate the speculative risk of slow or non-development, the Thai program requires a bid security deposit of 500 baht per kW ($12 per kW) of capacity pledged in the PPA.[72] This puts at risk "earnest money" of the developer to proceed expeditiously. Sri Lanka, beginning in 2003, placed a new six-month limit on the validity of Letters of Intent granted to renewable project developers and required bid security bonds of SL Rs. 2,000 per kW ($20 per kW).[73] This added to the previously discussed Thai financial security requirement, a time limit to prevent developers from hoarding sites.
- Avoided Cost Principals: The state utility has a monopoly on the purchase of wholesale power in

71. For a discussion of these topics, see generally FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, at § 3:11.

72. Ferrey, *supra* note 68, at 12, 25–29.

73. *Id.* at 12.

most of the electric sectors of developing nations of the world. They are the only entity to whom independently produced power can be sold. To yield a fair rate for this sale, the power purchasing utility and transmission provider (also typically the same utility) must be subject to objective PPA and tariff principles to set avoided cost.

- Renewable Set-Aside: The program in Thailand allocates government entitlements and subsidies in order of the most preferred renewable energy projects, favoring the lowest requested subsidy for renewable projects. A variant of this in twenty-nine U.S. states employs a renewable portfolio standard to subsidize a minimum percentage of renewable energy power incorporated in the supply portfolio of each retail seller of power.[74]
- Third-Party Sales: None of these Asian SPP programs currently allows direct third-party retail sales of power by the SPP (except in limited industrial estate areas). However, other states in India do allow direct retail sales, and other programs are considering this embellishment.[75]
- Net Metering and Energy Banking: Energy banking is allowed in eighty-five percent of the states in the United States in the form of "net metering."[76] Several of the Asian countries adopted energy banking variants, and in 2009, Sri Lanka adopted net metering.

The legal regulatory structure and laws of the country must also be carefully crafted to facilitate the interface of renewable energy

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74. *See* Steven Ferrey, *Threading the Constitutional Needle with Care,* 7 TEX. J. OF OIL GAS & ENERGY L. 59, 62 n.15, app. A (2012) [hereinafter Ferrey, *Threading the Constitutional Needle*]; Steven Ferrey, *Renewable Orphans: Adopting Legal Renewable Standards at the State Level*, ELECTRICITY J., Mar. 2006, at 52, 52–53.

75. Ferrey, *supra* note 68, at 14.

76. Steven Ferrey, *Virtual "Nets" and Law: Power Navigates the Supremacy Clause,* 24 GEO INT'L ENVTL. L. REV. 267, 274, Table 1 (2012) [hereinafter Ferrey, *Virtual "Nets" and Law*].

projects as a substantial component of the previously monopolized power supply system of the country. This can be accomplished with careful guidance. Elements of the tariff for the sale of power are highlighted in Table 4, including whether it is based on accepted avoided cost principles and whether the power can be dispatched or controlled as to time, by the utility.

Table 4: PPA Successful Management Design and Practices

Successful design and management practice features	**Thailand**	**Indonesia**	**Sri Lanka**	**India: Andhra Pradesh**	**India: Tamil Nadu**
PPA size <0.5% of system capacity	Yes	Yes	Yes	Yes	Yes
Open offer if need capacity	Non-Applic-able	No, but very large solicitation	Yes	Yes	Yes
Controlled solicitation if surplus capacity	Yes	Non-Applicable	Non-Applic-able	Non-Applicable	Non-Applicable
Milestones on development time afforded SPP	Non-App-licable	Yes	Yes	Yes, if NEDCAP financial guarantees	Non-Applicable
Bid security deposit by SPP	$12 per kW	Non-Applicable	$20 per Kw	Non-Applicable	Non-Applicable

How renewable technologies are encouraged	Comp-etitive award subsidy	Hierarchy of renew-able SPP preference; floor price on renew-able power	Floor price on renew-able power	Tariff differ-entiated for base load power and inter-mittent renewable SPPs	None
Competitive solicitation	Yes	Yes	No	No	No
Standardized PPA	Yes	Yes	Yes	Yes	No, under-develop-ment
Long-term firm PPAs	Yes	Yes	Yes	Yes	Yes
Avoided cost based tariff	Yes	Yes	Yes	Yes	Yes
Capacity payment for long-term power	Yes	Yes	No	No	No
Allocation of performance risk between seller and buyer	Alteration of capacity payment; utility can refuse delivery	Neutral; originally mutual best efforts	Neutral; mutual best efforts	Nonfirm, but utility must accept all power	Nonfirm, but utility can refuse delivery
Capacity payment adjustment if seller does not deliver power	Yes	No, capacity payments in peak rate	Non-Applic-able	Non-Applicable	Non-Applicable

SPP unit dispatchable	Yes, if firm capacity PPA; 80% minimum annual output purchase obligation	No, as PPA origin-ally conceived, dispatch-able without limitations after PPA changed	No	No	No
Wheeling, net metering, or energy banking	Energy banking	Wheeling	Non-Applic-able	Energy banking, wheeling	Energy banking, wheeling

The Clean Development Mechanism (CDM) under the Kyoto Protocol allows projects that reduce greenhouses gases in developing nations to earn Certified Emission Reductions (CERs) for each ton of CO_2-equivalent of GHG reduced.[77] Those CERs are then traded or sold to owners of activities in Annex I developed countries which increase that country's carbon emission cap allocated in the Protocol. Credits generate value for a maximum of seven years with two renewals (twenty-one total years), or a maximum of ten years with no renewal.[78] Some CERs related to forestry projects are deemed temporary for a period up to sixty years,[79] subject to verification on a recurring five-year basis that burning or logging does not later release carbon from the forest.

77. *See* Kyoto Protocol to the United Nations Framework Convention on Climate Change art. 12, Dec. 10, 1997, U.N. Doc FCCC/CP/1997/7/Add.1, 37 I.L.M. 22 (1998); *CEPS Carbon Market Forum: CDM Policy Dialogue—Views on the Review*, CARBON MARKET WATCH 2 (2012), http://www.ceps.eu/files/ViewsCDMReview.pdf.

78. *CEPS Carbon Market Forum*, *supra* note 77 at 2.

79. *See* Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol, Montreal, Can., Nov. 28–Dec. 10, 2005, *Part Two: Action Taken by the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol*, U.N. Doc. FCCC/KP/CMP/2005/8/Add.1 (Mar. 30, 2006); Martijn Wilder, *Nature of an Allowance*, *in* CLIMATE CHANGE: A GUIDE TO CARBON LAW AND PRACTICE 93 (Paul Q. Watchman ed., 2008).

The CDM process has registered 7,401 projects and issued 1,410,256,823 CERs at the time the article went to press.[80] To date, world-wide, renewable energy projects account for twenty-eight percent of CDM CERs; methane capture and flaring projects producing no electricity, mostly located at large landfills, coal mines, and combined animal feeding operations (CAFOs), account for nineteen percent of CERs.[81] Of note, a 2007 study of ninety-three projects estimated that about forty percent of smaller than average projects (accounting for twenty percent of total emissions reduction under the CDM) were non-additional, and thus should not have been eligible under CDM.[82]

There is a model of best practices for how to structure a low-carbon high-development growth curve for the fundamental infrastructure of developing nations. In the global context, CSR will be implemented, or not, on the supply side of the equation, in how electric power is generated. With the fastest electric growth rate in the world, it is a critical that developing countries elect to generate power from socially responsible generation in an era of significant climate change concerns. Because of the amount of new construction of power generation in developing countries, they offer a "blank slate" for structuring in a sustainable manner their generation of additional power.

III. CSR AT THE DOMESTIC ENERGY MARGIN

A. Federal Environmental Review

Turning to the domestic arena, CSR offers dimensions for both new and existing economic activities. There is an evaluation process

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80. *Clean Development Mechanism*, U.N. FRAMEWORK CONVENTION ON CLIMATE CHANGE, http://cdm.unfccc.int (last visited Dec. 1, 2013) (stating number of projects certified and CERs issued); *see also Project Activities,* U.N. FRAMEWORK CONVENTION ON CLIMATE CHANGE, http://cdm.unfccc.int/Statistics/Public/CDMinsights/index.html (last updated Oct. 31, 2013).

81. Michael Wara, *Measuring the Clean Development Mechanism's Performance and Potential*, 55 UCLA L. REV. 1759, 1779 (2008).

82. LAMBERT SCHNEIDER, IS THE CDM FULFILLING ITS ENVIRONMENTAL AND SUSTAINABLE DEVELOPMENT OBJECTIVES?: AN EVALUATION OF THE CDM AND OPTIONS FOR IMPROVEMENT 9 (2007), http://www.oeko.de/oekodoc/622/2007-162-en.pdf.

associated with necessary major federal permits for new economic activities. Recently, consideration of GHG emissions has been grafted into this evaluation.

Environmental review and impact statements are embedded in both federal and some state laws since the early 1970s.[83] The relevant statutory language is set out in section 102(c) in NEPA where a "major Federal action significantly affect[s] the quality of the human environment."[84] These requirements impose a statutory obligation on federal or state agencies to determine whether a project (1) involves major federal or state action and (2) poses significant impacts on the environment. If so, a specific process is set forth to examine these impacts prior to any federal or state officials taking major federal or state action, typically in the form of a federal or state permit or funding for the project.[85]

The mechanism for satisfying these objectives for those proposed activities that could have a significant impact is through preparation of "a detailed statement" for federal actions that significantly affect the physical quality of the environment.[86] When an Environmental Impact Statement (EIS) is required, this "detailed statement" will address the proposed action's environmental impacts;[87] unavoidable adverse impacts;[88] and alternatives to the proposed action.[89]

While the review of an EIS "must be careful, the ultimate standard is a narrow one. A court is not to substitute its judgment for that of the agency."[90] While there is no requirement under NEPA that an EIS include all of the underlying data on which it is based,[91] an EIS must disclose and discuss responsible opposing views.[92] An agency must take a "'hard look' at the environmental consequences of its decision

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83. National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321 et seq. (2006).

84. *Id.* § 4332(2)(C)(i)–(ii).

85. *Id.* § 4332(2)(C)–(D).

86. *Id.* § 4332(2)(C).

87. *Id.* § 4332(2)(C)(i).

88. *Id.* § 4332(2)(C)(ii).

89. *Id.* § 4332(2)(C)(iii).

90. Wilderness Soc'y v. Salazar, 603 F. Supp. 2d 52, 59 (D.D.C. 2009).

91. Sierra Club v. Kimbell, 595 F. Supp. 2d 1021, 1039 (D. Minn. 2009), *aff'd,* 623 F.3d 549 (8th Cir. 2010).

92. Pac. Coast Fed'n. of Fishermen's Ass'ns v. Nat'l. Marine Fisheries Serv., 482 F. Supp. 2d 1248, 1253 (W.D. Wash. 2007).

to go forward with a project."[93] A court "is not required to decide whether the EIS is based on the best scientific methodology available or to resolve disagreements among experts. Instead the court's task is to ensure that the procedure followed resulted in reasoned analysis of evidence."[94] Executive Order 12898 instructs federal agencies to consider the environmental justice impacts of their actions, but does not create a private right of action on such considerations.[95]

GHG emissions have been added to this evaluation. In 2009, the Environmental Protection Agency (EPA) issued a proposed endangerment finding for both public health and welfare for carbon dioxide and the five other greenhouse gases regulated by the Kyoto Protocol—methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.[96] EPA did not include other greenhouse gases, such as water vapor, chlorofluorocarbons (CFCs), hydochlorofluorocarbons (HCFCs), halons, black carbon, and fluorinated ethers.[97] EPA also initiated a mandatory GHG reporting rule requiring an enumerated list of sources that emit more than 25,000 TPY of CO_2 equivalents to institute certain monitoring, recordkeeping, and reporting requirements. EPA's most recent initiative is its proposed rule to regulate GHG emissions from electric generation units (EGUs) under the Clean Air Act's New Source Performance Standards (NSPS) program.

CO_2 is now assessed as part of an EIS for new developments with major federal action. In 2010, the Council on Environmental Quality published *Draft NEPA Guidance on Consideration of Climate*

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93. *Wilderness Soc'y*, 603 F. Supp. 2d at 59 (citing Nuclear Info. & Res. Serv. v. Nuclear Reg'y Comm'n, 509 F.3d 562, 568 (D.C.Cir.2007)).

94. *Pac. Coast Fed'n of Fisherman's Ass'ns*, 482 F. Supp. 2d at 1253 (citing Seattle Audubon Soc. v. Moseley, 798 F. Supp. 1473 (W.D. Wash. 1992)).

95. Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, Exec. Order No. 12,898, 59 Fed. Reg. 7629, 7629, 7632–33 (Feb. 11, 1994), *amended by* Exec. Order No. 12,948, 60 Fed. Reg. 6831 (Jan. 30, 1995). The Administrative Procedures Act's "arbitrary and capricious" standard would apply to court determination of a challenge to agency action.

96. Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 18886, 18888 (proposed Apr. 24, 2009).

97. *Id.* at 18896–98.

Change and GHG Emissions.[98] The guidance suggests a threshold level of direct GHG emissions of 25,000 metric tons annually as an indicator that the climate impacts of a project warrant analysis under NEPA. For long-term projects that have annual emissions of less than 25,000 metric tons, the guidance encourages federal agencies to consider whether the project's cumulative long-term emissions might still warrant analysis. The guidance suggests that EISs should address climate mitigation and adaptation measures when considering project alternatives. It also suggests that EISs should consider emissions from all stages of a project's life cycle when feasible, including indirect or induced emissions from vehicles and material supply chains whenever initial scoping indicates that they might be significant. Some federal agencies issued internal guidance for addressing climate change in EISs, adopting various procedures in the absence of finalized Council on Environmental Equality (CEQ) rules, including the Department of Interior,[99] the U.S. Forest Service,[100] and the Federal Aviation Administration.[101]

B. State Requirements

Many states have similar mechanisms at the state level. The California Sustainable Communities and Climate Protection Act of 2008[102] requires the state Air Resources Board to establish GHG emission reduction targets for each Metropolitan Planning Organization (MPO), which are federally mandated regional governments, in California each including a county. Each MPO must then prepare a Sustainable Community Strategy, combining land-use

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98. *See* Memorandum from Nancy H. Sutley, Chair, Council on Envtl. Quality, to Heads of Fed. Dep'ts & Agencies (Feb. 18, 2010), http://energy.gov/sites/prod/files/CEQ_Draft_Guidance-ClimateChangeandGHGemissions-2.18.10.pdf.

99. Dep't of the Interior, Secretarial Order No. 3226, Amendment No. 1 (Jan. 16, 2009).

100. *Climate Change Considerations in Project Level NEPA Analysis*, U.S. FOREST SERV. (Jan. 13, 2009), http://www.fs.fed.us/emc/nepa/climate_change/includes/cc_nepa_guidance.pdf.

101. Memorandum from Julie Marks, Manager, Envtl. Policy and Operations, to FAA Lines of Business Managers with NEPA Responsibilities (Jan. 12, 2012), http://www.faa.gov/air_traffic/environmental_issues/media/Memo-AEE-400_GuidncMem3_GHG_Climate_NEPA_Intrm_12JAN2012.pdf.

102. Cal. Gov't Code § 14522.1 et seq., § 65080(b)(2) (Deering 2012).

and transportation planning, to achieve the state goals, which allows qualifying developments to enjoy streamlined review under California's Environmental Quality Act. The focus is on reducing vehicle miles traveled and altering transportation planning and housing development patterns. Zoning must be revised for areas of a community to meet their fair share of housing, and a private right of action is created to enforce this rezoning. Consistent projects that enjoy expedited review must include dense residential developments near public transit, be served by existing utility infrastructure, not contain historic resources or wetlands, be more energy efficient than required by code, use less water than normal, promote a share of affordable housing, and contain less than 200 total residential units.

In Massachusetts, there is the Massachusetts Environmental Policy Act (MEPA),[103] a NEPA analogue. A 2010 GHG Policy provides a list of mitigation measures that should be considered by a proponent during the MEPA review process.[104] Pursuant to the Massachusetts MEPA Greenhouse Gas Emissions Policy and Protocol, if a project requires a mandatory Environmental Impact Report (EIR) or the Secretary requires the preparation of an EIR on a discretionary basis, the Secretary's Certificate on the Environmental Notification Form will include a scope for the quantification of project-related greenhouse gas CO_2 emissions.[105]

The CO_2 quantification process requires the proponent to: (1) identify the project baseline, (2) calculate estimated greenhouse gas emissions from the project baseline condition, and (3) calculate estimated emissions reductions based on mitigation measures by comparing project alternatives to the baseline. A project proponent

103. MASS. GEN. LAWS ch. 30, §§ 61–62H (2013).

104. EXECUTIVE OFF. OF ENERGY AND ENVTL. AFF., REVISED MEPA GREENHOUSE GAS EMISSIONS POLICY AND PROTOCOL 9 (May 5, 2010), http://www.mass.gov/eea/docs/mepa/ghg-policy-final.pdf [hereinafter MEPA POLICY AND PROTOCOL]. Some of the suggestions made by EEA include: design the project to support alternative transportation to site including transit, walking, and bicycling; minimize energy use through proper building orientation and use of appropriate landscaping (e.g. trees for shading parking lots or southern facing facades); design roofs at a minimum to be solar ready; use energy efficient boilers, heaters, furnaces, incinerators, or generators; construct green roofs to reduce heat load on roof, further insulate, and retain/filter rainwater; use demand control ventilation; seal and leak-check all supply air ductwork; etc. *Id.* at 14–17.

105. *Id.* at 2.

must identify both the "direct"[106] and "indirect"[107] sources of greenhouse gas emissions that the project will produce. For "indirect" emissions the proponent should multiply the total electricity used by an emissions factor that calculates the CO_2 emitted through the generation of electricity.[108] The current ISO-New England Marginal Emissions Report, which calculates in pounds the amount of CO_2 produced for every megawatt hour for a variety of stationary combustion sources, is used.[109] Projects also generate GHG emissions indirectly through traffic generation and associated fuel combustion, which must be modeled for employees, vendors, customers, and others.[110]

The analysis focuses primarily on CO_2, yet analysis of other GHGs may be required for certain projects, such as methane emissions from landfills and wastewater treatment plants, emissions of hydrofluorocarbons and perfluorocarbons from the manufacturing, servicing and disposal of refrigeration and air conditioning equipment,

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106. *Id.* at 4. On-site combustion occurs whenever a stationary source such as a boiler, heater, furnace, incinerator, oven, etc. burns fossil fuels for heat, hot water, and/or on-site electricity generation. *Id.* If the proposed project will have fleet vehicles on-site, such as forklifts, tractors, fueling trucks, maintenance and security vehicles, then the CO_2 emissions from those vehicles must be included in the calculation of "direct" emissions. *Id.* at 4–5.

107. *Id.* at 4. "Indirect" emissions are emissions from generating plants supplying electricity to the proposed project and emissions from vehicle trips generated by the project. *Id.* The proponent must calculate how much energy, including electricity, heat, and cooling the project will consume and then calculate the greenhouse gas emissions produced by off-site facilities providing such energy. *Id.* With regard to vehicle trips, the proponent must determine the number of employees, vendors, customers, and others who will drive to the project and calculate the CO_2 emissions produced by those trips. *Id.* at 5.

108. *Id.* at 9.

109. ISO NEW ENGLAND, 2007 NEW ENGLAND MARGINAL EMISSIONS RATE ANALYSIS (2009), http://www.iso-ne.com/genrtion_resrcs/reports/emission/2007_mea_report.pdf.

110. MEPA POLICY AND PROTOCOL, *supra* note 104, at 5. The model must estimate projected net new trips within the study area identified for the project traffic study. *Id.* at 9. Net new trips are expressed in daily vehicle miles of travel for weekday and weekend conditions, multiplied by annual miles/year by the appropriate EPA MOBILE 6.2 CO_2 emission factor (grams/mile) and divided by 907,185 grams/ton to obtain annual CO_2 emissions (tons/year). *Id.* MOBILE 6.2 provides emission factors by vehicle type, ranging from 368.5 grams/mile for light-duty gasoline vehicles up to 1,633.1 grams/mile for the heaviest diesel trucks. *Id.* at 9 n.7.

and other GHGs emitted through various chemical and manufacturing processes, using the Energy Information Administration Emissions Factor and Global Warming Potentials or similar sources.[111] When calculating the baseline for transportation-related emissions, the GHG Policy requires the proponent to estimate the net new trips within the study area identified for the project traffic study.[112] Once the baselines are determined, the proponent must calculate and compare GHG emissions associated with alternative mitigation measures.[113] In addition to outlining the mitigation measures that were chosen, the proponent should explain which alternative measures were rejected, and the reasons for rejecting them.[114] Mitigation for siting and design variables includes:[115]

- Minimizing building footprint
- Design of projects to support alternative transportation to the site including transit, walking and bicycling
- Minimization of energy use through building orientation
- Mitigation for building design and operation could include:[116]
- Construct green roofs
- Use high-albedo roofing materials
- Install high-efficiency HVAC systems
- Eliminate or reduce use of refrigerants in HVAC systems

111. *Id.* at 8; *see also Voluntary Reporting of Greenhouse Gases Program*, U.S. ENERGY INFO. ADMIN., http://www.eia.doe.gov/oiaf/1605/emission_factors.html (last visited Dec 1, 2012).

112. MEPA POLICY AND PROTOCOL, *supra* note 104, at 5. This should be expressed in daily vehicle miles of travel (VMT) for weekday and weekend conditions and the calculations for customers, employees, and truck trips should be analyzed separately. *Id.* at 9. The direct emissions from fleet vehicles, if any, are also calculated by determining VMT. *Id.* at 10. EEA suggests that proponents consider the vehicle class, number of vehicles, vehicle speeds, and average number and distance of on-site trips for the various fleet vehicles. *Id.*

113. *Id.* at 10–11.

114. *Id.* at 11.

115. *Id.* at 14.

116. *Id.* at 14–16.

- Reduce energy demand using peak shaving or load shifting strategies
- Maximize interior day-lighting through floor plates, increased building perimeter and use of skylights, celestories, and light wells
- Incorporate window glazing to balance and optimize day-lighting, heat loss, and solar heat gain performance
- Incorporate super-insulation to minimize heat loss
- Incorporate motion sensors and lighting and climate control
- Use efficient, directed exterior lighting
- Incorporate on-site renewable energy sources into project
- Incorporate combined heat and power (CHP) technologies
- Use water conserving fixtures that exceed building code requirements
- Re-use gray water and/or collect and re-use rainwater
- Provide for storage and collection of recyclables
- Re-use building materials and products\
- Use building materials with recycled content
- Use building materials that are extracted and/or manufactured within the region
- Use rapidly renewable building materials
- Use wood that is certified in accordance with the Forestry Stewardship Council's Principles and Criteria
- Use low-VOC adhesives, sealants, paints, carpets and wood
- Conduct 3rd party building commissioning to ensure energy performance
- Track energy performance of buildings to maintain efficiency
- Provide construction and sustainable design for build-out by tenants
- Purchase Energy Star-rated appliances that are the lowest energy rating.

- Mitigation for transportation GHG impacts could include:[117]
- Locate new buildings in or near areas designated for transit-oriented development
- Purchase alternative fuel and/or fuel efficient vehicles for fleet
- Provide new transit service or support extension/expansion of existing transit
- Subsidize transit passes
- Reduce employee trips during peak periods through work schedules, telecommuting

For new corporate activities that require a major federal or state permit, funding or other major action, the EIS process requires evaluation of significant environmental impacts, alternatives and mitigation options. This now includes GHG emissions and climate impact. So for such new or additional undertakings, a mechanism is in place. We next focus on the major impact of CSR for buildings, which exert a significant impact on the environment.

C. CSR for New and Existing Buildings

Every corporation utilizes buildings for its operations, although not all corporations emit additional emissions through in-house manufacturing activities. While generally not considered a major contributor to global warming, "[b]uildings and their construction account for nearly half of all greenhouse gas emissions and energy consumed in this country each year."[118] In the United States,

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117. *Id.* at 14, 17.

118. Sarah Fox, Note, *A Climate of Change: Shifting Environmental Concerns and Property Law Norms through the Lens of LEED Building Standards,* 28 VA. ENVTL. L.J. 299, 302 (2010); *see also* Sarah B. Schindler, *Following Industry's LEED®: Municipal Adoption of Private Green Building Standards*, 62 FLA. L. REV. 285, 288 (2010):

> Construction and demolition waste make up approximately one-third of all landfilled materials. Stormwater runoff from roofs containing asbestos degrades local stream and river quality, as does erosion and sediment from building construction practices. Buildings and infrastructure contain up to [ninety percent] of all materials that have ever been extracted from the environment, and in the United States,

buildings (residential and commercial use combined) accounted for seventy-two percent of the total U.S. electricity consumption in 2006 (expected to rise to seventy-five percent in 2025) and thirteen percent of the daily water consumption in the United States.[119] In addition, buildings (residential and commercial combined) in the United States contributed 38.9% of the nation's total carbon dioxide emissions in 2008.[120] The amount of waste generated by the combination of construction and design and municipal solid waste from building construction, renovation, use and demolition totals two-thirds of all non-industrial solid waste generated in the United States.[121]

Greater adoption of energy efficient technologies could reduce building energy use by forty-one percent and emissions by seventy percent by 2050 compared to a 2000 baseline, employing a combination of improved energy efficiency standards for new buildings and an accelerated rate of building renovations.[122] Federal legislation has addressed energy efficiency for buildings:

- Energy Policy and Conservation Act (EPCA)[123]
- Energy Conservation in Existing Buildings Act of 1976[124]
- Energy Conservation Standards for New Buildings Act of 1976[125]

> buildings consume nearly [forty percent] of all primary energy. On an even broader scale, building construction activities and the energy used to operate those buildings contribute more than any other source to man-made carbon dioxide production, and thus to climate change.

119. *Buildings and their Impact on the Environment: A Statistical Summary*, EPA 2, 3 (Apr. 22, 2009), http://www.epa.gov/greenbuilding/pubs/gbstats.pdf.

120. *Id.* at 2.

121. *Id.* at 6.

122. INT'L COUNCIL OF CHEM. ASS'NS, ICCA BUILDING TECHNOLOGY ROADMAP: THE CHEMICAL INDUSTRY'S CONTRIBUTIONS TO ENERGY AND GREENHOUSE GAS SAVINGS IN RESIDENTIAL AND COMMERCIAL CONSTRUCTION, at iv (2012), http://www.icca-chem.org/ICCADocs/Building%20Technology%20Roadmap%20-%20Report.pdf.

123. Pub. L. 94–163, 89 Stat. 871(1975) (codified as amended at 42 U.S.C. 6201 et seq.). EPCA was amended in 1978, 1985, 1990, and 1994.

124. Pub. L. No. 94–385, title IV, 90 Stat. 1150 (1976) (codified as amended at 42 U.S.C. 6851 et seq.).

- Energy Conservation and Production Act[126]
- National Energy Conservation Policy Act[127]
- Energy Policy Act of 1992[128]
- Energy Policy Act of 2005[129]
- Energy Independence and Security Act of 2007 (EISA)[130]
- American Recovery and Reinvestment Act of 2009[131]

Only the original EPCA and its 1978 amendments, the 1992 Energy Policy Act and the 2007 EISA, attempted to clearly impose guidelines and standards to make buildings more energy efficient. EPCA, through its 1978 amendments in the National Energy Conservation Policy Act,[132] suggested minimum standards for energy consumption in commercial and residential buildings. The 1992 Energy Policy Act superseded EPCA and asked states to establish minimum energy codes for buildings that met or exceeded voluntary baselines designated by tangible, existing energy codes: the Council of Building Officials Model Energy Code for residential buildings and the American Society for Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) Standard 90.1-1989 for commercial buildings.[133] Currently, such standards are set by the International Energy Conservation Council (IECC) for residential buildings and by ASHRAE for commercial buildings.[134] The Energy

125. Pub. L. No. 94–385, title III, 90 Stat. 1144 (1976) (codified as amended at 42 U.S.C. 6831 et seq.).

126. Pub. L. No. 94–385, 90 Stat. 1125 (1976) (codified as amended at 42 U.S.C. 6831 et seq.).

127. Pub. L. No. 95–619, 92 Stat. 3206 (1978) (codified as amended at 42 U.S.C. 8201 et seq.).

128. Pub. L. No. 102–486, 106 Stat. 2776 (1992).

129. Pub. L. No. 109–58, 119 Stat. 594 (2005).

130. Pub. L. No. 110–140, 121 Stat. 1492 (2007).

131. Pub. L. No. 111–5, 123 Stat. 115 (2009).

132. Pub. L. No. 95–619, 92 Stat. 3206 (codified as amended at 42 U.S.C. 8201 et seq.).

133. *See* Pub. L. No. 102–486, 106 Stat. 2776 (1992).

134. *See Commercial Code Development*, U.S. DEP'T OF ENERGY, http://www.energycodes.gov/development/commercial (last updated Nov. 19,

Policy Act of 2005[135] provided major incentives in tax credits and deductions to improve energy efficiency in existing or new buildings.[136] Yet, there is no federal mandate for energy efficiency for new commercial or residential buildings.[137]

As a voluntary CSR initiative, LEED is an internationally recognized green building certification process developed by the United States Green Building Council (USGBC).[138] The LEED Green Building Rating System is a "voluntary, consensus-based tool, which serves as a guideline and assessment mechanism for the design, construction, and operation of high-performance, green buildings and neighborhoods."[139] Through the optimization of natural resources, and promotion of regenerative and restorative techniques, LEED sets the standard for design and construction of green infrastructure.[140]

LEED is used for new construction and existing buildings.[141] The LEED Green Building Rating System is the most widely used system in America to gauge whether or not a building has attained a level of overall cost-efficient and environmentally sensitive performance.[142] The LEED Green Building Rating System operates as a checklist of criteria: The more criteria elements a building has successfully attained, the more points it scores; the higher the building's score, the

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2013); *Residential Code Development*, U.S. DEP'T OF ENERGY, http://www.energycodes.gov/development/residential (last updated Nov. 19, 2013).

135. 42 U.S.C. §§ 15801, et seq. (2006).

136. *Id.*

137. *Id.*

138. *LEED*, U.S. GREEN BLDG. COUNCIL, http://www.usgbc.org/leed (last visited Dec. 3, 2013).

139. U.S. GREEN BLDG. COUNCIL BOARD OF DIRS, FOUNDATIONS OF LEED 3 (2009), http://www.usgbc.org/sites/default/files/Foundations-of-LEED.pdf.

140. *Leed and Green Building Codes*, U.S. GREEN BLDG. COUNCIL, http://www.usgbc.org/Docs/Archive/General/Docs9246.pdf (last visited Dec. 3, 2013).

141. *LEED Rating Systems*, U.S. GREEN BLDG. COUNCIL, http://www.usgbc.org/leed/rating-systems (last visited Dec. 3, 2013).

142. *See* Kevin Wilcox, *GSA Issues Recommendations On Green Ratings Systems*, CIV. ENGINEERING (Nov. 5, 2013), http://www.asce.org/cemagazine/Article.aspx?id=23622328522#.UqDVW-L8mno; Marisa Long, *LEED Green Building Program Remains Preferred Rating System for Use in Federal Buildings*, U.S. GREEN BLDG. COUNCIL (Oct. 25, 2013), http://www.usgbc.org/articles/leed-green-building-program-remains-preferred-rating-system-use-federal-buildings.

higher the building's rating.[143] Points are available in the following categories:

- "Sustainable Sites" (26 possible points, one prerequisite)
- "Water Efficiency" (10 possible points, one prerequisite)
- "Energy and Atmosphere" (35 possible points, three prerequisites)
- "Materials and Resources" (14 possible points, one prerequisite)
- "Indoor Environmental Quality" (15 possible points, two prerequisites)
- "Innovation in Design" (6 possible points, no prerequisites)
- "Regional Priority" (4 possible points, no prerequisites)[144]

There are separate rating systems for core and shell development, new construction and major renovations, retail, schools, healthcare, homes, neighborhood development and commercial interiors.[145] To be eligible for LEED Certification, certain Minimum Program Requirements (MPRs) must be satisfied.[146] Critics have called the USGBC a form of shadow government because "green building standards are drafted, approved and administered by a private company that is neither under government control nor accountable to the electorate."[147]

LEED is endorsed by the United States Federal Government and several local and municipal governments. Some government

143. *See* U.S. GREEN BLDG. COUNCIL, LEED 2009 FOR NEW CONSTRUCTION AND MAJOR RENOVATIONS, at xiii (2008).

144. *Id.* at vi–vii.

145. *LEED Rating Systems,* U.S. GREEN BLDG. COUNCIL, http://www.usgbc.org/leed/rating-systems (last visited Dec. 3, 2013).

146. *Minimum Program Requirements*, U.S. GREEN BLDG. COUNCIL, http://www.usgbc.org/Docs/Archive/General/Docs6715.pdf (last updated Jan. 2011).

147. Graham Grady et al., *Government "Green" Requirements and "LEEDigation*,*"* 40 REAL EST. L.J. 496, 503–04 (2012).

authorities adopted the LEED standards into their building codes. As of 2008, "there were 134 mandatory government green building programs in addition to [eighty-five] voluntary programs in 118 counties, municipalities and districts in the United States."[148] In January 2007, Boston became the first major municipality to require private—not just government—new building construction to follow the USGBC's LEED standards.[149] The District of Columbia followed Boston with an ordinance using LEED as the standard applicable to all new construction or substantial improvement of non-residential, privately owned property with 50,000 square feet of floor space or more.[150] States including Rhode Island, Connecticut, Maryland, Nevada and Hawaii have enacted state-wide green building codes requiring LEED Silver certification or higher on certain qualified projects. Such initiatives with new buildings, where corporations can achieve different levels of efficiency, are becoming a metric for CSR for the common item shared by all corporations—buildings.

IV. CSR AND DOMESTIC ENERGY USE

The importance of the electric sector to the modern industrial economy is reflected in its changing role. In 1949, only eleven percent of global warming gases in the United States came from the electric sector; more recently is more than one-third.[151] The Energy Information Administration in 2008 concluded that the electric power sector offered the most cost-effective opportunities to reduce CO_2

148. KATE BOWERS & LEAH COHEN, HARV. L. SCH. ENVTL. L. & POL'Y CLINIC, THE GREEN BUILDING REVOLUTION: ADDRESSING AND MANAGING LEGAL RISKS AND LIABILITIES 4–5 (2009), http://dvgbc.org/sites/default/files/resources/Green%20Building%20Revolution.pdf.

149. Bradford Swing, *Project-Based Policy Development: Building the Case for Boston's Green Building Policy*, 11 N.Y.U. J. LEGIS. & PUB. POL'Y 33, 33 (2007).

149. *See Washington, D.C. Enacts Green Building Requirements for Private Projects*, CONSTRUCTION WEBLINKS (Apr. 16, 2007), http://www.constructionweblinks.com/resources/industry_reports__newsletters/Apr_16_2007/wash.html.

150. *Id.*

151. *See* U.S. ENERGY INFO. ADMIN., ENERGY-RELATED CARBON DIOXIDE EMISSIONS FROM THE RESIDENTIAL AND COMMERCIAL SECTORS, BY FUEL TYPE, 1949–2007 (2007), *available at* http://www.eia.doe.gov/oiaf/1605/ggrpt/excel/historical_co2.xls.

emissions, compared to the transportation sector.[152] Fossil fuel-fired power plants and petroleum refineries collectively emit nearly forty percent of our national GHG emissions—significantly more than the twenty-eight percent emanating from the transportation sector.[153]

Renewable energy is at the core of making CSR energy decisions within the existing structure. Even some leaders of the oil industry suggest that fifty percent of total energy demand in the world could be met by solar, wind and other renewable resources by 2050.[154] These benefits have been well documented.[155] A renewable energy economy would have national security benefits by reducing importation of fuels, as well by reducing the vulnerability of the electricity grid to terrorist attack.[156]

A. Distributed Generation and Efficiency

Corporations can utilize energy more efficiently, generate their own distributed generation, and do so from non-fossil fuel sources. Focusing just on building energy use in cities and individual energy conservation measures, the U.S. Congress Office of Technology Assessment forecast that by using existing technologies and feasible investments, seven Quads of energy annually could be saved through greater efficiency.[157] This large amount of energy is equivalent to an efficiency savings equal to the equivalent of more than half the energy consumption of these buildings.[158] Even greater savings in

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152. Charles Davis, *Energy Estimates Show Rise in CO_2 Emissions, Offer Mitigation Options*, CARBON CONTROL NEWS, June 30, 2008, at 20.

153. *See* David Biello, *EPA Plans Greenhouse Gas Emission Standards for Power Plants and Refineries*, SCI. AM., Dec. 23, 2010; *National Greenhouse Gas Emissions Data*, EPA, http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html (last updated Nov. 8, 2013).

154. JEREMY RIFKIN, THE HYDROGEN ECONOMY: THE CREATION OF THE WORLDWIDE ENERGY WEB AND THE REDISTRIBUTION OF POWER ON EARTH 189 (2002).

155. FERRY & CABRAAL, *supra* note 65, at 35–37.

156. ROSS GELBSPAN, BOILING POINT: HOW POLITICIANS, BIG OIL AND COAL, JOURNALISTS, AND ACTIVISTS HAVE FUELED A CLIMATE CRISIS—AND WHAT WE CAN DO TO AVERT DISASTER 176 (2004).

157. FERRY, LAW OF INDEPENDENT POWER, *supra* note 3, § 3:22. A Quad represents a quadrillion BTU of energy.

158. *Id.*

delivered energy could result from utility system load shaping, known as Demand Side Management ("DSM").[159]

The Environmental Protection Agency has determined that energy efficiency reductions can be made at approximately half the cost that new generation can be implemented, making energy efficiency a cost-effective solution for utilities looking to reduce their GHG production.[160] New England concluded that the $10 million paid to demand response programs yielded savings of more than three times this amount in lower cost of energy due to the second-priced auction run by grid operators in New England and elsewhere.[161] One ambitious estimate claims that if all cost-effective energy efficiency measures were implemented by 2025 these measures alone would meet fifty percent of the expected load growth and achieve over $500 billion in net savings.[162] EPRI estimates that energy efficiency programs have the potential to reduce the annual electricity use growth rate by twenty-two to thirty-six percent from 2008 to 2030, yielding an approximately five percent reduction in total U.S. 2030 electricity consumption.[163]

FERC undertook a rulemaking to ensure that demand-side resources are treated equally in wholesale market payments for capacity provided.[164] FERC has also issued several orders to enable and encourage the participation of demand response in electricity

159. *Id.* (discussing load shaping alternatives).

160. *See* U.S. DEP'T OF ENERGY & EPA, NATIONAL ACTION PLAN FOR ENERGY EFFICIENCY (2006), http://www.epa.gov/cleanenergy/documents/suca/napee_report.pdf.

161. Craig Cano, *Load Response Programs Save Three Times More than They Cost, ISO-NE Report Says*, ELECTRIC UTIL. WK., Jan. 10, 2011, at 23.

162. U.S. DEP'T OF ENERGY & EPA, NATIONAL ACTION PLAN FOR ENERGY EFFICIENCY VISION FOR 2025: A FRAMEWORK FOR CHANGE, at ES–2 (2008), http://www.epa.gov/cleanenergy/documents/suca/vision.pdf.

163. O. SIDDIQUI, ELECTRIC POWER RESEARCH INST., ASSESSMENT OF ACHIEVABLE POTENTIAL FROM ENERGY EFFICIENCY AND DEMAND RESPONSE PROGRAMS IN THE U.S. (2010–2030), at xx (2009), http://www.isa.org/FileStore/Intech/WhitePaper/EPRI.pdf.

164. Notice of Proposed Rulemaking, Demand Response Compensation in Organized Wholesale Energy Markets, 130 FERC ¶ 61,213 (proposed Mar. 18, 2010) (to be codified at 18 C.F.R pt. 35).

markets.[165] In New England's ISO-NE long-term capacity market, between 2005 and 2009, demand response resources were offered to the grid and accepted by the grid as a means to satisfy regional energy generation capacity requirements increased 556%. There were proposed charges in National Emission Standards for Hazardous Air Pollutants (NESHAPs)[166] and NSPS[167] in 2012 to allow on-site distributed generation to operate up to 100 hours annually for emergency demand reduction responses (including non-emergency purposes), and within that 100 hours up to fifty hours annually for peak-shaving purposes through April 16, 2017, as set forth in Table 5.[168]

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165. FERC issued Order No. 719 in October 2008 to address barriers to demand response participation in ISO and RTO markets. Order No. 719, Final Rule on Wholesale Competition in Regions with Organized Electric Markets, 125 FERC ¶ 61,071 (Oct. 17, 2008). Order No. 719 required system operators to accept bids from qualified demand response resources and allowed aggregators to bid demand response directly into the markets. The participation of aggregators has enabled a larger segment of the commercial, industrial, and institutional markets to participate in demand response programs. *Id.* Order No. 745, which amended Commission regulations to require that demand response resources be allowed to participate in and receive compensation from competitive electricity markets in the same manner as generation resources: "a demand response resource participating in an organized wholesale energy market must be compensated for the service it provides at the market price for energy when the demand response resource has the capability to balance supply and demand as an alternative to a generation resource and when the dispatch of demand response resource is cost-effective." Order No. 745, Final Rule on Demand Response Compensation in Organized Wholesale Energy Markets, 134 FERC ¶ 61,187 (Mar. 15, 2011). PJM, California ISO, and Southwest Power Pool filed tariff revisions in compliance with Order No. 745 in 2011, and ISO New England, New York ISO, and the Midwest ISO submitted Order No. 745 compliance filings in 2011. FED. ENERGY REGULATORY COMM'N, ASSESSMENT OF DEMAND RESPONSE & ADVANCED METERING: STAFF REPORT, 14 (2011), http://www.ferc.gov/legal/staff-reports/11-07-11-demand-response.pdf. There is an ongoing battle as to whether paying demand response resources the market price for capacity, when they cut back on consumption rather than invest in generation resources, is overcompensation.

166. 40 C.F.R. pt. 63, subpt. ZZZZ (2010).

167. *See* 40 C.F.R. pt. 60, subpt. IIII (2010); 40 C.F.R. pt. 60, subpt. JJJJ (2010).

168. *See* MELANIE KING & HEATHER VALDEZ, EPA, PROPOSED AMENDMENTS: STATIONARY ENGINE NESHAP AND NSPS 9 (2012), http://www.epa.gov/airtoxics/ZZrice/2012_06_amendments.pdf.

Table 5: Emergency Engine Requirements[169]

Category	Current Regulations		Proposed Amendments	
	RICE NESHAP	CI/SI ICE NSPS	RICE NESHAP	CI/SI ICE NSPS
Emergencies	No limit	No limit	No limit	No limit
Maintenance & Readiness Testing and Emergency Demand Response (EDR)	100 hours, of which 15 can be used for EDR in emergency situations (no maintenance/testing limit and no allowance for emergency demand response if engine is >500 HP at a major source installed prior to June 12, 2006)	100 hours No allowance for EDR operation	100 hours EDR must be in emergency situations	100 hours EDR must be in emergency situations
Non-Emergencies	50 hours Counts as part of the 100 hr/yr maintenance/EDR limit No peak shaving or operation through financial arrangement (except demand response)	50 hours Counts as part of the 100 hr/yr maintenance limit No peak shaving or operation through financial arrangement	50 hours Counts as part of the 100 hr/yr maintenance/EDR limit No peak shaving or operation through financial arrangement (except demand response), except peak shaving allowed for existing RICE at area sources through April 16, 2017	50 hours Counts as part of the 100 hr/yr maintenance/EDR limit No peak shaving or operation through financial arrangement (except demand response)

A study by the U.S. Department of Energy found the potential for 135,000 MW of additional cogeneration at industrial facilities, while the National Renewable Energy Laboratory found an additional 64,000 MW that could be recovered from industrial waste energy recovery.[170] Much more efficiency could be captured in the industrial sector than in the residential sector which attracts more attention.[171] Trading competitors, including Japan, Germany, France, Russia, and Denmark recycle a much larger percentage of their energy than does the United States. [172]

Cogeneration of electric power and usable heat by facilities on the customer sides of the meter and grid can be more efficient than conventional power generation.[173] By generating both usable heat and power (cogeneration or combined heat and power), factories and

169. *Id.*

170. Richard Munson, *The Missing Efficiency*, 23 ELECTRICITY J. 79 (2010).

171. *Id.*

172. *Id.*

173. Steven Ferrey, *Exit Strategy: State Legal Discretion to Environmentally Sculpt the Deregulating Electric Environment*, 26 HARV. ENVTL. L. REV. 109, 118 (2002) [hereinafter Ferrey, *Exit Strategy*]; for a treatment of dispersed generation, see FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, § 10:144.

corporations can save money and significantly increase efficiency.[174] Systems already in place worldwide raised their total plant efficiency rates by fifty to seventy percent, and in some cases even up to ninety percent.[175]

Cogeneration can use any means for the production of electricity.[176] It avoids the use of transmission and distribution networks, thus avoiding about one-half of the retail charge for conventional power supply.[177] The total energy produced by the system exhibits much higher efficiency under the first and second laws of thermodynamics.[178] There also can be environmental advantages.[179] This efficiency and regulatory savings are making this an attractive option to many consumers. Self-generation can be from renewable resources, such as solar photovoltaic production.

Generating power at one's corporate site, whether or not done with renewable or conventional generation, can have significant financial and energy efficiency advantages for a corporation. Distributed generation generally refers to small-size power generation on the customer's side of the utility meter. The financial advantages come from avoiding that portion of the utility bill that is for other than the generation of the power itself. The efficiency advantages occur from productively using on-site energy that is turned into waste heat from the centralized generation of power.[180]

The implications of generating energy at or near the point where it is used, and exporting any surplus to the grid, generally increases efficient use of energy because waste heat can be utilized, and less use of land resources results because existing land is used for power generation.[181] Smaller-scale renewable projects have the advantage of

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174. LESTER R. BROWN ET AL., SAVING THE PLANET: HOW TO SHAPE AN ENVIRONMENTALLY SUSTAINABLE GLOBAL ECONOMY 39 (1991).

175. *Id.*

176. FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, § 4:17–4:18 (providing a definition of small power producers under federal law).

177. Ferrey, *Exit Strategy*, *supra* note 173, at 120. Ferrey, *Virtual "Nets" and Law*, *supra* note 76, at 273 (as much as two-thirds of retail power costs can be comprised of other than the cost of wholesale power supplied to the consumer).

178. Ferrey, *Exit Strategy*, *supra* note 173, at 119.

179. *Id.* at 121–22.

180. FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, § 2.3.

181. STEVEN FERREY, ENVIRONMENTAL LAW: EXAMPLES & EXPLANATIONS, 565 (6th ed. 2006) [hereinafter FERREY, EXAMPLES AND EXPLANATIONS].

being able to be located on disturbed land and are less likely to require transmission upgrades.[182]

Solar energy is the source of all energy on the surface of the earth: creating wind and water movement and ultimately creating plants,[183] biomass, and animals that become fossil fuels when their organic matter decays. Many large retail chain stores are putting solar panels on their roofs, including (in descending order of most 2013 solar use): Wal-Mart, Costco, Kohl's, IKEA, Macy's, McGraw-Hill, Johnson & Johnson, Staples, Campbell's Soup, and Walgreens.[184] The amount of solar power capacity per company ranged from eight to sixty-five MW among the 5,700 MW of installed solar capacity in the United States.[185] Wal-Mart is seeking to supply 100% of its energy needs with on-site solar power.[186] Solar energy use is now an important market of CSR.

There are substantial tax benefits available for a variety of corporate investments in sustainable technologies that generate power, conserve energy, and/or accomplish transportation of corporate employees or corporate product.[187] There are significant

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182. Lisa Weinzimer, *CPUC Approves 'Least-Cost' Renewables Auction Intended to Ramp-Up Procurement*, ELECTRIC UTIL. WK., Dec. 20, 2010, at 16.

183. Plants are a significant source of energy. Photosynthesis is an endothermic reaction requiring 2.8 MJ of solar radiation to synthesize one molecule of glucose from six molecules of CO_2 and H_2O. VACLAV SMIL, ENERGIES: AN ILLUSTRATED GUIDE TO THE BIOSPHERE AND CIVILIZATION 42 (1999). Most of the terrestrial phytomass productivity in storage is in large trees in forests; phytoplankton species in the oceans store this mass in the hydrologic cycle. *Id*. at 46, 48. Phytoplankton productions are sixty-five to eighty percent of the terrestrial phytomass total, but phytoplankton has a life span of only one to five days. *Id.* at 48. The most voluminous trees are the most massive life forms on earth, with the most phytomass, and are even larger than blue whales in mass. *Id.* at 51. Tropical forests use available nutrients rather inefficiently. *Id.*

184. Gail Roberts, *Retail Industry Sees Bright Future with Solar at More Big Stores as Panel Prices Plummet*, ELECTRIC UTIL. WK., Oct. 29, 2012, at 20.

185. *Id.*

186. *Id.*

187. FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, §§ 3:19, :53, :109, tbls.3.13–.15. The Energy Information Administration in 2008 concluded that the electric power sector offered the most cost-effective opportunities to reduce CO_2 emissions, compared to the transportation sector. Fossil fuel-fired power plants and petroleum refineries collectively emit nearly forty percent of our national GHG emissions—significantly more than the twenty-eight percent emanating from the

existing incentives for corporate investments in sustainable renewable energy, either for one's own use or as a corporate investment.[188] In addition to federal tax incentives, there are specialized state incentives that have been created.

B. State Incentives for CSR

Thirty-five states implement ratepayer-funded energy efficiency programs with a budget of $3.1 billion in 2008, the most recent year surveyed.[189] Over the past twenty years, utility ratepayers, perhaps unknowingly, have funded energy efficiency investments: budgets have been up to one percent of revenues from utility retail sales, with annual savings of about 0.5% of retail sales. This is expected to rise to $5.4 to $12 billion annually by 2020.[190] States have sculpted sustainable energy policy around several legal and policy initiatives: renewable portfolio standards in sixty-five percent of states, renewable system benefit charges in thirty-three percent of states, and net metering in eighty-five percent of states.

1. RPS

Renewable Portfolio Standards (RPS) require electric utilities and other retail electric providers to include a specified percentage of electricity supply from renewable energy sources.[191] Twenty-nine states and the District of Columbia have some form of RPS.[192] These mandatory RPS programs cover about half of nationwide retail electricity sales.[193] RPS programs have been characterized as a form of back-door renewable subsidies.[194]

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transportation sector. *See* Biello, *supra* note 153; *National Greenhouse Gas Emissions Data*, *supra* note 153.

188. FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, §§ 3:19, :53, :109 tbls.3.13–.15.

189. Galen Barbose et al., *The Shifting Landscape of Ratepayer-Funded Energy Efficiency in the U.S.*, 22 ELECTRICITY J. 29, 29 (2009).

190. *Id.*

191. *See* Database for Sate Incentives for Renewables & Efficiency*, DSIRE Solar Policy Guide: A Resource for State Policymakers*, Sept. 2012, at 57, http://www.dsireusa.org/solar/solarpolicyguide/SolarPolicyGuide_final.pdf.

192. *Id.* at 58.

193. RYAN WISER & GALEN BARBOSE, LAWRENCE BERKELEY NAT'L LAB., RENEWABLES PORTFOLIO STANDARDS IN THE UNITED STATES: A STATUS REPORT

RPS programs have had an impact as a policy tool. Over fifty percent of the non-hydro renewable capacity additions in the United States for the decade from 1998 through 2007 occurred in states with RPS programs; ninety-three percent of these additions came from wind power, four percent from biomass, two percent from solar, and one percent from geothermal resources.[195] The required state percentage of energy delivered currently from renewables ranges from two to forty percent of annual retail sales in different state programs, but these numbers can be deceiving depending upon whether preexisting renewable resources are eligible to be counted.[196] In order to comply with the RPS requirements, electric utilities can purchase Renewable Energy Credits (RECs) from corporate eligible renewable generation. The RECs exist as a separate commodity to be traded and transferred, if so allowed by the state.[197]

There are a number of the twenty-nine states with RPS that have incorporated credit multipliers, restrictions or preferences to promote in-state/in-region generation of power. They constitute about three-quarters of those states with RPS programs:[198]

Eight of the twenty-nine RPS states, or twenty-seven percent, have REC multipliers for in-state generation; four of the RPS states, or fourteen percent of the RPS states, including two that also provide for a geographically discriminatory REC multiplier, have either a requirement or preference for in-state generation

In April 2010, Massachusetts was sued by TransCanada alleging Commerce Clause violations in its requirement that state utilities enter long-term contracts with in-state new renewable energy projects, and that solar renewable energy credits be earned by in-state

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WITH DATA THROUGH 2007, at 1 (2008), http://emp.lbl.gov/sites/all/files/REPORT%20lbnl-154e-revised.pdf.

194. Robert Glennon & Andrew M. Reeves, *Solar Energy's Cloudy Future*, 1 ARIZ. J. ENVTL. L. & POL'Y 91, 106 (2010).

195. WISER & BARBOSE, *supra* note 193, at 1.

196. *See* Database for Sate Incentives for Renewables & Efficiency, *Renewable Portfolio Standard Policies*, Mar. 2013, http://www.dsireusa.org/documents/summarymaps/RPS_map.pdf

197. *See Renewable Energy Certificates (RECs)*, EPA, http://www.epa.gov/greenpower/gpmarket/rec.htm (last updated Oct. 16, 2012).

198. Twenty-two of twenty-nine RPS states have one or another form of geographic discrimination.

solar photovoltaic power projects.[199] Massachusetts immediately settled this lawsuit rather than risk having its programs exposed to constitutional scrutiny by the federal courts handling this complaint.[200]

2. System Benefits Charges

A system benefits charge (SBC) is a per-kWh power charge imposed on all electricity consumers within a state. Approximately one-third of U.S. states have enacted SBC and "public benefit funds" as a direct subsidy mechanism to support the development of renewable energy resources.[201] Fifteen states and the District of Columbia have established renewable trust funds in the United States.[202] The money then can be given as grants or loans to companies that adopt renewable energy technology. Some states raise revenues for these renewable trust funds through a small surcharge on electricity bills.[203] In this way, SBC provides another incentive for CSR in energy.

In a distinct constitutional suit against the state of New York's Regional Greenhouse Gas Initiative program (which also includes ten northeast states), New York quickly settled and had Consolidated Edison Company and its ratepayers agree to pay the cogeneration project for the cost of its additional carbon allowances through the end of their pre-existing long-term contracts.[204] In addition to the Indeck project, the Brooklyn Navy Yard Co-Generation Project and

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199. Erin Ailworth, *State Looking to Settle Suit over Law on Clean Energy*, BOS. GLOBE (May 27, 2010), http://www.boston.com/business/articles/2010/05/27/lawsuit_hits_mass_law_promoting_local_energy_providers.

200. *See* Partial Settlement Agreement, TransCanada Power Mktg. Ltd. v. Bowles, No. 4:10-cv-40070-FDS, (D. Mass. 2010), *available at* http://www.mass.gov/eea/docs/doer/renewables/solar/settlement-agreement.pdf.

201. ELIZABETH DORIS ET AL., NAT'L RENEWABLE ENERGY LAB., STATE OF THE STATES 2009: RENEWABLE ENERGY DEVELOPMENT AND THE ROLE OF POLICY 65–66 (2009), http://www.nrel.gov/docs/fy10osti/46667.pdf.

202. *Public Benefits Funds for Renewables*, DATABASE ST. INCENTIVES FOR RENEWABLES & EFFICIENCY (Feb. 2011), http://www.dsireusa.org/documents/summarymaps/PBF_Map.pdf.

203. *Id.* at 2.

204. *See* Consent Decree, Indeck Corinth, L.P. v. Paterson, No. 5280-09 (N.Y. Sup. Ct. 2010), at ¶ 5–6, *available at* http://op.bna.com/hl.nsf/id/thyd-7z2nhd/$File/Corinth%20v%20Patterson%20-%20RGGI.pdf.

Selkirk Cogen Partners also received complete settlements with all corporate economic impact shifted to the utility and/or its ratepayers.[205]

3. Net Metering

Net metering is the most utilized state incentive for renewable power nationwide, in place in more than eight-five percent of the states. Net metering is an accounting concept typically applied to renewable sources of distributed power self-generated on the utility customer's side of the utility meter.[206] If net metered, the distributed power generation unit is connected to a retail bi-directional meter that measures the amount of total energy used and produced by the customer. When the customer uses electricity from the distribution company, the meter runs forward; when more electricity is produced from the facility than is consumed by the customer, the excess is sent to the electricity grid, running the meter in reverse direction.[207]

By turning the meter backwards, net metering effectively compensates the generator at the full retail rate (which includes approximately two-thirds of the retail bill that is attributable to transmission, distribution, and taxes) for transferring just the wholesale energy commodity—the power itself. This multiplies by several-fold the effective value or revenue earned from the power sale. While most states compensate the generator for excess generation at the avoided cost or market-determined wholesale rate, some states compensate the wholesale energy seller for the excess power at the much higher, retail rate.

Net metering operates as an incentive, applied to renewable power sources or combined heat and power units built on the site of the customer. All utilities in all states have been required by federal law for the past six years to make net metering available to all requesting customers.[208] Each of the forty-three state net metering programs is

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205. *Id.*

206. *Glossary*, DATABASE FOR ST. INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/glossary (last visited Dec. 3, 2013).

207. *Id*.

208. *Net Metering Map*, DATABASE FOR ST. INCENTIVES FOR RENEWABLES & EFFICIENCY (July 2013), http://www.dsireusa.org/documents/summarymaps/net_metering_map.pdf.

distinct. There are differences as to allowable sizes of units, the vintage and longevity of credits, whether credits can be cashed out, eligible classes of customers, and eligible technologies.[209]

Some states that allow net metering put a limit on the percentage of total power that can be net metered, to avoid the problem of net metering power back to the utility when the utility does not need the power.[210] Net metering makes a cross-subsidy from all ordinary consumers to net-metered customers; this raises an equity issue for the immediate future. Massachusetts has a "virtual net metering" that is more far-reaching than the other states.[211] With this expansive permission for net metering, net metering credits which have a value in the vicinity of 300% of the daily settling price of wholesale power in the New England region can be transferred to other customers in the utility service territory.

In Rhode Island, there was a challenge to net metering where the wind generator at the Portsmouth High School was directly interconnected to the distribution grid, rather than first serving a substantial host load at the school.[212] The concern was whether, as an independent wholesale project, the net metered generation can be paid an amount more than the avoided cost afforded to Qualifying Facilities under PURPA,[213] a preemptive federal statute regulating

209. *See infra* Part III.B.3.

210. Mary Powers, *Maryland Regulatory Staff Takes Side of Solar Producers on Net Metering Issues*, ELECTRIC UTIL. WK., Aug. 16, 2010, at 24.

211. Massachusetts net metering was originally created by order of the Massachusetts Department of Public Utilities in 1982. *Massachusetts Net-Metering Rules*, EPA, http://www.epa.gov/chp/policies/policies/mamassachusettsnetmeteringrules.html (last updated Nov. 20, 2013). In 1997, the Department of Telecommunications and Energy amended the net metering program to increase the allowable capacity from thirty to sixty kW for all renewable technologies, and larger for certain solar, wind, and agricultural renewable technologies. *Massachusetts Incentives/Policies for Renewables & Efficiency*, DATABASE FOR ST. INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=MA01R (last updated Jan. 31, 2013).

212. *See Docket No. D-10-126—Division of Public Utilities and Carriers' ("Division") Investigation Into Net Metering Complaint Relating to the Town of Portsmouth Wind Generating Facility*, R.I. PUB. UTIL. COMM'N, http://www.ripuc.org/eventsactions/docket/D-10-126page.html (last updated Aug. 29, 2013).

213. 16 U.S.C. § 824a–2 (2006).

wholesale renewable power sales, rather than the much higher state net metered calculation. There are two cases that have created questions about whether net metering can apply to generators who export more power than they import,[214] and pending challenges to such arrangements have been initiated.[215]

4. CSR Challenges to State Energy Policies

There are two important CSR aspects regarding the three incentive mechanisms to promote CSR renewable energy investment, available to some degree or another in almost all the states. First, these can be important incentives for CSR within the confines of existing corporate space use and business activities. They are there, and they provide important, if often overlooked, incentives.

Second, each of these three incentives shares something in common: all invisibly transfer, with no denotation on the consumer bill, costs from all nonparticipating ratepayers to those ratepayers who take advantage of these incentives. Net metering subsidizes designated renewable on-site generation by allowing it to utilize the distribution system to store electric energy without paying any pro rata per kWh cost for this distribution and storage service. This power can be reclaimed at any time by the original producer, again without paying any share of the costs of the distribution system that redelivers this power to the generator/consumer. Since distribution and transmission expenses can be approximately two-thirds of total retail electricity costs,[216] this fictional storage allows the renewable energy project to move and later use power at less than half the cost to the utility system performing this function, as rate tariffs allocate costs. This loss of revenue to the utility, by not recovering the expected or forecast number of units of transmission and distribution system operation, results in higher rates to other customers to cover the fixed costs of the system operation.[217]

Renewable portfolio standards subsidize designated renewable energy technologies by creating a new tradable virtual renewable

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214. *Sun Edison LLC*, 129 FERC ¶ 61,146 (2009); *MidAmerican Energy Company*, 94 FERC ¶ 61,340 (2001).

215. *See Docket No. D-10-126*, *supra* note 212.

216. Ferrey, *Virtual "Nets" and Law*, *supra* note 76, at 273.

217. *Id.* at 303.

energy certificate and simultaneously imposing a regulatory requirement on state utilities and their ratepayers constantly to purchase a specified number of those certificates from the private project. Therefore, there is a new expense imposed on the utilities and passed on to utility ratepayers, which cash amounts are transferred to operators of renewable energy projects.

Renewable system benefit charges raise direct subsidies that can be dispensed by state government to specified private electric power development facilities. These amounts are collected through the public regulatory system, and then dispersed discretionarily to private power projects. This works a cross-subsidy though this regulatory mechanism.

Although certain consumers are starting to take notice, this inter-customer transfer, as well as the inter-customer transfer within rate classes discussed later, together constitutes important precedent. There is not space to devote any detail to challenges under the Supremacy Clause of the Constitution and the Filed Rate Doctrine; these are discussed elsewhere: I have elsewhere covered these challenges to Renewable Portfolio Standards,[218] System Benefit Charges,[219] and net metering,[220] as well as legal challenges to state climate control[221]and feed-in tariffs.[222] There are very real and to-date successful pending challenges to some of these incentives, based on Constitutional and other legal grounds, because they either discriminate based on the geography of power generation or states interfering with wholesale power sale rates in ways not consistent with the Public Utility Regulatory Policies Act.[223]

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218. Ferrey, *Threading the Constitutional Needle*, *supra* note 74; Steven Ferrey et al., *Fire and Ice: World Renewable Energy and Carbon Control Mechanisms Confront Constitutional Barriers*, 20 DUKE ENVTL. L. & POL'Y F. 125 (2010) [hereinafter Ferrey, *Fire and Ice*].

219. Steven Ferrey, *Follow the Money! Article I and Article VI Constitutional Barriers to Renewable Energy in the U.S. Future*, 17 VA. J.L. & TECH. 89 (2012).

220. *See generally* Ferrey, *Virtual "Nets" and Law*, *supra* note 76.

221. Steven Ferrey, *Goblets of Fire: Potential Constitutional Impediments to the Regulation of Global Warming*, 35 ECOLOGY L.Q. 835 (2008).

222. Ferrey, *Fire and Ice*, *supra* note 218; Steven Ferrey et al., *FIT in the USA*, PUB. UTIL. FORT., May 2010, http://www.fortnightly.com/print/14219.

223. 16 U.S.C. § 824a–2 (2006); *see* Ferrey, *Threading the Constitutional Needle*, *supra* note 74; Ferrey, *Fire and Ice*, *supra* note 218.

In certain states, these inter-customer transfers are not only legally permissible, but have a significant history.[224]

C. Traditional Cross-Subsidies in U.S. Utility Rates

Equity in utility rates is a multi-layered issue in U.S. states. In several states, rates for the provision of electricity are intentionally inequitable by design. Some states have permitted this, while other states have held that an identical sale of electricity must be offered on equal terms to all customers within a rate category at a nondiscriminatory price. This is the flip side of a normal inquiry, because the customer receiving the preference are the elderly or of low-income, while other corporations and individuals absorb the cost of the subsidy by paying more than the actual cost of their electric service.

1. Energy Rate Discount Variations

Regulations in about half of the states grant authority to public utility commissions to consider low-income discounts while the other half of the states do not. In one model, all low-income customers get the same percentage or discount. In another model, the discounts are tiered so the poorer customers get a larger discount based on their lower income. State regulatory commissions have developed straight discounts, tiered discount program, consumption-based discounts, and customer charge waivers.[225] These take a variety of forms.

Fourteen states provide targeted lifeline rates for low-income customers.[226] Utility companies provide a discount to eligible low-income customers for all or some of their electric utility bills.[227] However, no states provide a general lifeline rate to all residential customers.[228] Six states provide a straight percentage discount of the

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224. *See* Ferrey, *Threading the Constitutional Needle*, *supra* note 74, at 63, 66, 96; Ferrey, *Fire and Ice*, *supra* note 218, at 150.

225. CHARLES HARAK ET AL., ACCESS TO UTILITY SERVICE 163–71 (5th ed., 2011). Professor Ferrey acknowledges the research of his student, Jesse Gag, regarding this material.

226. *See* FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, § 10:17.

227. *See id*.

228. *Id.*

total bill,[229] as a specific percentage that is deducted from a customer's total bill.[230] Two states provide a straight percentage discount for the winter season.[231]

The tiered discount program offers discounts depending upon a customer's income or poverty level.[232] A consumption-based discount is set based on a customer's level of usage, to discourage over-consumption by a customer receiving a discounted price.[233] Massachusetts electric and gas distribution companies are required "[t]o provide discounted rates for low-income customers, with the cost of the discount program recouped from the rates charged to all other customers of the company."[234] In Massachusetts, anyone on any public assistance gets an automatic discount on his or her transmission and distribution costs on the utility bills.[235] Twenty-two million dollars was transferred on low-income discounts in Massachusetts in 1994.[236] The companies are permitted to recoup the revenue lost from the subsidies in the "access charges" charged to the bills of other customers of all classes.[237]

In other formats of cross-subsidy, seven states offer a percentage-income plan.[238] New Jersey offers the Lifeline program, which is a $225 flat credit to seniors, or disabled individuals, or low-income customers which have electric and gas costs included in their rent.[239] Two states provide discounts for low-income customers through

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229. *Id.*

230. HARAK ET AL., *supra* note 225, at 163.

231. *See* FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, § 10:17.

232. HARAK ET AL., *supra* note 225, at 167.

233. *Id.* at 169.

234. 36 Mass. Prac. *Consumer Law* § 27:20 (2012).

235. MASS. GEN. LAWS ANN. ch. 164, § 1F(4) (West 2013); *see also* STEVEN FERREY, THE NEW RULES: A GUIDE TO ELECTRIC MARKET REGULATION 341–42 (2000) [hereinafter FERREY, THE NEW RULES]; 36 Mass. Prac. *Consumer Law* § 27:20 (2012).

236. FERREY, THE NEW RULES, *supra* note 235, at 341.

237. FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, § 10:13; *see also* 36 Mass. Prac. *Consumer Law* § 27:20 (2012).

238. *See* FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, § 10:17.

239. *Assistance*, ST. OF N.J. BOARD PUB. UTIL., http://www.nj.gov/bpu/assistance/programs (last visited Dec. 3, 2013); *Lifeline Utility Assistance Program*, N.J. HEALTH LINK, http://www.state.nj.us/humanservices/doas/services/lua (last visited Dec. 3, 2013).

waiving only the customer charge,[240] which waives the relatively small fixed customer charge that covers billing and administrative costs on all residential bills.[241] Two other states offer bill arrearage forgiveness to certain customers.[242]

2. Legal Disputes on Discounted Retail Rates

Utilities recoup costs from required discounts through a charge imposed on their other customers' utility bills.[243] These increased costs may be imposed on the rest of residential customers whose energy use exceeds the initial block, or customers who have a certain level of income, or also on commercial and industrial class customers.[244] This is a zero-sum game: one's gain is the rest's loss dollar-for-dollar.

A public utility regulatory commission lacks the power to approve the collection of unjust, unreasonable, discriminatory, preferential, or prejudicial rates.[245] Depending on the language of the state constitution, the practice of discounted utility rates may violate applicable state equal protection clauses[246] of the applicable state constitutions.[247] It also is typical that customers who utilize electricity for heating their dwellings pay a different rate for electricity than those who do not. Larger-volume industrial and commercial customers often pay at a lower rate per unit of delivered power than do residential customers.[248] Utility rates should

240. HARAK ET AL., *supra* note 225, at 170–71.

241. *Id.*

242. *See* FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, § 10:17.

243. *Id.*; *see* FERREY, THE NEW RULES, *supra* note 235, at 341–42.

244. FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, § 10:17; *see also* City of Pittsburgh v. Pa. Pub. Util. Comm'n., 126 A.2d 777 (Pa. Super. 1956).

245. Nicole Fox et al., 73B C.J.S. *Public Utilities* § 32 (2013).

246. *See* RICHARD J. PIERCE, JR. & ERNEST GELLHORN, REGULATED INDUSTRIES IN A NUTSHELL 177–87 (1999).

247. FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, § 10:17; *see, e.g.*, Mtn. States Legal Found. v. Pub. Utils. Comm'n, 197 Colo. 56 (1979); Re Cent. Me. Power Co., 26 Pub. Util. Rep.4th (PUR) 388, 430 (1978); Pa. Pub. Util. Comm'n v. Phila. Electric Co., 91 Pub. Util. Rep.3d (PUR) 321, 373 (1971).

248. *See* FERREY, EXAMPLES AND EXPLANATIONS, *supra* note 181, at 570 tbl.12.4; *see* FERREY, THE NEW RULES, *supra* note 235, at 302 (noting that at the time of publication, in Massachusetts industrial customers pay 6.5–9.5 cents per

accurately reflect the cost of serving each customer class, rather than the individual within that class. [249]

3. Successful Challenges as Inequitable or Ultra Vires Discrimination

Pennsylvania's commission held that utility charges must be applied equally within the residential class and that offering a special rate to low-income and fixed-income customers constituted unconstitutional discrimination.[250] Indiana regulation prohibits utilities from charging different rates for customers who receive the "same service under the same circumstances."[251] A challenge against targeted lifeline rates that provided a below-cost electric rate for specific income or demographic customers was found to violate state statutes prohibiting undue discrimination.[252] The Colorado Supreme Court held that targeted lifeline rates for low-income customers were unconstitutional because they were unjustly preferential and discriminatory, contrary to legal prohibition of preferential rates.[253]

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kilowatt hour, commercial customers pay 5.5 to eleven cents per kilowatt hour and residential customers pay 10.5–13.5 cents per kilowatt hour on average).

249. FERREY, EXAMPLES AND EXPLANATIONS, *supra* note 181, at 583 (describing vertical and horizontal equity between and within rate classes); s*ee also* Order on Rehearing and Clarification, 67 FERC ¶ 61,168 (May 11, 1994), *clarified* 67 FERC ¶ 61,317 (June 15, 1994); Order No. 745, Final Rule on Demand Response Compensation in Organized Wholesale Energy Markets, 134 FERC ¶ 61,187 (Mar. 15, 2011).

250. *See Phila. Electric Co*., 91 Pub. Util. Rep.3d (PUR) at 373.

251. Citizens Action Coal., Inc. v. Pub. Serv. Co., 450 N.E.2d 98, 101 (Ind. Ct. App. 1983). Ind. Code § 8–1–2–103(a) (2012) states:

> No public utility, or agent or officer thereof, or officer of any municipality constituting a public utility, as defined in this chapter, may charge, demand, collect, or receive from any person a greater or less compensation for any service rendered or to be rendered, or for any service in connection therewith, than that prescribed in the published schedules or tariffs then in force or established as provided herein, or than it charges, demands, collects, or receives from any other person for a like and contemporaneous service.

252. *Citizens Action Coal.*, 450 N.E.2d at 100.

253. Mtn. States Legal Found. v. Pub. Utils. Comm'n, 197 Colo. 56, 59–60 (1979).

In Rhode Island, the court ruled that the Rhode Island Public Utility Commission is not authorized to mandate preferential rates to elderly or poor customers without a grant of power from the legislature.[254] The Maine Public Utility Commission also found the reduced rate for elderly low-income customers to be unconstitutional.[255] The Commission held that the reduced rate was an inappropriate "social judgment."[256]

4. Discounts Upheld

Other state courts have reached contrary decisions. The Public Service Commission of Utah concluded that lifeline rates were legal[257] and in the public interest.[258] Massachusetts is the only state in which a discounted rate has been upheld by its highest court[259] for certain low-income elderly customers, "[a]s long as [the state energy regulatory commission's] choice does not have a confiscatory effect or is not otherwise illegal."[260] However, the DPU ordered that the costs of the discount be shared equally among all classes of customers including corporate commercial and industrial rates.[261]

And even beyond such price distinctions based on customer income or age, there are distinctions in many states based on amount of consumption. This occurs in two modes: First, in many states, customers who have more electricity- or gas-consuming equipment are afforded discounted rates because of their greater amount of equipment. Discounted rates are afforded to all-electric customers, who use electricity for water heating space heating, in addition to conventional lighting. Moreover, a number of states have inclining block rates, which increase rates for greater usage than a specified amount, to encourage more conservation of energy resources. In neither case, is the altered price justified by the cost of supplying the

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254. Blackstone Valley Chamber of Commerce v. Pub. Util. Comm'n, 121 R.I. 122, 125–27 (1979).

255. *See* Re Cent. Me. Power Co., 26 Pub. Util. Rep.4th (PUR) 388, 430 (1978).

256. *Id.*

257. *See In re* PacifiCorp, 192 Pub. Util. Rep.4th (PUR) 289, 289 (1999).

258. *Id.*

259. FERREY, LAW OF INDEPENDENT POWER, *supra* note 3, § 10:17; Am. Hoechest Corp. v. Dep't of Pub. Util., 379 Mass. 408 (1980).

260. *Am. Hoechest Corp.*, 379 Mass. at 413.

261. *Id.* at 410.

commodity. The price rewards certain conservative behavior or choice of equipment.

It is within the legal scope of existing ratemaking precedent to have differentiated rates for the same amount of power sold or for different types of consumers, regardless of any direct or indirect cross-subsidies.

V. FINAL THOUGHTS

The leading edge of CSR in the energy arena is different depending on whether one analyzes it in international or domestic frame. In an international context, the challenge is to cause developing countries to adopt renewable and low-carbon energy sources for their exploding demand for new electric generation.[262] The need to address the means to generate quickly expanding demand for power is urgent. There is a successful model, demonstrated in countries of every form of government from capitalist to communist, which has been shown to work and employs unassailable principles of justified development.[263] This is the socially responsible means to provide electricity internationally through low-carbon resource infrastructure.

The importance of the electric sector to the modern industrial economy is reflected in its changing role and its societal impacts. In 1949, only eleven percent of global warming gases in the United States came from the electric sector; today it is more than one-third.[264] The Energy Information Administration concluded that the electric power sector offered the most cost-effective opportunities to reduce CO_2 emissions, compared to the transportation sector.[265] We either succeed with energy, or we do not succeed with controlling climate change and global warming.

In a domestic market economy, we do this with incentives at the state or federal levels, to motivate corporate and individual behavior. In a domestic framework, CSR involves the demand or consumption side of the energy equation: Increased corporate and personal energy efficiency and renewable power use, including on-site distributed

262. *See supra* Part II.A–B.
263. *See supra* Part II.C.
264. *See* U.S. ENERGY INFO. ADMIN., *supra* note 151
265. Davis, *supra* note 152.

generation.[266] There are several federal and state incentives for such implementation.[267] These state incentives involuntarily cross-subsidize certain customers of the utility with revenues from other customers of the utility.[268] This article has highlighted that in some states there is a history of cross-subsidies in retail utility rates that are supposedly neutral to reflect the cost of service to supply power to each customer class.[269] The legality of both state renewable incentives and utility retail rate cross-subsidies are being challenged, with various results to date.[270]

The world needs to succeed with energy deployment in both domestic and international contexts. To do so, energy policy must equitably and responsibly address both demand and supply options for a lower carbon emission world. CSR is linked to each of these decisions regarding energy. The legal and policy challenges are more daunting than the availability of sustainable energy technology, itself. This article highlights key models and avenues to incentive and implement sustainable options for energy and metrics of success.

266. *See supra* Part III–IV.
267. *See supra* Part III–IV.
268. *See supra* Part IV.B.4–C.2.
269. *See supra* Part IV.B.4–C.2.
270. *See supra* Part IV.C.2.