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# Long-Term Contracting the Way to Renewable Energy Investment: Lessons from Brazil Applied to the United States

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# LONG-TERM CONTRACTING THE WAY TO RENEWABLE ENERGY INVESTMENT: LESSONS FROM BRAZIL APPLIED TO THE UNITED STATES


## ABSTRACT

*Fostering development of a renewable energy industry is critical to ensuring energy security and sustained economic development. The United States recently lost its status as global leader in new financial investment in renewable energy, while investment in renewable energy has increased in the developing world. For example, Brazil is the sixth largest investor in renewable energy and has moved up in renewable energy rankings. It is time for the United States to regain its leadership role and create a stable climate for renewable energy investment.*

*This Comment argues that the current legal framework in the United States is inefficient in stimulating continuous investment in electricity generation from renewable resources. The start-and-stop approach created by reliance on tax incentives, a patchwork of state laws, and the inability of many power producers to secure long-term power purchase agreements fail to provide potential investors with the long-term predictability they need. An examination of Brazil's legal framework for investment in renewable energy demonstrates that a mechanism that assures a certain return on investment over a long period of time is crucial to promote continuous investment in renewable energy projects and related industries.*

*This Comment ultimately recommends that the United States encourage more continuous investment in renewable energy by adopting a national renewable portfolio standard and requiring utilities to enter into long-term contracts with nonutility power producers through a competitive process to meet the requirement, unless a utility can meet it in a more cost-effective manner by generating the required amount of renewable energy itself.*

## TABLE OF ACRONYMS

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| ARRA: | American Recovery and Reinvestment Act |
| BNDES: | Brazilian National Development Bank |
| CONFAZ: | Brazilian National Council of Treasurers |
| FERC: | Federal Energy Regulatory Commission |
| FIT: | Feed-in Tariff |
| GHG: | Greenhouse Gas |
| ICMS: | Brazilian Sales Tax |
| IPP: | Independent Power Producer |
| ITC: | Business Energy Investment Tax Credit |
| kWh: | Kilowatt Hour |
| MME: | Brazilian Ministry of Mines and Energy |
| MW: | Megawatt |
| PPA: | Power Purchase Agreement |
| PNMC: | Brazilian Climate Change Policy |
| PROINFA: | Incentive Program for Alternative Sources of Energy |
| PTC: | Renewable Electricity Production Tax Credit |
| PURPA: | Public Utility Regulatory Policy Act |
| QF: | Qualifying Facility |
| REC: | Renewable Energy Credit |
| REIDI: | Brazilian Investment in Infrastructure Incentive Program |
| RPS: | Renewable Portfolio Standard |

## INTRODUCTION

As of 2010, the United States still relied on fossil fuels for about 81% of its primary energy requirements.[1] In contrast, renewable resources—those that "regenerate and can be sustained indefinitely"[2]—supplied about 8% of energy consumed and electricity generated in the United States.[3] Even though total new financial investment in renewable energy in the United States has been growing,[4] the overall increase in renewable energy generation has been small and unsteady.[5] Moreover, in recent years the United States lost to China the position of global leader in new, renewable energy investment[6] and, until May 2013, the position of most attractive country for renewable energy in Ernst & Young's quarterly Renewable Energy Country Attractiveness Indices.[7]

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[1] U.S. ENERGY INFO. ADMIN., DOE/EIA-0384(2011), ANNUAL ENERGY REVIEW 2011, at 5 tbl.1.1 (2012) [hereinafter ANNUAL ENERGY REVIEW 2011]. This compares with about 72% in 1978. *Id.*

[2] *Renewable Energy Explained*, U.S. ENERGY INFO. ADMIN., http://www.eia.gov/energyexplained/index.cfm?page=renewable_home (last updated May 25, 2012) (listing biomass, water (hydropower), geothermal, wind, and solar as the most used renewable resources).

[3] ANNUAL ENERGY REVIEW 2011, *supra* note 1, at 5 tbl.1.1. By comparison, in 1978 renewable resources supplied about 5% of energy consumed. *Id.*

[4] *See* UNITED NATIONS ENV'T PROGRAMME & BLOOMBERG NEW ENERGY FIN., GLOBAL TRENDS IN RENEWABLE ENERGY INVESTMENT 2012, at 15 fig.3 (2012) [hereinafter UNEP & BNEF 2012], *available at* http://fs-unep-centre.org/sites/default/files/publications/globaltrendsreport2012.pdf; UNITED NATIONS ENV'T PROGRAMME & BLOOMBERG NEW ENERGY FIN., GLOBAL TRENDS IN RENEWABLE ENERGY INVESTMENT 2011, at 18 (2011) [hereinafter UNEP & BNEF 2011], *available at* http://fs-unep-centre.org/sites/default/files/media/sefi2011finallowres.pdf. For example, new financial investment in renewable energy grew 58% to over $25 billion in 2010. UNEP & BNEF 2011, *supra*, at 9, 18 (including biofuel projects). In 2011, it grew 57% to $50.8 billion. UNEP & BNEF 2012, *supra*, at 15 fig.3.

[5] *See supra* note 3 and accompanying text; *cf.* 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, 100 (2012), http://www.vjolt.net/vol17/issue2/v17_i2_89-Ferrey.pdf ("All policy incentives have failed to substantially increase the deployment of renewable energy technologies on a percentage basis at the national scale.").

[6] *See* UNEP & BNEF 2012, *supra* note 4, at 15 fig.3 (showing the United States' 2011 new investment as $50.8 billion and China's as $52.2 billion); Barry Stevens, *Can Renewable Energy Survive in the U.S.?*, RENEWABLE ENERGY WORLD.COM (Oct. 25, 2011), www.renewableenergyworld.com/rea/news/article/2011/10/can-renewable-energy-survive-in-the-u-s.

[7] In February 2013, Ernst & Young ranked the United States third most attractive country for renewable energy, behind China and Germany. ERNST & YOUNG, ISSUE 36, RENEWABLE ENERGY COUNTRY ATTRACTIVENESS INDICES 16 (2013) [hereinafter ERNST & YOUNG FEB. 2013]. This represented a fall in the rankings over the past few years. From August 2010 to August 2012, the United States held second place in the same ranking. *See* ERNST & YOUNG, ISSUE 34, RENEWABLE ENERGY COUNTRY ATTRACTIVENESS INDICES 20 (2012) [hereinafter ERNST & YOUNG AUG. 2012]; ERNST & YOUNG, ISSUE 33, RENEWABLE ENERGY COUNTRY ATTRACTIVENESS INDICES 20 (2012) [hereinafter ERNST & YOUNG MAY 2012]; ERNST & YOUNG, ISSUE 32, RENEWABLE ENERGY COUNTRY ATTRACTIVENESS INDICES 14 (2012) [hereinafter ERNST & YOUNG FEB. 2012]; ERNST & YOUNG, ISSUE 31, RENEWABLE ENERGY COUNTRY ATTRACTIVENESS INDICES 13 (2011) [hereinafter ERNST & YOUNG NOV. 2011] (depicting the ranking for August 2011, as well, in parentheses next to the November 2011 ranking); ERNST & YOUNG, ISSUE 29, RENEWABLE ENERGY COUNTRY ATTRACTIVENESS INDICES 15 (2011) [hereinafter ERNST & YOUNG MAY 2011]; ERNST & YOUNG, ISSUE 28,

Slow growth of renewable energy in the United States has been attributed to various factors, including the following: high capital costs; low power purchase agreement (PPA) rates; inability to lock in long-term purchase agreements; regulatory hurdles; demise of key federal incentives; and erosion of Congress's support for subsidies.[8] Since 2008, a fall in natural gas prices has exacerbated these barriers by promoting the building of natural gas plants and depressing further contract terms for renewable energy projects.[9]

The United States' fall to China as global leader in new, renewable energy investment represented a trend of energy investment shifting toward developing countries.[10] In various regions of the developing world, investment in renewable energy has increased as governments strive to diversify their country's energy mix.[11] For example, in 2010, new financial investment in renewable energy in South and Central America, excluding Brazil, nearly tripled.[12] Brazil itself was the world's sixth largest investor in renewable energy as of 2012.[13] It produces almost all of the world's sugar-based ethanol and has been working to add more small hydroelectric, biomass, and wind power to its energy mix.[14] In fact, largely due to strong growth in its wind

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RENEWABLE ENERGY COUNTRY ATTRACTIVENESS INDICES 11 (2011); ERNST & YOUNG, ISSUE 27, RENEWABLE ENERGY COUNTRY ATTRACTIVENESS INDICES 11 (2010); ERNST & YOUNG, ISSUE 26, RENEWABLE ENERGY COUNTRY ATTRACTIVENESS INDICES 10 (2010). Moreover, previous to that Ernst & Young ranked the United States the number one most attractive country for renewable energy. ERNST & YOUNG, ISSUE 25, RENEWABLE ENERGY COUNTRY ATTRACTIVENESS INDICES 10 (2010); ERNST & YOUNG, ISSUE 24, RENEWABLE ENERGY COUNTRY ATTRACTIVENESS INDICES 9 (2010). The United States was once again given the number one spot in the May 2013 rankings. ERNST & YOUNG, ISSUE 37, RENEWABLE ENERGY COUNTRY ATTRACTIVENESS INDICES 16 (2013) [hereinafter ERNST & YOUNG MAY 2013]. The report attributes this rise largely to "[h]igh barriers to entry for external investors" in China (while also pointing out that the growth prospects for the sector in China remain strong). *Id.* at 5, 17. Given this explanation and the trend over the past few years, it remains to be seen whether the United States will retain the number one spot in future rankings.

[8] Stevens, *supra* note 6. As an example of high capital costs, as of 2011, a solar farm cost about $3.25 per watt whereas a gas-fired electric plant cost under $1.25 per watt. *Id.*

[9] *See* ERNST & YOUNG MAY 2011, *supra* note 7 (stating that "lack of liquidity in power offtake arrangements remain the major barrier" to wind projects in light of low gas prices in the United States); UNEP & BNEF 2011, *supra* note 4, at 16 (noting that for most of 2010, the benchmark rate for natural gas was between $3 and $5/MMBTu, compared with $13/MMBTu in 2008).

[10] *See* UNEP & BNEF 2011, *supra* note 4, at 6.

[11] *See id.* at 17–24 (describing various government actions).

[12] *See id.* at 23.

[13] KPMG INT'L, TAXES AND INCENTIVES FOR RENEWABLE ENERGY 13 (2012).

[14] KPMG INT'L, TAXES AND INCENTIVES FOR RENEWABLE ENERGY 3, 10 (2011).

market, Brazil broke into the top ten ranked countries in Ernst & Young's November 2011 Renewable Energy Country Attractiveness Indices.[15]

Around the world, countries such as Brazil, China, India, Spain, and the United Kingdom have been working to reap the benefits that renewable energy offers.[16] Diversification of a country's energy matrix to include more renewable energy can promote economic development, national security, and environmental sustainability.[17] The environmental ramifications seem to be clear. Conventional fossil fuels pollute the air and water, and they contribute to global warming.[18] Producing electricity using renewable resources can mitigate these negative environmental effects.[19] Avoiding such pollutants results in economic benefits such as lower health care costs.[20] Additional economic benefits derive from spending more locally to build and maintain the renewable energy facilities than on costly resource inputs from other countries

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[15] ERNST & YOUNG NOV. 2011, *supra* note 7, at 13–14. As of May 2009, Brazil was ranked number twenty. ERNST & YOUNG, ISSUE 21, RENEWABLE ENERGY COUNTRY ATTRACTIVENESS INDICES 10 (2009) [hereinafter ERNST & YOUNG MAY 2009]. Between November 2011, when Brazil first broke into the top ten, and February 2013, Brazil's spot in the ranking varied between number nine and number eleven. ERNST & YOUNG MAY 2012, *supra* note 7 (ranking Brazil at number nine); ERNST & YOUNG FEB. 2013, *supra* note 7 (ranking Brazil at number 11); *see also* ERNST & YOUNG, ISSUE 35, RENEWABLE ENERGY COUNTRY ATTRACTIVENESS INDICES 21 (2012) [hereinafter ERNST & YOUNG NOV. 2012] (ranking Brazil at number ten); ERNST & YOUNG AUG. 2012, *supra* note 7 (same); ERNST & YOUNG FEB. 2012, *supra* note 7 (same). Brazil's overall score increased from 44 to 50.5 over the same period. ERNST & YOUNG MAY 2009, *supra*; ERNST & YOUNG FEB. 2013, *supra* note 7. In comparison, the United States' score fell from 70 to 64.9. ERNST & YOUNG MAY 2009, *supra*; ERNST & YOUNG FEB. 2013, *supra* note 7. In the most recent May 2013 ranking, Brazil fell to number 15. *See* ERNST & YOUNG MAY 2013, *supra* note 7, at 16. The rankings attribute this fall to government proposals for domestic content rules and transmission requirements for wind projects that would likely increase project costs and intensify competition, as well as the recent cancellation of auctions. *Id.* at 5, 12. This fall in the rankings is clearly inconsistent with the trend of recent years. It remains to be seen whether this fall will be permanent. The May 2013 rankings also employed a new methodology to reflect a changed landscape for energy investment. *Id.* at 5. Under this new methodology, Brazil's score rose slightly to 50.7 while the United States' score increased to 71.6. *See id.* at 16. Even taking this new methodology into account, the total increase in Brazil's score from May 2009 to May 2013 (44 to 50.7) is greater than the total increase in the United States' score (70 to 71.6). Additionally, while Brazil fell in the May 2013 rankings, its total score did not decrease.

[16] *See* ERNST & YOUNG NOV. 2011, *supra* note 7, at 18–30 (discussing countries' efforts).

[17] *See, e.g.*, Michael B. Gerrard, *Introduction and Overview* to THE LAW OF CLEAN ENERGY: EFFICIENCY AND RENEWABLES 1, 18 (Michael B. Gerrard ed., 2011); *Clean Energy*, UNION CONCERNED SCIENTISTS, http://www.ucsusa.org/clean_energy/technology_and_impacts/impacts/public-benefits-of-renewable.html (last revised Apr. 8, 2013).

[18] *See, e.g.*, Gerrard, *supra* note 17, at 1; *Clean Energy*, *supra* note 17.

[19] *Clean Energy*, *supra* note 17.

[20] *See id.*; *cf.* Gerrard, *supra* note 17, at 1 (reporting that urban air pollution leads to nearly 800,000 deaths worldwide each year).

or states.[21] In addition, using renewable energy reduces the country's vulnerability to volatile fossil fuel prices, which may benefit ratepayers by stabilizing electricity rates.[22]

However, to achieve these beneficial results, special legal frameworks to encourage investment in renewable energy are necessary because the capital costs associated with renewable energy projects are higher than for conventional power plants.[23] The frameworks governments use vary greatly, but they generally attempt to compensate for high costs by subsidizing renewable energy, establishing special power-purchasing rules, and lowering transaction costs.[24] Currently, the United States encourages investment in renewable energy largely through subsidies in the form of short-term tax incentives and state renewable energy mandates.[25]

This Comment focuses on the current legal framework to encourage investment in electricity generation from renewable resources in the United States.[26] It is premised on the fact that the United States has already decided to promote renewable energy, as demonstrated by various measures it has adopted to do so. It considers those laws that have been most successful in encouraging investment in renewable energy in the United States.[27] Based on an analysis of the current U.S. legal framework and a study of Brazil's efforts to diversity its energy mix, which have contributed to its increasing recognition as a renewables powerhouse, this Comment argues most specifically that the

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[21] *See Benefits of Renewable Energy*, NEXTERA ENERGY RESOURCES, http://www.nexteraenergyresources.com/content/environment/benefits.shtml (last visited July 1, 2013). For example, Iowa and Massachusetts import about 97% of the energy they use. *Clean Energy*, *supra* note 17.

[22] *See Clean Energy*, *supra* note 17; *see also* ANNUAL ENERGY REVIEW 2011, *supra* note 1, at 215 tbl.7.9 (reporting coal prices between 1949 and 2010); *Price of U.S. Natural Gas Imports*, U.S. ENERGY INFO. ADMIN., www.eia.gov/dnav/ng/hist/n9100us3m.htm (last updated June 28, 2013) (depicting fluctuation in natural gas import prices between 2000 and 2012).

[23] *See* Fredric Beck & Eric Martinot, *Renewable Energy Policies and Barriers*, *in* 5 ENCYCLOPEDIA OF ENERGY 365, 366–67 (Cutler J. Cleveland ed., 2004). Furthermore, conventional sources of energy are subsidized, making it hard for renewable energy to compete if not put on equal footing. *See generally* U.S. ENERGY INFO. ADMIN., DIRECT FEDERAL FINANCIAL INTERVENTIONS AND SUBSIDIES IN ENERGY IN FISCAL YEAR 2010, at 1 (2011) (providing "a snapshot of direct federal financial interventions and subsidies in energy markets . . . focusing on subsidies to electricity production").

[24] *See* Beck & Martinot, *supra* note 23, at 370–76.

[25] *See infra* Part II.B–C.

[26] This Comment does not consider renewable energy in forms other than electricity and also does not consider alternative, but not renewable, forms of energy such as nuclear.

[27] It does not consider other roadblocks to developing renewable energy projects, such as siting and environmental licensing. *See generally* Patricia E. Salkin, *Facility Siting and Permitting*, *in* THE LAW OF CLEAN ENERGY, *supra* note 17, at 95, 95–114 (discussing siting and permitting of renewable energy projects). These are crucial elements of facilitating the development of renewable energy and deserve separate attention.

United States should modify the federal framework to increase access for power producers using renewable resources to long-term PPAs with electric utilities.

Part I of this Comment provides an overview of investment programs for renewable energy, as well as the hallmarks of an efficient renewable-energy legal framework. Part II then analyzes the existing legal framework to promote investment in renewable energy in the United States. It argues that the current framework creates unnecessary investment costs and does not provide the long-term predictability necessary to stimulate continuous investment. Part III focuses on Brazil's renewable energy model and Part IV draws lessons from Brazil's experience to apply in the United States. Finally, Part V recommends and concludes that the United States should show its commitment to renewable energy by adopting a national renewable portfolio standard (RPS) requiring electric utilities to purchase, on a competitive basis through long-term contracts with nonutility power producers, a specific percentage of the electricity that the utilities supply to their consumers, unless a utility can generate the required amount itself more cheaply.

## I. AN INTRODUCTION TO INVESTMENT IN RENEWABLE ENERGY

While renewable energy offers many advantages, various impediments inherent to its use stall the industry's growth. One challenge is that most of the costs of renewable energy projects are for "up-front capital."[28] Once in operation, fuel costs for projects such as a solar or wind farm are minimal.[29] Regardless, higher initial capital costs mean that a renewable energy project provides less installed capacity per dollar invested, and requires greater amounts of up-front financing, than a conventional power plant.[30]

Another barrier to using renewable energy is intermittency.[31] Most renewable resources are intermittent: "[t]he wind does not always blow and the sun does not always shine."[32] Additional roadblocks stem from the level of technological development and concerns about technical reliability of renewable energy equipment.[33]

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[28] *E.g.*, Gerrard, *supra* note 17, at 12.

[29] *See, e.g.*, *id.*

[30] Beck & Martinot, *supra* note 23, at 366.

[31] *E.g.*, Gerrard, *supra* note 17, at 11.

[32] *See id.*

[33] *See* Braden W. Penhoet, *Financing Structures and Transactions*, *in* THE LAW OF CLEAN ENERGY, *supra* note 17, at 241, 242.

The unique risks and high capital costs reduce the amount of affordable financing available to renewable energy projects and make an effective legal framework to stimulate investment that much more important.[34] Financing, the tools used to encourage investment in renewable energy, and the hallmarks of an effective renewable-energy legal framework are discussed below in Parts I.A to I.C, respectively.

### *A. Financing a Renewable Energy Project*

Facilities producing electrical energy from renewable resources may be constructed and operated by various types of entities, including nonutility power producers. An independent power producer (IPP), for example, is an independent generator of electricity that uses the transmission facilities of utilities to deliver power to customers.[35] It sells its power with authorization from the Federal Energy Regulatory Commission (FERC) and its service obligation is defined by the terms of its power sales contracts—usually a PPA with a utility or third party.[36] The PPA sets forth the obligations of the power producer and power purchaser, as well as the price the power producer will receive.[37]

Renewable energy projects often require equity and debt financing.[38] Power producers that do not have enough tax liabilities to take advantage of the large tax incentives available in the United States find tax equity investors who do.[39] A tax equity investor contributes capital in return for tax benefits equal to the capital contribution and a return on the investment.[40] Thus, potential returns from a renewable energy project must be predictable enough to entice investment.[41]

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[34] *See id.* at 241.

[35] *Electric Power Industry Overview 2007*, U.S. ENERGY INFO. ADMIN., www.eia.gov/cneaf/electricity/page/prim2/toc2.html (last visited July 1, 2013).

[36] *Id.*

[37] *E.g.*, Craig M. Kline, *Solar*, *in* THE LAW OF CLEAN ENERGY, *supra* note 17, at 391, 409.

[38] *See generally* Penhoet, *supra* note 33, at 242–57 (discussing various financing structures).

[39] *E.g.*, PAUL SCHWABE ET AL., NAT'L RENEWABLE ENERGY LAB., NREL/TP-6A2-44930, RENEWABLE ENERGY PROJECT FINANCING: IMPACTS OF THE FINANCIAL CRISIS AND FEDERAL LEGISLATION 2–3 (2009).

[40] *Id.* at 5.

[41] *Cf.* MICHAEL MENDELSOHN & JOHN HARPER, NAT'L RENEWABLE ENERGY LAB., NREL/TP-6A20-53720, § 1603 TREASURY GRANT EXPIRATION: INDUSTRY INSIGHT ON FINANCING AND MARKET IMPLICATIONS 18 (2012) ("As a general rule . . . tax equity investors are conservative in their tolerance for risk.").

One common way to use debt to finance a renewable energy project is called "project finance."[42] Project finance allows an entity to manage risk by isolating substantial project-related debts in a separate entity.[43] Under these structures, project revenues alone repay the loan.[44] As such, project lenders need high levels of confidence in the project's ability to generate reliable revenue over the course of the loan.[45]

Therefore, both creditors and equity investors require evidence of a project's ability to generate consistent and sufficient levels of revenue. Commitments from customers, such as in the form of a PPA, are often key to securing both debt and equity financing.[46]

### *B. Mechanisms Used to Encourage Investment in Renewable Energy*

Given the financing needs of renewable energy projects, governments around the world use legal frameworks to promote investment in renewable energy.[47] The frameworks differ to some extent but are largely variations on and combinations of a standard set of tools.[48]

As Part II discusses, the most significant tools in the United States are tax incentives and state RPSs. RPSs encourage investment in renewable energy by requiring utilities to source a percentage of the electricity they sell from renewable resources or purchase renewable energy credits (RECs) from other sources to meet the quota.[49] Tax incentives, on the other hand, attempt to drive investment in renewable energy by making its development more economically attractive to investors.[50]

Differently, feed-in tariffs (FITs) and auctions focus on ensuring that power producers using renewable resources ("renewable-energy power producers") will be able to sell the electricity they generate over a period of time at a

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[42] *E.g.*, Penhoet, *supra* note 33, at 255–56.

[43] *Id.* at 255.

[44] *See id.* at 256.

[45] *Id.*

[46] *E.g.*, *id.*

[47] *See, e.g.*, KPMG INT'L, *supra* note 13, at 6–49.

[48] *See, e.g.*, Gerrard, *supra* note 17, at 14–18; *see also* KPMG INT'L, *supra* note 13, at 1.

[49] *E.g.*, Joshua P. Fershee, *Renewables Mandates and Goals*, *in* THE LAW OF CLEAN ENERGY, *supra* note 17, at 77, 77; *see also infra* Part II.C.

[50] *See, e.g.*, KPMG INT'L, *supra* note 13, at 1; *infra* Part II.B.

certain price.[51] The tools differ in that FITs generally require utilities to buy electricity from renewable energy projects at a government-mandated price above the market rate, whereas under an auction system renewable-energy power producers bid for contracts and only those bidders offering the lowest price actually secure a contract.[52] These tools are discussed in Part III since Brazil has experience with both.

### *C. The Hallmarks of an Effective Renewable Energy Investment Framework*

Generally, a legal framework that fosters long-term investment is one that investors perceive as stable and predictable.[53] The framework also must not unnecessarily increase the costs or risks of doing business.[54]

In accordance with these general investment principles, to effectively promote investment in renewable energy, a government's legal framework must be simple, consistent, and predictable.[55] It must set the stage for investors to earn a high enough return to compensate for any uncertainties so that the renewable energy project can secure financing.[56] The framework can do so in part by eliminating unnecessary costs.[57] A long-term guarantee to purchase

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[51] *See* Toby Couture, *Feed-in Tariffs or Bidding: How Best to Assign Renewable Contracts*, WIND-WORKS.ORG (Mar. 9, 2011), http://www.wind-works.org/cms/index.php?id=39&tx_ttnews%5Btt_news%5D=1225&cHash=0cab70c9655f6cff7f295123e2e136e4 (comparing FITs and auctions and noting that successful bidders in auctions are awarded contracts).

[52] *Id.*; *see also infra* Part III.A–B. As noted, legal frameworks often utilize a combination of these tools. For example, the California Public Utilities Commission authorized a renewable auction mechanism to procure renewable energy from small projects eligible for the California RPS Program. Decision Adopting the Renewable Auction Mechanism, Decision 10-12-048, Rulemaking 08-08-009, at 2 (Cal. Pub. Utils. Comm'n Dec. 17, 2010). The purpose was, among others, to promote competition and secure low costs for ratepayers, and to contribute to short-term RPS goals. *Id.*

[53] United Nations Conference on Trade and Development, *The Role of International Investment Agreements in Attracting Foreign Direct Investment to Developing Countries*, 15, U.N. Doc. UNCTAD/DIAE/IA/2009/5 (2009) [hereinafter UNCTAD]; *see also* Treaty Concerning the Encouragement and Reciprocal Protection of Investment, U.S.-Uru., Nov. 4, 2005, T.I.A.S. No. 06-1101 ("*Agreeing* that a stable framework for investment will maximize effective utilization of economic resources and improve living standards").

[54] *See* UNCTAD, *supra* note 53, at 40.

[55] *E.g.*, TOBY D. COUTURE ET AL., NAT'L RENEWABLE ENERGY LAB., NREL/TP-6A2-44849, A POLICYMAKER'S GUIDE TO FEED-IN TARIFF POLICY DESIGN 11 (2010); Randall Swisher & Kevin Porter, *Renewable Policy Lessons from the US: The Need for Consistent and Stable Policies*, *in* RENEWABLE ENERGY POLICY AND POLITICS: A HANDBOOK FOR DECISION-MAKING 185, 185 (Karl Mallon ed., 2006).

[56] *E.g.*, DIMITRIS N. CHORAFAS, ENERGY, ENVIRONMENT, NATURAL RESOURCES AND BUSINESS COMPETITIVENESS: THE FRAGILITY OF INTERDEPENDENCE 90 (2011).

[57] *See* Felix Mormann, *Enhancing the Investor Appeal of Renewable Energy*, 42 ENVTL. L. 681, 711, 713–14 (2012); *cf.* UNCTAD, *supra* note 53, at 40 (noting a study in which the authors hypothesized that

electricity generated by the project can help by increasing investment security.[58] The long-term contract can mitigate risk by immunizing investors against future changes that would affect revenue generation.[59]

The following Part demonstrates that the United States, through its reliance on tax incentives and state RPSs, fails to provide the simple, long-term, and predictable framework developers need to secure the lowest cost financing possible.[60]

## II. THE LEGAL FRAMEWORK FOR RENEWABLE ENERGY INVESTMENT IN THE UNITED STATES

There are numerous federal laws encouraging the use and development of renewable energy in the United States.[61] Yet a few of these laws impact investment in renewable energy projects more significantly than the rest.[62] While these laws have led to investment in renewable energy, they have failed to create a stable and predictable investment environment in which investment occurs continuously.[63] To complement the federal framework, states have enacted their own renewable energy laws.[64] These laws have increased

having more host-country bilateral investment treaties reduced costs associated with long-term capital investment in the host country, which led, in turn, to increased foreign direct investment).

58 Karsten Neuhoff, *Large-Scale Deployment of Renewables for Electricity Generation*, *in* THE NEW ENERGY PARADIGM 288, 314 (Dieter Helm ed., 2007); *see also* Decision Adopting the Renewable Auction Mechanism, Decision 10-12-048, Rulemaking 08-08-009, at 14 (Cal. Pub. Utils. Comm'n Dec. 17, 2010) (listing the goals of (1) lowering transaction costs and (2) executing contracts for financeable prices when setting the auction prices mechanism).

59 Neuhoff, *supra* note 58, at 314.

60 *See* Ronald H. Rosenberg, *Harmonious Federalism in Support of National Energy Goals—Increased Wind Renewable Energy*, 85 N.D. L. REV. 781, 793–94, 805–06 (2009) (noting that there is no long-term federal strategy to promote wind energy).

61 *See, e.g.*, 7 U.S.C. § 902(a) (2012) (allowing the Secretary of Agriculture to make loans for renewable energy systems under a rural electrification program); 10 U.S.C. § 2922b (2012) (requiring the secretary of a military department to procure systems that use renewable energy whenever possible and practical); 42 U.S.C. § 15852 (2006) (mandating that at least 7.5% of electrical energy the federal government consumes must be renewable by the 2013 fiscal year).

62 *See, e.g.*, DIPA SHARIF ET AL., BLOOMBERG NEW ENERGY FIN., THE RETURN—AND RETURNS—OF TAX EQUITY FOR US RENEWABLE PROJECTS 1 (2011); RYAN WISER ET AL., LAWRENCE BERKELEY NAT'L LAB., LBNL-63583, USING THE FEDERAL PRODUCTION TAX CREDIT TO BUILD A DURABLE MARKET FOR WIND POWER IN THE UNITED STATES 1 (2007).

63 *E.g.*, Swisher & Porter, *supra* note 55; Stevens, *supra* note 6.

64 *See infra* Part II.C.

renewable energy generation but have also resulted in a patchwork that makes compliance complex and costly.[65]

Overall, the current U.S. legal framework does not provide the long-term stability developers of renewable energy projects need to secure low-cost financing (or often any financing at all). This Part demonstrates the need to overhaul the current framework to ensure a stable environment in which renewable-energy power producers have access to long-term PPAs.[66] Section A addresses the Public Utility Regulatory Policy Act (PURPA). PURPA initially spurred investment but has failed to do so recently,[67] causing greater reliance on federal tax incentives.[68] Those tax incentives are explored in section B. Last, section C considers some of the mechanisms states have adopted to promote renewable energy development.

### *A. PURPA: An Antiquated Approach to Encouraging Renewable Energy Investment*

PURPA stimulated investment in renewable energy by creating a market for small power producers.[69] It was enacted in 1978 in response to "skyrocketing prices for energy, high inflation, economic stagnation, and dependence on [foreign oil]."[70] Among Congress's findings when enacting the legislation were the following:

> [T]he protection of the public health, safety, and welfare, the preservation of national security, and the proper exercise of congressional authority under the Constitution to regulate interstate commerce require[d]—

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[65] Mormann, *supra* note 57, at 725–26; Benjamin K. Sovacool & Christopher Cooper, *Congress Got It Wrong: The Case for a National Renewable Portfolio Standard and Implications for Policy*, 3 ENVTL. & ENERGY L. & POL'Y J. 85, 88 (2008).

[66] *See* Neuhoff, *supra* note 58, at 314; Stevens, *supra* note 6.

[67] *See* Eric Martinot et al., *Renewable Energy Policies and Markets in the United States*, CENTER FOR RESOURCE SOLUTIONS, http://www.resource-solutions.org/lib/librarypdfs/IntPolicy-RE.policies.markets.US.pdf (last visited June 15, 2013) (noting that "PURPA's influence faded in the 1990s"); *Public Utility Regulatory Policy Act (PURPA)*, UNION CONCERNED SCIENTISTS, http://www.ucsusa.org/clean_energy/solutions/big_picture_solutions/public-utility-regulatory.html (last visited July 1, 2013).

[68] *Cf.* SHARIF ET AL., *supra* note 62 ("Tax credits are likely to again become the most important subsidies supporting renewable project development in the [United States] . . . .").

[69] *E.g.*, Richard F. Hirsh, *PURPA: The Spur to Competition and Utility Restructuring*, ELECTRICITY J., Aug.–Sept. 1999, at 60, 63–64; Or. Dep't of Energy, *Federal Public Utility Regulatory Policy Act of 1978 (PURPA): Update March 2006*, OREGON.GOV (Mar. 2006), http://www.oregon.gov/energy/RENEW/docs/PURPA_update_March06.pdf; *Public Utility Regulatory Policy Act (PURPA)*, *supra* note 67.

[70] Hirsh, *supra* note 69, at 61–62.

> (1) a program providing for increased conservation of electric energy, increased efficiency in the use of facilities and resources by electric utilities, and equitable retail rates for electric consumers,
>
> (2) a program to improve the wholesale distribution of electric energy [and] the reliability of electric service . . .
>
> . . . .
>
> (4) a program for the conservation of natural gas while insuring that rates to natural gas consumers are equitable . . . .[71]

As part of its efforts to achieve these goals, Congress created a class of qualifying facilities (QFs), including cogenerators[72] and small power producers using renewable resources, which would receive special rate treatment.[73]

PURPA directed FERC[74] to prescribe rules *requiring* electric utilities to offer to purchase electricity from QFs.[75] It specified that the purchase rates paid to QFs "be just and reasonable to the electric consumers of the electric utility and in the public interest" and "not discriminate against" the QFs.[76] However, no rule could *require* a utility to pay a rate that "exceeds the incremental cost to the electric utility of alternative electric energy."[77]

As implemented, QFs can sell to a utility at the utility's avoided cost or at another negotiated rate.[78] The utility's "[a]voided cost is the incremental cost to [the] electric utility of electric energy or capacity which, but for the purchase from the QF, such utility would generate itself or purchase from

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[71] Public Utility Regulatory Policy Act of 1978 (PURPA), Pub. L. No. 95-617, § 2, 92 Stat. 3117, 3119 (codified at 16 U.S.C. § 2601 (2006)).

[72] A cogeneration facility produces electric energy and steam or other forms of useful energy for "industrial, commercial, heating, or cooling purposes." 16 U.S.C. § 796(18)(A).

[73] PURPA § 210, 92 Stat. at 3144–47 (codified as amended at 16 U.S.C. § 824a-3); *What is a Qualifying Facility?*, FED. ENERGY REG. COMMISSION, http://www.ferc.gov/industries/electric/gen-info/qual-fac/what-is.asp (last updated Feb. 3, 2012).

[74] FERC has jurisdiction over wholesale power transactions and prices. 16 U.S.C. § 824(b)(1); 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, 180 (2010).

[75] PURPA § 210(a), 92 Stat. at 3144 (codified as amended at 16 U.S.C. § 824a-3(a)). The Energy Policy Act of 2005 repealed the mandatory purchase requirement for areas with independent transmission operators and viable spot markets. Pub. L. No. 109-58, sec. 1253(a), § 210(m)(1), 119 Stat. 594, 967–68 (codified at 16 U.S.C. § 824a-3(m)(1)); Or. Dep't of Energy, *supra* note 69.

[76] PURPA § 210(b), 92 Stat. at 3144 (codified at 16 U.S.C. § 824a-3(b)).

[77] *Id.* The incremental cost is "the cost to the electric utility of the electric energy which, but for the purchase from such cogenerator or small power producer, such utility would generate or purchase from another source." PURPA § 210(d), 92 Stat. at 3145 (codified at 16 U.S.C. § 824a-3(d)).

[78] *What Are the Benefits of QF Status?*, FED. ENERGY REG. COMMISSION, http://www.ferc.gov/industries/electric/gen-info/qual-fac/benefits.asp (last updated Feb. 3, 2012).

another source."[79] At the same time, FERC's rules allowed each state to develop its own method to calculate avoided cost[80] and determine whether to require long-term contracts.[81] Not requiring long-term contracts is problematic because nonutility power producers need long-term contracts to attract affordable financing.[82]

Although PURPA initially stimulated investment in renewable energy, its structure is wrought with problems and it is no longer as effective.[83] The first problem is that wide state discretion resulted in a patchwork of implementation methodologies.[84] California, for example, established a generous regime assuring QFs a fixed rate over a ten-year period.[85] The rates granted reflected the belief that oil costs (and avoided costs) would escalate.[86] When oil prices fell, the utilities had to continue paying QFs the high rate contracted for even though their avoided costs had fallen with oil and gas prices.[87] In other states, utilities had broad authority to determine the inputs on which avoided cost calculations were based.[88] This discretion "create[d] inconsistency and put[] . . . downward pressure on avoided cost rates."[89] Yet another set of states implemented bidding schemes under which QFs bid for a certain amount of capacity.[90]

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79 *Id.*

80 CAROLYN ELEFANT, REVIVING PURPA'S PURPOSE: THE LIMITS OF EXISTING STATE AVOIDED COST RATEMAKING METHODOLOGIES IN SUPPORTING ALTERNATIVE ENERGY DEVELOPMENT AND A PROPOSED PATH FOR REFORM 10–36 (2011), *available at* http://lawofficesofcarolynelefant.com/wp-content/uploads/2012/11/Elefant_Reviving_PURPA_Avoided_Costs_2011-dated.pdf (discussing state methodologies); Swisher & Porter, *supra* note 55, at 186–88 (same); *see also* 18 C.F.R. § 292.304(e) (2012) (establishing factors that must be considered "to the extent practicable" when determining avoided costs).

81 *See* 18 C.F.R. § 292.304(d) (stating that each QF "shall have the option either" of providing energy as available or under a contract for a "specified term").

82 ELEFANT, *supra* note 80, at 3; *see also* COUTURE ET AL., *supra* note 55, at viii–ix ("Longer contract periods help lower levelized payments, ensure cost recovery, lower the cost of financing, and increase investor confidence."); Stevens, *supra* note 6.

83 *Public Utility Regulatory Policy Act (PURPA)*, *supra* note 67; *see also* Fershee, *supra* note 49, at 77 (stating that PURPA's role has largely been supplanted by state RPSs).

84 *See* ELEFANT, *supra* note 80.

85 *E.g.*, Martinot et al., *supra* note 67. The contract was for fifteen to thirty years, but the price was fixed for ten. *Id.*

86 Hirsh, *supra* note 69, at 63.

87 *See id.*

88 ELEFANT, *supra* note 80, at 2–3.

89 *Id.*

90 Hirsh, *supra* note 69, at 66. State regulators and FERC appeared to view auctions as "compatible with the spirit and letter of PURPA." *Id.*

With respect to contracts, many jurisdictions did not require long-term contracts.[91] Idaho, for example, originally required twenty-year contracts, but later modified that to five-year contracts due to unwillingness to commit to high prices.[92] Evidently, FERC's guidelines did not result in uniform practices. One commentator noted that avoided-cost ratemaking has confounded developers and regulators alike due to its "Byzantine nature . . . at the state level."[93] Thus, wide state discretion created a complex system that does not provide investors the predictability they need to make long-term investment decisions.

The other major problem with PURPA is its setting avoided cost as the highest price that a utility could be *required* to pay a QF. When oil and gas prices are high, avoided cost rates may be sufficient to promote investment in renewable energy.[94] In recent years, however, the price of oil has declined and natural gas supplies have increased, greatly lowering the avoided cost for utilities.[95] Avoided cost calculations generally do not consider extrinsic costs such as environmental degradation.[96] Were these extrinsic costs included, the avoided cost would increase, making renewable energy more competitive.[97] In most states, however, such a low cap does not assure investors of adequate return on their investment.[98] Although utilities could agree to a higher rate, it is tough to convince a utility to pay a higher price unless otherwise required.[99]

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[91] ELEFANT, *supra* note 80, at 33–36.

[92] *See* Martinot et al., *supra* note 67. The optimal contract length for renewable energy projects is, on average, at least twenty years. *See infra* Part IV.A.

[93] ELEFANT, *supra* note 80, at 2.

[94] *See* Martinot et al., *supra* note 67.

[95] *Public Utility Regulatory Policy Act (PURPA)*, *supra* note 67; *see also* Beck & Martinot, *supra* note 23, at 371 (stating that by the 1990s, energy prices had not risen as expected and new natural-gas-fired generation came on-line, causing renewable energy to be less competitive).

[96] *See* Ferrey et al., *supra* note 74, at 142.

[97] *Public Utility Regulatory Policy Act (PURPA)*, *supra* note 67.

[98] COUTURE ET AL., *supra* note 55, at 17. PURPA is sometimes considered the original FIT policy. *Id.* at 9; Martinot et al., *supra* note 67. FITs are the most widely used policy in the world to accelerate renewable energy deployment. *E.g.*, COUTURE ET AL., *supra* note 55, at 1. Typical FITs reduce risk of investment in renewable energy by guaranteeing access to the electric grid, providing stable long-term PPAs, and setting payment levels based on the cost of renewable energy generation. *Id.* at vi. Thus, PURPA does not share the characteristics of most effective FITs.

[99] *Cf.* Ferrey et al., *supra* note 74, at 201 (noting that a utility that voluntarily agrees to a rate above avoided cost may be faced with a legal challenge as "'imprudent'"); Erin Dewey, Note, *Sundown and You Better Take Care: Why Sunset Provisions Harm the Renewable Energy Industry and Violate Tax Principles*, 52 B.C. L. REV. 1105, 1113 (2011) (arguing that utilities will not enter long-term contracts for renewable energy when the short-term price for traditional energy is lower).

### *B. Tax Incentives: Creating a Boom-and-Bust Investment Cycle*

Along with PURPA, the federal government began adopting tax incentives to encourage investment in renewable energy projects. The primary tax incentives include the Business Energy Investment Tax Credit (ITC)[100] and the Renewable Electricity Production Tax Credit (PTC).[101] These credits have been in place for several years[102] and have been renewed and modified multiple times.[103] At times they have been complemented by additional tax incentives or non-tax incentive schemes.[104] Reliance on an "on-again, off-again" tax system creates an unstable investment environment in which entities hesitate to make long-term investment decisions leading up to the credit's expiration, resulting in a boom-and-bust cycle.[105]

The PTC provides a tax credit based on the amount of electricity produced from renewable energy projects and sold by the taxpayer during a ten-year period.[106] The PTC expires in different years depending on the technology used.[107] It is generally renewed for only a couple of years and, on three occasions, was allowed to expire first, leaving a gap in coverage.[108]

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[100] I.R.C. § 48 (Supp. III 2010); *see also Business Energy Investment Tax Credit (ITC)*, DSIRE, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US02F (last updated Jan. 3, 2013) [hereinafter *DSIRE ITC*].

[101] I.R.C. § 38(b)(8) (2006); *id.* § 45 (2006 & Supp. IV 2011); *see also Renewable Electricity Production Tax Credit (PTC)*, DSIRE, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US13F&re=1&ee=1 (last updated Apr. 16, 2013) [hereinafter *DSIRE PTC*]. There are various other tax incentives for renewable energy. One important one is accelerated depreciation under the Modified Accelerated Cost Recovery System, which benefits investors by allowing them to deduct a larger depreciation expense early on leading to a lower taxable income. MINTZ LEVIN COHN FERRIS GLOVSKY & POPEO PC, RENEWABLE ENERGY PROJECT FINANCE IN THE U.S.: AN OVERVIEW AND MIDTERM OUTLOOK 10 (2010) [hereinafter MINTZ LEVIN], *available at* http://www.greentechmedia.com/images/wysiwyg/reports/MintzLevin-WP-Web-Final-1(2).pdf. Another tax credit, the Qualified Advanced Energy Project Credit, was adopted in 2009 and provides a 30% credit for any project that re-equips, expands, or establishes a facility to manufacture property that produces renewable energy. I.R.C. § 48C (Supp. III 2010).

[102] The PTC is the newer of the two credits and has been in place since 1992. *See DSIRE PTC*, *supra* note 101 (discussing the recent changes to the credit).

[103] *E.g.*, *id.*; *DSIRE ITC*, *supra* note 100 (discussing the credit's history).

[104] *See generally* SHARIF ET AL., *supra* note 62, at 1–5; Roberta F. Mann & E. Margaret Rowe, *Taxation*, *in* THE LAW OF CLEAN ENERGY, *supra* note 17, at 145 (discussing renewable energy tax policy); *supra* text accompanying note 101.

[105] Dewey, *supra* note 99, at 1127 (internal quotation marks omitted); *accord* ERNST & YOUNG MAY 2012, *supra* note 7, at 25; Swisher & Porter, *supra* note 55, at 188–89.

[106] I.R.C. § 45. The PTC is indexed to inflation and is currently $.02/kilowatt hour (kWh) or $.01/kWh, depending on the technology used. *DSIRE PTC*, *supra* note 101.

[107] *See* I.R.C. § 45.

[108] *E.g.*, *DSIRE PTC*, *supra* note 101. For example, the PTC expired at the end of 2003 and was not renewed until October 2004. *Id.*

Different from the PTC, which is based on actual energy production, the ITC allows businesses to receive a one-time federal income tax credit of 30% of the amount invested in a renewable energy project.[109] Generally, a qualified project must be placed in service before 2017.[110] Congress expanded the ITC under the American Recovery and Reinvestment Act (ARRA) of 2009 in response to the economic downturn.[111] The ARRA changes were significant because they allowed taxpayers eligible for a PTC to elect the ITC instead.[112] Thus, some facilities otherwise not qualified for an ITC may currently take it if it is more advantageous.[113]

Tax incentives such as the ITC and PTC are often referred to as tax expenditures[114] and are commonly used to induce certain behaviors.[115] Although they do stimulate investment, academics have questioned the efficacy of their use.[116] One problem is that they distort market prices and behavior because they encourage investments based on the tax savings generated rather than on the activity's economic merit.[117] Another problem is that they are difficult to target effectively—they generally apply to all business activity of a particular type.[118] In many cases, a tax incentive may be necessary to encourage one player to act but not another.[119]

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[109] I.R.C. § 48 (2006 & Supp. IV 2011). For certain technologies it is only 10% and for some it is capped. *Id.*; *DSIRE ITC*, *supra* note 100.

[110] I.R.C. § 48; *DSIRE ITC*, *supra* note 100.

[111] American Recovery and Reinvestment Act of 2009 (ARRA), Pub. L. No. 111-5, secs. 1102–1104, § 48, 123 Stat. 115, 319–21; *see also DSIRE ITC*, *supra* note 100 (explaining ARRA's changes to the ITC).

[112] ARRA sec. 1102, 123 Stat. at 319. A taxpayer may only use one of the tax credits. *See* I.R.C. § 48(a)(5)(B).

[113] I.R.C. § 48(a)(5). Additionally, certain technologies originally eligible only for the 10% ITC are now eligible for a 30% ITC. *See id.*

[114] The concept was introduced by Professor Stanley Surrey. Miles Mogulescu, Note, *The Tax Reform Act of 1976 and Tax Incentives for Motion Picture Investment: Throwing Out the Baby with the Bath Water*, 58 S. CAL. L. REV. 839, 842 n.22 (1985). Professor Surrey compared tax expenditures to direct expenditures and argued that if the government decides to assist a particular activity, it should do so with a direct expenditure unless there is a "clear and compelling" advantage to using a tax incentive. Stanley S. Surrey, *Tax Incentives as a Device for Implementing Government Policy: A Comparison with Direct Government Expenditures*, 83 HARV. L. REV. 705, 734 (1970).

[115] Edward D. Kleinbard, *The Congress Within the Congress: How Tax Expenditures Distort Our Budget and Our Political Processes*, 36 OHIO N.U. L. REV. 1, 3 (2010).

[116] *E.g.*, *id.* at 8–10; Surrey, *supra* note 114, at 726.

[117] Kleinbard, *supra* note 115, at 8; Mogulescu, *supra* note 114, at 842.

[118] Kleinbard, *supra* note 115, at 20.

[119] *Id.*

Additionally, tax incentives are inequitable because not all players benefit equally.[120] Tax incentives are most valuable to those taxpayers with high taxable incomes.[121] For example, a start-up that does not yet have any profits is unable to take advantage of an income tax credit like a Fortune 500 company that regularly turns a large profit can.[122]

These criticisms of tax incentives apply in the renewable energy context. Power producers that do not have tax liability can use the tax credits by securing equity investment from taxpayers who do.[123] Nevertheless, while a portion of the tax benefits is passed on to the power producer, it comes at the cost of legal fees to make the contractual arrangements and the return on investment required by the equity investors.[124] For small projects these additional costs could be prohibitive.[125] Thus, reliance on the ITC and PTC creates inequity and breaks one of the hallmarks of an effective investment framework by creating unnecessary costs.[126] It also distorts the market for renewable energy by allowing renewable-energy power producers to sell electricity at a cost that does not reflect the true price.[127]

Equally as important, reliance on the ITC and PTC to promote investment in renewable energy is problematic because it does not provide long-term predictability. As evidence, Congress's short-term approach has led to large investments in renewable energy during the years investors are certain their projects will qualify for a tax credit and much less investment in other years.[128] Consider investment in wind energy. The PTC expired at the end of 2003.[129] Almost four times as much wind energy capacity was installed in 2003 as in

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120 Surrey, *supra* note 114, at 720.

121 *Id.*

122 *Cf. id.* at 721 (comparing the effects of five-year amortization on a taxpayer in the 70% bracket with the effect on a taxpayer in the 20% bracket).

123 *E.g.*, SHARIF ET AL., *supra* note 62, at 3, 24. *See generally* Mann & Rowe, *supra* note 104, at 145–47 (discussing various tax equity structures).

124 *See* Penhoet, *supra* note 33, at 256 ("Enabling high-cost . . . project finance requires a complex series of agreements and ancillary documents . . . ."); *see also* SHARIF ET AL., *supra* note 62, at 1.

125 *See* Mormann, *supra* note 57, at 713–14; *see also* SHARIF ET AL., *supra* note 62, at 24.

126 *See* Swisher & Porter, *supra* note 55, at 189 (noting that inefficiencies of the PTC add substantial costs to development).

127 *See* Drew Thornley, *Texas Wind Energy: Past, Present, and Future*, 4 ENVTL. & ENERGY L. & POL'Y J. 69, 98–100 (2009); *cf.* Kleinbard, *supra* note 115, at 8 ("Many tax expenditures, particularly those that are designed as business incentives, thus distort market prices . . . ."); Mann & Rowe, *supra* note 104, at 161 ("Tax incentives reduce the relative price of renewable energy . . . ."); Martinot et al., *supra* note 67.

128 *E.g.*, SHARIF ET AL., *supra* note 62, at 1; Swisher & Porter, *supra* note 55, at 188–89.

129 *E.g.*, Swisher & Porter, *supra* note 55, at 188.

2004—1,766 megawatts (MW) versus 467 MW.[130] The credit was renewed in October 2004 and 2,017 MW of wind energy capacity were installed in 2005.[131]

The wind PTC was again set to expire at the end of 2012.[132] Even though Congress has renewed the credit repeatedly, there is always a risk that Congress may not renew it,[133] especially in the recent political climate with a Congress fixated on reducing the deficit.[134] Ultimately, the PTC was extended under the American Taxpayer Relief Act of 2012 (H.R. 8)—the bill passed on January 1, 2013 to avert the "fiscal cliff."[135] Once again, however, the extension is short term—just one year[136]—and did not occur in time to avoid a negative impact on the wind industry.[137] It has been reported that uncertainty over the past year regarding the extension has "halted development of new wind projects" and "layoffs had already begun" due to lack of demand.[138]

The start-and-stop approach to investment prohibits more robust development of renewables for three primary reasons. First, investors hesitate to make long-term commitments when the future of the tax credit is uncertain.[139] This applies to both renewable energy projects and any related

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130 SHARIF ET AL., *supra* note 62, at 4; *accord* Swisher & Porter, *supra* note 55, at 188 (reporting that 1,687 MW of wind were installed in 2003 and only 389 MW in 2004).

131 SHARIF ET AL., *supra* note 62, at 4. For more information on the effect of PTC expiration on wind energy development, see *Wind Energy Tax Credit Set to Expire at the End of 2012*, U.S. ENERGY INFO. ADMIN. (Nov. 21, 2012), http://www.eia.gov/todayinenergy/detail.cfm?id=8870, which depicts it graphically from the PTC's enactment in 1992 through 2012.

132 I.R.C. § 45(d)(1) (Supp. IV 2011).

133 Mormann, *supra* note 57, at 712; *see also* Dewey, *supra* note 99, at 1122 (noting the difference between Congress's acting to repeal a statute and letting a statute expire).

134 *See, e.g.*, Paul Krugman, Op-Ed, *Dwindling Deficit Disorder*, N.Y. TIMES, Mar. 11, 2013, at A21.

135 *Wind PTC Extension Approved as Lawmakers Strike Fiscal Cliff Package Deal*, POWER (Jan. 3, 2013), http://www.powermag.com/news/5284.html.

136 American Taxpayer Relief Act of 2012, Pub. L. No. 112-240, sec. 407(a), § 45, 126 Stat. 2313, 2340–41 (2013). The bill did provide some additional relief for most technologies, including wind, however by merely requiring construction to begin by the expiration of the statute rather than for the project to be placed in service by the expiration of the statute as previously required. I.R.C. § 45(d); American Taxpayer Relief Act sec. 407(a).

137 *Wind PTC Extension Approved as Lawmakers Strike Fiscal Cliff Package Deal*, *supra* note 135.

138 *Id.*

139 *See* Mona Hymel, *The United States' Experience with Energy-Based Tax Incentives: The Evidence Supporting Tax Incentives for Renewable Energy*, 38 LOY. U. CHI. L.J. 43, 68 (2006) (arguing that tax incentives should be left in place for at least ten years to be most effective); *Wind PTC Extension Approved as Lawmakers Strike Fiscal Cliff Package Deal*, *supra* note 135 (citing the American Wind Energy Association in saying that uncertainty over continuation of the PTC halted development of new wind projects in the United States).

manufacturing industry.[140] So the country misses out not only on investment in more renewable energy projects, but also on the economic benefits that a stable renewable-energy manufacturing industry could provide.[141]

Second, the short-term nature of tax credits makes projects more costly.[142] Because of the risk that the tax scheme may be modified before a project becomes eligible, investors may require higher payments to ensure the projects at least break even.[143] Also, competition for materials increases as developers seek to install new capacity at the same time (before the tax credit expires), driving up prices.[144]

Lastly, reliance on tax incentives fails to generate stable financing for renewable energy because fewer entities can use tax credits during economic downturns. For example, the economic decline of 2008 eliminated the demand for tax credits.[145] Tax credits only stimulate investment if enough entities have tax liability to use them.[146] The federal government recognized this problem and, in response, adopted cash grant[147] and accelerated loan guarantee schemes.[148]

Under ARRA's Section 1603 cash grant program, developers of renewable energy projects could receive a cash grant equivalent to 30% of the capital

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[140] Karl Mallon, *Myths, Pitfalls and Oversights*, *in* RENEWABLE ENERGY POLICY AND POLITICS, *supra* note 55, at 5, 24–25 (explaining that policy schemes that create a "boom–bust cycle" or "sunset" problem are inefficient for both the manufacturing and renewable energy industries).

[141] *See id.* (noting that a boom–bust cycle is the antithesis of what is necessary to establish manufacturing); *cf. Wind PTC Extension Approved as Lawmakers Strike Fiscal Cliff Package Deal*, *supra* note 135 (noting layoffs in the wind energy manufacturing sector).

[142] *See* WISER ET AL., *supra* note 62, at 5 ("[T]here is reason to believe that this increase in the cost of wind power has been exacerbated by the erratic boom-and-bust cycle created by the 1- to 2-year PTC extensions in recent years.").

[143] *E.g.*, Neuhoff, *supra* note 58, at 315.

[144] Dewey, *supra* note 99, at 1128; Chris Gadomski, *Challenges Ahead for the US Wind Industry*, MODERNPOWERSYSTEMS (Aug. 1, 2005), http://www.modernpowersystems.com/features/featurechallenges-ahead-for-the-us-wind-industry (reporting information provided by the American Wind Energy Association); *cf.* Sovacool & Cooper, *supra* note 65, at 96 (noting that new state RPS mandates drive up prices by creating "unexpected surges in demand"). *But see* WISER ET AL., *supra* note 62, at 10 (reporting that survey respondents did not expect the length of PTC extensions to affect raw material costs).

[145] SHARIF ET AL., *supra* note 62, at 4; *see also Wind Energy Tax Credit Set to Expire at the End of 2012*, *supra* note 131 ("The break in this growth streak occurred in 2010, as an echo effect of the financial crisis and recession from late 2008 and 2009. While wind projects were still eligible for tax credits, a lack of investors with sufficient tax appetite, or tax-situation ability to take advantage of the credits . . . contributed to slower growth for wind capacity in 2010.").

[146] SHARIF ET AL., *supra* note 62, at 4.

[147] *Id.*; Mann & Rowe, *supra* note 104, at 147.

[148] Kassia Yanosek, *Policies for Financing the Energy Transition*, DÆDALUS, Spring 2012, at 94, 99–100.

costs of the project instead of taking a tax credit.[149] However, this provision had only a short-lived effect. Project construction had to commence by 2011[150] and the scheme has since expired.[151] ARRA also established the Section 1705 temporary loan guarantee program to promote rapid deployment of renewable energy projects using commercial technologies.[152] It authorized loan guarantees for facilities that commenced construction prior to October 1, 2011.[153] This program has also not been renewed.[154]

Congress's adoption of the cash grant and loan guarantee programs is evidence that tax incentives do not create a stable investment environment. Nevertheless, the programs have fallen victim to the whims of Congress in large part due to concerns about their cost.[155]

### *C. State Mechanisms Promoting Investment in Renewable Energy*

To supplement federal legislation, state legislatures and regulatory bodies have adopted numerous measures to encourage investment in renewable energy.[156] For example, as of 2011, most states had at least one state or local tax incentive targeting renewable energy.[157] By way of an example of a non-tax incentive, several states have joined regional gas emission reduction initiatives, which allow states to compete to reduce greenhouse gas (GHG)

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149 ARRA, Pub. L. No. 111-5, § 1603, 123 Stat. 115, 364–66 (2009). Like with the ITC, the cap is 10% for certain technologies. *Id.*

150 Originally, the grant was only available to projects that began construction before 2011, but the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 extended the program for one year. Pub. L. No. 111-312, sec. 707, § 1603, 124 Stat. 3296, 3312.

151 *Id.*

152 ARRA sec. 406; MINTZ LEVIN, *supra* note 101, at 10. Section 1705's Federal Loan Guarantee Program was adopted in 2005 to promote the development of clean energy projects using innovative technology; in 2009, Congress expanded its scope to include commercial-ready renewable energy projects. John A. Herrick, *Government Nontax Incentives for Clean Energy*, *in* THE LAW OF CLEAN ENERGY, *supra* note 17, at 169, 189; Yanosek, *supra* note 148. It helps companies obtain affordable financing by guaranteeing loans for up to 80% of a project's capital costs if the project avoids, reduces, or sequesters air pollutants or greenhouse gas (GHG) emissions, or if it employs an innovative technology. *See* 42 U.S.C. § 16512–16513 (2006 & Supp. IV 2011).

153 42 U.S.C. § 16516 (Supp. IV 2011).

154 Section 1705 became the subject of much criticism when Solyndra, a solar company that had received a $535 million loan guarantee, declared bankruptcy. *E.g.*, ERNST & YOUNG AUG. 2012, *supra* note 7, at 25.

155 *See* Daniel R. Cahoy, *Investor Enclosure: Abdicating the Green Technology Landscape*, 49 AM. BUS. L.J. 805, 843 (2012); *Latest U.S. Legislation Fails to Provide Extension for Cash-Grant Program*, SOLAR INDUSTRY (Dec. 27, 2011), http://solarindustrymag.com/e107_plugins/content/content.php?content.9396.

156 *E.g.*, THE LAW OF CLEAN ENERGY, *supra* note 17, app. at 559–618; *State Actions on Clean Energy: A Fifty-State Survey*, COLUMBIA L. SCH. CENTER FOR CLIMATE CHANGE L., http://web.law.columbia.edu/climate-change/resources/law-clean-energy/state-actions-clean-energy-fifty-state-survey (last updated June 26, 2011).

157 Mann & Rowe, *supra* note 104, at 155.

emissions and earn funds to invest in renewable energy.[158] Additionally, several states have "clean energy funds," consisting of monies collected through additional charges levied on public utility bills.[159] The funds help finance the use of clean energy.[160]

The most significant state measure is the RPS.[161] An RPS requires electric utilities to source a fraction of their electricity from renewable resources or purchase renewable energy credits (RECs) from other sources to meet the quota.[162] An RPS generally sets a mid- to long-range goal and phases it in over time.[163] Entities that do not comply pay a penalty.[164] Currently, twenty-nine states and the District of Columbia have a mandatory RPS.[165] For example, California requires utilities to procure 33% of the electricity they deliver from renewable resources by 2020.[166] Eight states have renewable portfolio goals, which is a voluntary RPS.[167]

Even though state RPSs have stimulated large amounts of investment,[168] reliance on them is inefficient because they create a patchwork of differing state requirements.[169] For example, even in those states that have adopted an RPS, the requirements vary by precise goal[170] and even in the way they define

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158 Herrick, *supra* note 152, at 196. Examples include the Regional Greenhouse Gas Initiative, REGIONAL GREENHOUSE GAS INITIATIVE, www.rggi.org (last visited July 1, 2013), and the Western Climate Initiative, W. CLIMATE INITIATIVE INC., http://www.wci-inc.org (last visited July 1, 2013).

159 Herrick, *supra* note 152, at 197.

160 *See id.*; *State Clean Energy Funds Fact Sheet*, U.S. ENVTL. PROTECTION AGENCY, www.epa.gov/chp/policies/funds_fs.html (last updated Apr. 2009).

161 *E.g.*, Fershee, *supra* note 49, at 77; Martinot et al., *supra* note 67.

162 *E.g.*, Fershee, *supra* note 49, at 77.

163 *E.g.*, *id.* For example, when California first passed its RPS in 2002, it required utilities to increase their procurement of eligible renewable energy sources by at least 1% of retail sales per year, until reaching 20%. S.B. 1078, 2002 Leg., Reg. Sess. (Cal. 2002).

164 *E.g.*, Fershee, *supra* note 49, at 78.

165 *E.g.*, January 2013 Archive of RPS Data, DSIRE, www.dsireusa.org/rpsdata/index.cfm (last visited June 16, 2013) [hereinafter DSIRE RPS Data Spreadsheet].

166 *See* CAL. PUB. RES. CODE § 25740 (West Supp. 2011). California's RPS was originally 20% by 2017. Cal. S.B. 1078. The deadline to reach 20% was later accelerated to 2010. S.B. 107, 2006 Leg., Reg. Sess. (Cal. 2006). In 2011, the requirement was increased to 33% by 2020. S.B. 2, 2011 Leg., Reg. Sess. (Cal. 2011).

167 *See* DSIRE RPS Data Spreadsheet, *supra* note 165.

168 For example, "[i]t has . . . been estimated that RPSs motivated approximately forty-five percent of the 4300 MW of wind power installed in the United States between 2001 and the end of 2004. Ferrey et al., *supra* note 74, at 150.

169 Benjamin K. Sovacool, *The Best of Both Worlds: Environmental Federalism and the Need for Federal Action on Renewable Energy and Climate Change*, 27 STAN. ENVTL. L.J. 397, 404 (2008); Sovacool & Cooper, *supra* note 65, at 88.

170 For example, Pennsylvania requires that 18% be derived from alternative energy sources within fifteen years after its law took effect, 73 PA. CONS. STAT. ANN. § 1648.3 (West 2008), whereas New York requires

renewable resources.[171] Compliance becomes onerous because utilities do not necessarily operate within one state and therefore must comply with widely differing state laws.[172] For example, American Electric Power serves customers in eleven states, three of which have a mandatory RPS.[173] Thus, it must ensure the renewable energy it uses meets the definition and percentage requirements in all three states. By creating additional compliance costs for utilities, state RPSs unintentionally inflate electricity prices.[174]

The patchwork also creates inefficiencies in the markets for RECs. The differing definitions of renewable energy under state RPSs, including some requirements for in-state generation, limit a utility's ability to purchase an REC from out of state to meet the quota.[175] Such restrictions "thwart the economies of scale that can result from national markets."[176] Additionally, for technologies using resources widely considered renewable, such as wind and solar, a specific project may offer investors a good return more because of the ability to sell the RECs the project generates in numerous states than because of the merits of the project itself.[177]

In addition, reliance on state RPSs does not create long-term predictability because the RPSs themselves are not inherently stable. For example, in several states, such as Connecticut[178] and Maine,[179] there have been attempts to roll

utilities to obtain 30% by 2015. N.Y. Pub. Serv. Comm'n, Order Establishing New RPS Goal and Resolving Main Tier Issues, Case 03-E-0188, at 10 (Jan. 8, 2010); Fershee, *supra* note 49, at 82.

171 *E.g.*, Fershee, *supra* note 49, at 79–80; DSIRE RPS Data Spreadsheet, *supra* note 165 (summarizing RPS resource eligibility by state).

172 Marilyn A. Brown & Sharon (Jess) Chandler, *Governing Confusion: How Statutes, Fiscal Policy, and Regulations Impede Clean Energy Technologies*, 19 STAN. L. & POL'Y REV. 472, 502 (2008); *see also* Fershee, *supra* note 49, at 84 (stating that a national RPS would make compliance easier and more predictable).

173 Sovacool, *supra* note 169, at 455; *see also About Us*, AM. ELECTRIC POWER, http://www.aep.com/about (last visited July 1, 2013) (laying out the states in which it operates); DSIRE RPS Data Spreadsheet, *supra* note 165 (listing the states that have RPSs). The states with an RPS are Michigan, Ohio, and Texas. *Id.* Additionally, four states in which American Electric Power operates—Indiana, Oklahoma, Virginia, and West Virginia—have a voluntary RPS. *Id.*

174 Sovacool & Cooper, *supra* note 65, at 88; *see also* Mormann, *supra* note 57, at 722 (noting that utilities normally pass the additional costs of REC procurement on to customers).

175 Lincoln L. Davies, *Power Forward: The Argument for a National RPS*, 42 CONN. L. REV. 1339, 1364 (2010).

176 Brown & Chandler, *supra* note 172, at 502. One commentator has called the state approach "anachronistic" because the electric utility industry is becoming more national. Sovacool, *supra* note 169, at 455.

177 Sovacool & Cooper, *supra* note 65, at 107–08.

178 *See* Jan Ellen Spiegel, *Connecticut Mulls Rollback on Clean Energy*, N.Y. TIMES (Apr. 8, 2010, 8:45 AM), http://green.blogs.nytimes.com/2010/04/08/Connecticut-mulls-rollback-on-clean-energy/.

back the states' RPSs.[180] Moreover, there is the potential for constitutional challenges.[181] Dormant Commerce Clause challenges have been brought against more than one state that requires in-state generation.[182] No court has yet determined whether such statutes violate the Commerce Clause, but the potential is there, creating uncertainty.[183]

Thus, although state initiatives, and particularly the RPS, have played a crucial role in stimulating investment in renewable energy, they also do not create the long-term, stable environment investors require. This is particularly problematic in states that do not require long-term contracts with renewable-energy power producers because the benefits of any incentives could disappear.[184] As a result, it is more difficult for renewable energy projects to secure financing, and the high cost of any financing available unnecessarily inflates renewable energy prices.

An analysis of Brazil's experiences in the next Part demonstrates that a renewable energy goal can play an important role in an investment framework if implemented uniformly in combination with other tools that create long-term stability, such as long-term contracts. The combination of these tools demonstrates government commitment and creates stability.

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179 *See Maine Passes Ambitious Oil Security Bill, Governor LePage's RPS Rollback Stalls*, GEORGETOWN CLIMATE CENTER (June 23, 2011), http://www.georgetownclimate.org/maine-passes-ambitious-oil-security-bill-governor-lepage-s-rps-rollback-stalls.

180 *See* Brendan Demelle, *Heartland Institute, ALEC and More Gearing Up to Undermine Renewable Energy*, DESMOGBLOG.COM (June 25, 2012, 9:51 PM), http://www.desmogblog.com/heartland-institute-alec-and-more-gearing-undermine-renewable-energy.

181 *E.g.*, Davies, *supra* note 175, at 1368; Ferrey, *supra* note 5, at 92.

182 Davies, *supra* note 175, at 1368.

183 *See* Lana Chow, *The De-Localization Sustainability Initiative: Renewable Energy*, SUSTAINABILITY L. LEWIS & CLARK L. SCH. (Apr. 6, 2011), http://sustainabilityandlaw.com/2011/04/06/the-de-localization-sustainability-initiative-renewable-energy-by-lana-chow/ (discussing challenges brought in Massachusetts and California); *GTH UPDATE Energy: Federal District Court Decisions on Low-Carbon Fuel Standards Affect the Pacific Northwest*, GORDON THOMAS HONEYWELL (Jan. 25, 2012), http://www.gth-law.com/files/gth_update_energy.01.25.2012.pdf (discussing potential for court to rule California mandate unconstitutional under the Commerce Clause).

184 *See* Swisher & Porter, *supra* note 55, at 193; *cf.* COUTURE ET AL., *supra* note 55, at 11–12, 12 n.20 (asserting FITs can help utilities meet RPS mandates in jurisdictions where renewable-energy project developers cannot secure long-term contracts).

## III. BRAZIL'S LEGAL FRAMEWORK TO PROMOTE INVESTMENT IN RENEWABLE ENERGY

Brazil distinguishes itself from the rest of the world in that 43.9% of its energy supply is renewable.[185] Hydropower satisfies approximately 80% of the country's electricity needs.[186] The risk associated with reliance on hydropower became clear in 2001 when severe drought necessitated electricity rationing.[187] As a result, Brazil set out to diversify its energy mix.[188]

Since 2002, Brazil has relied on laws requiring long-term contracts for fixed prices—first through an FIT[189] and more recently through energy auctions—to promote investment in renewable energy.[190] These mechanisms are explored in sections A and B, below. Brazil has also introduced tax incentives (section C) and other mechanisms, including a national development bank (BNDES) and national climate change policy (PNMC) (section D), to complement these laws. These last two measures form an integral part of Brazil's framework as BNDES finances many renewable energy projects,[191] and the PNMC establishes an overarching goal that requires government commitment to renewable energy.

Although Brazil has made multiple policy changes, and also uses short-term tax incentives, its overall framework has evidenced a commitment to developing the renewable energy industry and has provided investors with more long-term predictability than in the United States. While the United States should not simply imitate the framework Brazil created (and likely cannot given differing political climates), the following study of Brazil's legal framework to promote investment in renewable energy can provide the United States with valuable guidance in modifying its own legal framework.

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185 KPMG INT'L, *supra* note 14, at 10. In comparison, the world average is 14% and among developed countries it is 6%. *Id.*

186 LAURA PORTO, MINISTÉRIO DE MINAS E ENERGIA, ENERGIAS RENOVÁVEIS [RENEWABLE ENERGY] (2007), *available at* http://www.mme.gov.br/programas/proinfa/galerias/arquivos/apresentacao/VI.pdf.

187 *See* PSI MEDIA INC., 2010 BRAZIL ENERGY HANDBOOK 11 (2009), *available at* www.psimedia.info/handbooks/Brazil_Energy_Handbook.pdf.

188 *See id.* at 15.

189 *See generally supra* note 98 (describing FIT policies).

190 *See infra* Part III.A–B.

191 *See* RAMÓN FIESTAS, GLOBAL WIND ENERGY COUNCIL & ABEEÓLICA, ANALYSIS OF THE REGULATORY FRAMEWORK FOR WIND POWER GENERATION IN BRAZIL 4, 12–13, *available at* http://gwec.net/wp-content/uploads/2012/06/Brazil_report_2011.pdf; *see also* UNEP & BNEF 2011, *supra* note 4, at 43.

### *A. PROINFA: Long-Term Access to the Grid and a Fair Return*

In 2002, Brazil established the Incentive Program for Alternative Sources of Energy (PROINFA).[192] Unlike PURPA, the goals of which concerned general energy conservation,[193] PROINFA's goals specifically included increasing renewable generation by IPPs.[194] To accomplish that goal, the law guaranteed that state-owned utility Eletrobrás would purchase energy from IPPs.[195] It also required that installations satisfy a minimum national content rule[196] to promote development of a Brazilian manufacturing industry for renewable energy equipment.[197]

The law laid out two phases.[198] Contracts were to be awarded through calls to the public under both, but the parameters differed.[199] During Phase I, Eletrobrás was to enter into twenty-year PPAs for a total of 3,300 MW of installed capacity.[200] Different from PURPA, PROINFA required Eletrobrás to pay power producers prices based on the "economic value" of the technology used.[201] The law set rate floors for each technology[202] and the Executive Branch promulgated further rate guidelines, including an appropriate return on capital and most related costs.[203]

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192 Lei No. 10.438 [Law No. 10.438], de 26 de Abril de 2002, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 29.04.2002 (Braz.).

193 *See supra* Part II.A.

194 Law No. 10.438. Eligible renewable resources were limited to biomass, wind, and small hydroelectric. *Id.*

195 *See id.*

196 The national content requirements were 60% during Phase I and 90% during Phase II. *See* Lei No. 10.762 [Law No. 10.762], de 11 de Novembro de 2003, D.O.U. de 12.11.2003 (Braz.) (amending Law No. 10.438).

197 At the time there was only one manufacturer of wind turbines operating in Brazil. LUIZ BARROSO, RENEWABLE ENERGY AUCTIONS: THE BRAZILIAN EXPERIENCE 7 (2012), *available at* http://siteresources.worldbank.org/INTENERGY2/Resources/4114191-1328286035673/D2_Luiz_Barroso.pdf.

198 Law No. 10.438.

199 *Id.*; Law No. 10.762.

200 Lei No. 10.889 [Law No. 10.889], de 25 de Junho de 2004, D.O.U. de 28.06.2004 (Braz.). As enacted, PROINFA required Eletrobrás to enter into fifteen-year contracts. Law No. 10.438. That requirement changed to twenty-year contracts in 2004. Law No. 10.889.

201 Law No. 10.438.

202 Law No. 10.762. The floors were originally set at 80% of the average national tariff to the consumer but were amended in 2003 to: 50% of the average national tariff to the consumer for biomass; 70% for small hydro; and 90% for wind. *Id.*; Law No. 10.438. Germany's FIT legislation, which many countries have copied, included a similar pricing scheme except that the floors for biomass and small hydro were higher. *See* Swisher & Porter, *supra* note 55, at 193.

203 Decreto No. 5.025 [Decree No. 5.025], de 30 de Março de 2004, D.O.U. de 31.03.2004 (Braz.).

During Phase II, Eletrobrás was to enter into contracts with power producers so that renewable energy supplied 10% of the country's annual electric consumption within twenty years from the beginning of Phase I.[204] Phase II has not been implemented, however, and it is possible that it never will be given the new regulatory framework discussed in the next section.[205]

The costs of PROINFA were to be absorbed by the ratepayers.[206]

### *B. A Switch in Strategy to Power Auctions*

The year 2004 brought a new framework for the power sector—a hybrid approach that split the sector into regulated and unregulated markets for different producers and consumers—but maintained the requirement that suppliers enter into long-term contracts with IPPs.[207] Among the goals of the new model were security of supply, lower tariffs, and a just return to investors.[208] The framework "features a strict planning of the sector"[209] and requires electricity distributors to purchase energy only through competitive tenders.[210]

Long-term contracts—between three and fifteen years for existing projects and between fifteen and thirty-five years for new projects—are awarded through government auctions.[211] Requiring long-term contracts ensures a stable return to investors and helps finance the sector's expansion.[212] Under the new

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[204] Law No. 10.438.

[205] BARROSO, *supra* note 197, at 6; OSVALDO SOLIANO PEREIRA, CENTRO BRASILEIRO DE ENERGIA E MUDANÇA DO CLIMA, LEAP INTO GREEN GROWTH: PROMOTING CLEAN TECHNOLOGY MANUFACTURING (2011), *available at* http://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/Policy%20and%20regulatory%20issues%20Brazil.pdf.

[206] Law No. 10.438; PEREIRA, *supra* note 205.

[207] Lei No. 10.848 [Law No. 10.848], de 15 de Março de 2004, D.O.U. de 16.03.2004 (Braz.); *Country Analysis Briefs: Brazil*, U.S. ENERGY INFO. ADMIN., http://www.eia.gov/cabs/brazil/Full.html (last updated Feb. 28, 2012).

[208] *See, e.g.*, CENTRO DE ESTUDOS DAS SOCIEDADES DE ADVOGADOS, LEGAL GUIDE FOR THE FOREIGN INVESTOR IN BRAZIL 159 (2006); PEREIRA, *supra* note 205.

[209] CENTRO DE ESTUDOS DAS SOCIEDADES DE ADVOGADOS, *supra* note 208, at 149.

[210] Law No. 10.848; PSI MEDIA INC., *supra* note 187, at 11. This governs the purchase of all energy, not just renewable energy, to ensure adequate supply. *See* LUIZ AUGUSTO BARROSO ET AL., AUCTIONS OF CONTRACTS AND ENERGY CALL OPTIONS TO ENSURE SUPPLY ADEQUACY IN THE SECOND STAGE OF THE BRAZILIAN POWER SECTOR REFORM 4–5 (2006), *available at* www.psr-inc.com/psr/download/papers/Brazil_paper_GM0205.pdf.

[211] Law No. 10.848.

[212] CENTRO DE ESTUDOS DAS SOCIEDADES DE ADVOGADOS, *supra* note 208, at 157.

model, there have been auctions specifically for new renewable energy projects.[213]

### *C. Complementary Tax Incentives*

Although the primary impetus behind investment in renewable energy in Brazil has been programs awarding long-term contracts to IPPs, Brazil has enacted complementary tax incentives. For example, in 2007, Brazil adopted a special incentive program to promote investment in infrastructure projects (REIDI).[214] Entities that buy or import new instruments for use in an infrastructure project are exempted for up to five years from paying two types of taxes related to that purchase.[215]

Additionally, there are tax incentives specific to renewable energy. Wind and solar generating equipment may be exempt from sales tax (ICMS) through 2015.[216] This exemption was first adopted in 1997.[217] As with the tax credits in the United States, it is not stable—it has been modified various times since it was first adopted and has been extended on multiple occasions for only short periods of time (anywhere from one month to three years at a time).[218] Also for wind equipment there is an exemption from a tax on industrialized products.[219]

More recently, in April 2012, regulations were adopted allowing solar plants of up to 30 MW that begin commercial operation by December 31, 2017, a discount of 80% on distribution and transmission tariffs for the first ten years of operation.[220]

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213 Marília Rabelo Corrêa, *Renewable Energy in Brazil - Perspectives*, http://65.110.85.160/academy/magazine/RENEWABLE%20ENERGY%20IN%20BRAZIL%20-%20E-MAGAZINE.pdf (last visited June 17, 2013).

214 Lei No. 11.488 [Law No. 11.488], de 15 de Junho de 2007, D.O.U. de 15.06.2007 (Braz.).

215 *Id.*

216 Convênio ICMS 75 [Agreement ICMS 75], de 14 de Julho de 2011, D.O.U. de 18.07.2011 (Braz.). It has been reported that this exemption provides a benefit of up to 17%. *Confaz prorroga isenção de ICMS para energia eólica* [*Confaz Extends ICMS Exemption for Wind Energy*], BRASELCO, http://www.braselco.com.br/index.php?option=com_content&view=article&id=106:confaz-prorroga-isencao-de-icms-para-energia-eolica&catid=4:noticias&Itemid=4&lang=en (last visited June 1, 2013).

217 Convênio ICMS 101 [Agreement ICMS 101], de 12 de Dezembro de 1997, D.O.U. de 18.12.1997 (Braz.).

218 *See Confaz Extends ICMS Exemption for Wind Energy*, *supra* note 216; *Convênio ICMS 101/97*, MINISTÉRIO DA FAZENDA, www.fazenda.gov.br/confaz/confaz/convenios/ICMS/1997/CV101_97.htm (last visited June 1, 2013).

219 Christiana Sciaudone, *Brazil Exempts Imported Wind Equipment from 14% Tax*, RECHARGE NEWS, http://www.rechargenews.com/news/americas/article1283053.ece (last updated Nov. 25, 2012).

220 Resolução Normativa No. 481 [Normative Resolution No. 481], de 17 de Abril de 2012, D.O.U. de 20.04.2012 (Braz.); *ANEEL Approves Rules to Facilitate the Generation of Energy in Consumer Units*,

### *D. Development Bank and Climate Change Policy Round Out the Framework*

Additional non-tax mechanisms play a significant role in Brazil's framework today. One of the most important is BNDES,[221] which offers financing for renewable energy projects.[222] Generally, BNDES offers favorable terms including, for example, sixteen-year loans with interest rates lower than the central bank benchmark rate.[223]

Additionally, in December 2009, Brazil adopted the PNMC.[224] The PNMC has among its goals the compatibility of social–economic development, protection against climate change, and the reduction of GHG emissions.[225] It commits to reducing GHG emissions in Brazil between 36.1% and 38.9% by 2020.[226] A presidential decree outlined a plan for accomplishing this goal, including increased use of electricity generated from renewable resources.[227]

Thus, over the past decade Brazil has helped ensure that renewable energy projects could secure financing by guaranteeing investors a fixed return through a long-term contract[228] and by providing cost-effective loans.[229] Recently, Brazil has enacted additional measures targeting renewable energy to complement the long-term contracts. These measures have not been implemented without error, however. For example, Brazil has undermined its efforts to some extent by abandoning Phase II of PROINFA[230] and by enacting only short-term tax incentives.[231] Nevertheless, the overall commitment the

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AGÉNCIA NACIONAL DE ENERGIA ELÉTRICA (Apr. 17, 2012), http://www.aneel.gov.br/aplicacoes/noticias_area/dsp_detalheNoticia.cfm?idNoticia=5461&idAreaNoticia=347.

221 *See* BNDES, www.bndes.gov.br/SiteBNDES/bndes/bndes_en/ (last visited July 1, 2013).

222 FIESTAS, *supra* note 191, at 12–13; *see* UNEP & BNEF 2011, *supra* note 4, at 43.

223 *See* Stephan Nielsen, *BNDES Shuts Five Firms Out of Brazil Wind Turbine Market*, RENEWABLE ENERGY WORLD.COM (July 20, 2012), http://www.renewableenergyworld.com/rea/news/article/2012/07/bndes-shuts-five-firms-out-of-brazil-wind-turbine-market. In July 2012, BNDES terminated financing for five large wind-turbine manufacturers in Brazil because they failed to meet the local content rule requiring turbine makers to source 40% of their components from Brazilian suppliers. *Id.* This caused Brazil to fall back down to number ten in the Ernst & Young Renewable Energy Country Attractiveness Indices. ERNST & YOUNG AUG. 2012, *supra* note 7, at 21.

224 Lei No. 12.187 [Law No. 12.187], de 29 de Dezembro de 2009, D.O.U. de 29.12.2009 (Braz.).

225 *Id.*

226 *Id.*

227 Decreto No. 7.390 [Decree No. 7.390], de 9 de Dezembro de 2010, D.O.U. de 10.12.2010 (Braz.).

228 *See supra* Part III.A–B.

229 *See supra* note 223 and accompanying text.

230 *See supra* note 205 and accompanying text.

231 *See supra* note 218 and accompanying text. Most recently, Brazil has undermined its efforts by cancelling energy auctions, which contributed to its fall in the May 2013 Ernst & Young Renewable Energy Country Attractiveness Indices. *See supra* note 15.

country has shown to renewable energy has created more long-term predictability for investors than in the United States. The following Part draws lessons from Brazil's experience through an examination of its successes and failures.

## IV. LESSONS FROM BRAZIL'S EXPERIENCES

Brazil's attempts to diversify its electrical energy matrix earned it recognition as a renewable energy powerhouse and for its corresponding increase in planned renewable energy investments.[232] Part III's examination of Brazil's legal framework, designed to promote investment in renewable energy, provides valuable insight into those elements that give investors the long-term predictability they need to make cost-effective investment commitments. The United States should not simply copy Brazil because the most appropriate framework for a particular country depends on the country's political, economic, and environmental conditions (and because Brazil's framework is not perfect).[233] However, the United States should apply the following four lessons to create an efficient legal framework: (1) long-term contracts are crucial; (2) prices matter; (3) tax incentives should supplement, but not be the principal focus of, the framework; and (4) renewable energy use goals can ensure that contracts are made in a cost-effective manner. These lessons are discussed below in sections A to D, respectively.

### *A. Nonutility Power Producers Need Access to Long-Term Contracts*

The most stable element of Brazil's legal framework to promote investment in renewable energy during the past decade has been the mandatory long-term contract or PPA.[234] Although Brazil's framework has changed multiple times—from an FIT and quota under PROINFA to a competitive auction

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[232] *See supra* note 15 and accompanying text. In addition to its rapid increase in the rankings as an attractive country for renewable energy investment between 2009 and 2011, Brazil's successes have been demonstrated by the record low prices at which renewable energy has been contracted for. Stephan Nielsen & Christiana Sciaudone, *Wind Power Sells at World's Lowest Rate in Brazil Auction*, BLOOMBERG (Dec. 14, 2012, 9:01 PM), www.bloomberg.com/news/2012-12-14/four-developers-sign-wind-contracts-in-brazil-for-282-megawatts.html.

[233] Neuhoff, *supra* note 58, at 315; Swisher & Porter, *supra* note 55, at 185.

[234] *See supra* Part III.A–B; *cf.* Laurens J. de Vries, *Mandatory Long-Term Contracts for Renewable Energy: The Best of Both Worlds?*, *in* 2011 8TH INTERNATIONAL CONFERENCE ON THE EUROPEAN ENERGY MARKET (EEM) 586, 589 (2011), *available at* http://www.nextgenerationinfrastructures.eu/download.php?field=document&itemID=585188 (noting that Brazil has found the solution to ensuring adequate generating capacity in long-term contracts).

system—it has consistently provided renewable-energy power producers with access to long-term PPAs.[235]

Long-term contracts mitigate risk by guaranteeing that power producers receive an established price for a certain amount of generation over the life of the contract.[236] By locking in a buyer and a price, these contracts alleviate concerns that a power producer will not be able to sell the electricity it produces and earn a fair return on the investment.[237] They allow capital-intensive and risky renewable energy projects to secure financing because investors can calculate their return and creditors can feel confident that the borrower will repay any loan extended.[238] Thus, a long-term contract provides the long-term stability investors and creditors need to commit to financing a renewable energy project.[239]

A firm commitment to long-term contracting over the past decade has also added much-needed stability to the investment environment in Brazil. For various reasons, such as frequent prolongation of PROINFA's Phase I, abandonment of Phase II, and short-term extensions of tax benefits, Brazil's approach likely created some uncertainty among investors.[240] In fact, three days before the first wind auction in 2009, the sales tax incentive[241] was extended only one month.[242] The executive director of wind energy organization ABEEólica speculated that about 30% of the projects that had

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235 *See supra* Part III.A–B.

236 *See Disputa entre Ceará e Rio Grande do Norte* [*Dispute Between Ceará and Rio Grande do Norte*], BRASELCO, http://www.braselco.com.br/index.php?option=com_content&view=article&id=138%3Adisputa-entre-ceara-e-rio-grande-do-norte&catid=4%3Anoticias&Itemid=4&lang=en (last visited Feb. 16, 2012); *cf.* de Vries, *supra* note 234, at 588 (asserting that if short-term pricing continues to dominate the electricity market, investment risk will increase and the unpredictability will discourage the investment needed to reduce fossil fuel consumption and carbon emissions).

237 *See* Sérgio Ruck Bueno, *Associação prevê redução no preço da energia eólica no leilão A-5* [*Association Predicts Price Reduction of Wind Energy*], VALOR (Apr. 10, 2011, 3:23 PM), http://www.valor.com.br/empresas/1035504/associacao-preve-reducao-no-preco-da-energia-eolica-no-leilao-5; *Dispute Between Ceará and Rio Grande do Norte*, *supra* note 236.

238 *See* COUTURE ET AL., *supra* note 55, at viii–ix; *see also* Wellington Bahnemann, *Mudança põe em risco leilão de energia eólica* [*Change Puts Wind Energy Auction at Risk*], ESTADÃO (Dec. 14, 2009), http://www.estadao.com.br/noticias/impresso,mudanca-poe-em-risco-leilao-de-energia-eolica,481524,0.htm (discussing the need for investors to recalculate project viability after tax credit was not extended); *Dispute Between Ceará and Rio Grande do Norte*, *supra* note 236.

239 *See* Neuhoff, *supra* note 58, at 314 ("Regulatory risk can be reduced if policies provide legally enforceable long-term guarantees.").

240 *See* Mallon, *supra* note 140, at 25 (cautioning against excessive policy change); Bahnemann, *supra* note 238 (discussing the potential effect of the short-term sales tax extension on the first wind energy auction).

241 *See supra* notes 216–18 and accompanying text.

242 Bahnemann, *supra* note 238.

signed up for the auction would not participate as a result.[243] In the end, however, the auction took place as planned and 1,806 MW were contracted for at an average price about 21% below the auction's ceiling price,[244] which had been set based on a continuing sales tax incentive.[245]

Therefore, Brazil has been able to promote renewable energy development despite some evidence of unstable policies. Its success is likely due to a demonstrated overall societal commitment to renewable energy through continued reliance on long-term contracting,[246] as well as the insulation that those contracts provide from policy changes.[247] Even though investors may not be assured of a sales tax incentive over the life of a project, they can rely on having a buyer for their energy at a fixed price, which is a greater guarantee than many investors in the United States receive.

It is important to note that the contract terms must be appropriate for the country's investment climate and industry development.[248] In Brazil, although Eletrobrás was able to enter contracts for the full amount of renewable energy generation required under PROINFA,[249] many of the projects contracted for took many years to build, causing several extensions of PROINFA.[250] The problems were attributed to various causes including developers' inability to meet national content requirements for wind turbines and high interest rates.[251] These problems were corrected as foreign wind manufacturers entered Brazil[252] and the cost of wind energy fell.[253] The repeated extension of PROINFA, however, likely caused uncertainty in the meantime.[254]

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243 *Id.*

244 Press Release, Empresa de Pesquisa Energética, Primeiro leilão de energia eólica do país viabiliza a construção de 1.805,7 MW [Country's First Wind Auction Secures Construction of 1,805.7 MW] (Dec. 14, 2009), *available at* http://www.epe.gov.br/imprensa/PressReleases/20091214_1.pdf.

245 Bahnemann, *supra* note 238.

246 *Cf.* Karl Mallon, *Ten Features of Successful Renewable Markets*, *in* RENEWABLE ENERGY POLICY AND POLITICS, *supra* note 55, at 35, 62–64 (arguing that an overarching statement of objective allows for changes to be made within a policy framework without destabilizing the industry).

247 *See* Neuhoff, *supra* note 58, at 314.

248 *See* UNITED NATIONS ECON. COMM'N FOR EUR., FINANCING GLOBAL CLIMATE CHANGE MITIGATION 45–46 (2010), *available at* http://ynccf.net/pdf/Climate_Finanace/GEE21_GlobalClimateChangeMitigation_ESE37.pdf (discussing the creation of effective financing mechanisms).

249 *See* PORTO, *supra* note 186 (showing that a total of 3,299.40 MW were contracted for under PROINFA).

250 *See* FIESTAS, *supra* note 191, at 5.

251 Edward Russell, *Not a Breeze*, PROJECT FIN., July 2011, at 43.

252 Gabriela Elizondo Azuela & Luiz Augusto Barroso, *Design and Performance of Policy Instruments to Promote the Development of Renewable Energy: Emerging Experience in Selected Developing Countries* 16 (World Bank, Energy & Mining Sector Bd. Discussion Paper No. 22, 2011) (attributing the entrance of foreign manufacturers to renewable energy auctions). Ultimately, national content requirements appear to have

### *B. The Price Must Be Right*

Brazil's experience demonstrates not only the importance of locking in a price, but also of getting that price right. Ultimately, the price offered to renewable energy projects determines whether a developer will commit to investing in the project.[255]

A comparison of the performance of Brazil's biomass sector under PROINFA and the auction mechanism suggests that price plays a central role in encouraging investment in renewable energy projects. PROINFA set price floors depending on the technology used, with that for biomass as the lowest.[256] The price ultimately set varied by specific source material but was only about half the price of wind.[257] Under this pricing scheme, Eletrobrás's request for bids resulted in contracts for less than 700 MW of biomass energy,[258] rather than the 1,100 MW initially allotted.[259] The auctions, in contrast, resulted in 3,515 MW of new biomass capacity by 2010.[260] Evidently, many more biomass projects were contracted for under the competitive auction system than under PROINFA. Given this, and the emphasis commentators place on the importance of not setting the price under an FIT too low,[261] it

benefitted Brazil to some extent by attracting foreign manufacturers to set up shop in the country, but the requirements were unrealistic to apply immediately and made it impossible to complete PROINFA on time.

253 *See* Russell, *supra* note 251.

254 *See* Mallon, *supra* note 140, at 25 (cautioning against excessive policy change).

255 *See* COUTURE ET AL., *supra* note 55, at vii ("A comparison of FIT policies suggests that those that are most effective in meeting deployment objectives have designed their FIT payments to cover the [renewable energy] project cost, plus an estimated profit. This effectiveness arises from the fact that developers are reluctant to invest unless they are relatively certain that the revenue streams generated from overall electricity sales are adequate to cover costs and ensure a return." (citations omitted)); Swisher & Porter, *supra* note 55, at 195 (noting that the price is a critical factor of an FIT).

256 Lei No. 10.438 [Law No. 10.438], de 26 de Abril de 2002, D.O.U. de 29.04.2002 (Braz.).

257 *See* PEREIRA, *supra* note 205. For example, whereas the price for bagasse was about $.03/kWh, the price for wind power ranged between $.058 and $.066/kWh. *Id.*

258 *See* PORTO, *supra* note 186, at 6.

259 PEREIRA, *supra* note 205 (noting that during Phase I, 1,100 MW were allotted to each technology, including biomass).

260 MAURICIO T. TOLMASQUIM, EMPRESA DE PESQUISA ENERGÉTICA, OUTLOOK FOR ALTERNATIVE RENEWABLE ENERGY IN BRAZIL (2010), *available at* http://www.iamericas.org/lajolla/Presentations/Mauricio%20Tolmasquim.pdf.

261 *See, e.g.*, COUTURE ET AL., *supra* note 55, at vii ("A comparison of FIT policies suggests that those that are most effective in meeting deployment objectives have designed their FIT payments to cover the [renewable energy] project cost, plus an estimated profit. This effectiveness arises from the fact that developers are reluctant to invest unless they are relatively certain that the revenue streams generated from overall electricity sales are adequate to cover costs and ensure a return." (citations omitted)); Swisher & Porter, *supra* note 55, at 195 (noting that if an FIT's price is set too low, there will be insufficient market incentive for renewable energy development to occur).

seems that at least part of the reason why biomass did not perform well under PROINFA may have been that the prices were set too low.[262] Differently, at the auctions developers bid their own prices.[263]

In contrast, the wind industry's experience suggests that a price that ensures investors earn a fair return can do wonders for the development of a nascent industry.[264] PROINFA, as amended in 2003, set the highest price floor for wind of the three types of renewable energy projects targeted.[265] Eletrobrás received enough bids for wind projects such that a portion of the quota originally allotted for biomass capacity was reallocated to wind projects and contracts were successfully entered for this additional amount.[266]

Under the auction mechanism, the prices for wind generation have fallen drastically—prices granted to wind projects at auctions have been as low as about 50% lower than PROINFA prices[267] and on par with or even lower than hydroelectricity and natural gas prices.[268] These low prices do not mean necessarily that wind was overpriced under PROINFA.[269] As Hamilton Moss of the Brazilian Ministry of Mines and Energy (MME) explained, "Wind development in Brazil is a perfect demonstration of basic economic laws . . . . With competition, we pushed the price down. . . . People became interested in building factories here, so we have a complete chain of producers

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[262] *See* PEREIRA, *supra* note 205 (pointing out that the premium tariff for biomass was very low and that part of the quota for biomass was reallocated to wind and small hydro); *MME desiste de preencher cota de biomassa no Proinfa* [MME Gives Up on Filling Biomass Quota Under PROINFA], JORNALCANA (Feb. 24, 2005, 9:37 AM), http://www.jornalcana.com.br/noticia/Jornal-Cana/9963+MME-desiste-de-preencher-cota-de-biomassa-no-Proinfa (reporting that industry blamed the inability to contract for 1,100 MW of biomass capacity under PROINFA on the low price to be paid by Eletrobrás).

[263] Nielsen & Sciaudone, *supra* note 232.

[264] As of 2011, over 97% of all wind power installations in Brazil were PROINFA projects. FIESTAS, *supra* note 191, at 5.

[265] *See* Lei No. 10.762 [Law No. 10.762], de 11 de Novembro de 2003, D.O.U. de 12.11.2003 (Braz.).

[266] *See* PORTO, *supra* note 186 (showing that contracts for 1,422.92 MW of wind power were entered into under PROINFA). The original allotment to wind power under PROINFA was 1,100 MW. PEREIRA, *supra* note 205 (noting that during Phase I, 1,100 MW were allotted to each technology).

[267] FIESTAS, *supra* note 191, at 12.

[268] *See* Renewable Energy World Editors, *Price of Wind Lower than Gas, Hydro in Brazil Auction*, RENEWABLE ENERGY WORLD.COM (Aug. 18, 2011), http://www.renewableenergyworld.com/rea/news/article/2011/08/price-of-wind-lower-than-gas-hydro-in-brazil-auction. These prices may reflect recent tax incentives, in part, but they have continued dropping even since the tax incentives were enacted.

[269] Although, it has been noted that prices based on average retail prices, as in Brazil, can lead to windfall profits in the event that electricity prices increase. *See* COUTURE ET AL., *supra* note 55, at 21.

here now and they have prospered."[270] In other words, the high PROINFA prices allowed investors to take a risk and the wind industry to gain the experience it needed to lower costs and compete with more established types of energy.

While wind's competitiveness in Brazil is momentous, it is crucial to note the following: the price of wind fell below those of hydro and natural gas in late 2011, so it remains to be seen whether all projects will get financed and built;[271] it remains to be seen whether prices will remain that low;[272] and Brazil promoted wind because of the vast wind resources it has[273] so replication will depend on a country's specific environmental endowment. Despite these cautions, Brazil's experience does suggest that a firm commitment to renewable energy development and competition among power projects can drive prices down.

Thus, as the varied experiences of wind and biomass in Brazil suggest, offering renewable-energy power producers an appropriate price is crucial. Just providing for a long-term contract that locks in a fixed price is not sufficient. To encourage developers to actually commit to renewable energy projects, the long-term contract must ensure a price that will allow the project's investors to earn a fair return and the creditors to recover the loan.[274] Multiple mechanisms can be used to set the price. In Brazil, under PROINFA, the government set a premium price for each technology.[275] Under the auction system, however, the government merely sets a ceiling price and power projects bid for contracts. A

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[270] Herman K. Trabish, *How Did Wind Beat the Price of Natural Gas in Brazil?*, GREENTECHMEDIA (Aug. 29, 2011), http://www.greentechmedia.com/articles/read/how-did-wind-beat-the-price-of-natural-gas-in-brazil (internal quotation marks omitted); *accord* Bueno, *supra* note 237.

[271] *See* G. Cunha et al., *Fostering Wind Power Through Auctions: The Brazilian Experience*, IAEE ENERGY F. (Int'l Ass'n for Energy Econ., Cleveland, Ohio), Second Quarter 2012, at 25, 27 (noting that of seventy-two wind farms auctioned in 2009, construction of fifty-two of them is already behind schedule); Nielsen & Sciaudone, *supra* note 232 ("The price is prompting concern that some of the planned wind farms won't get built.").

[272] *See* Nielsen & Sciaudone, *supra* note 232 ("'This fall in prices isn't indicative of where prices for wind energy [are] going in Brazil.'").

[273] *See* PORTO, *supra* note 186 (noting that Brazil has a large proven potential for wind energy use).

[274] *Cf.* UNITED NATIONS ECON. COMM'N FOR EUR., *supra* note 248, at 10 (stating that bankers take "significant comfort" from FITs).

[275] Some commentators have argued that this type of price-setting mechanism has been the most successful at driving renewable energy development around the world. *See, e.g.*, Peter Lynch, *Feed-In Tariffs: The Proven Road NOT Taken . . . Why?*, RENEWABLE ENERGY WORLD.COM (Nov. 23, 2011), http://www.renewableenergyworld.com/rea/news/article/2011/11/feed-in-tariffs-the-proven-road-not-takenwhy ("The FIT has proven superior to any other program currently in use around the world . . . ."). As the case of biomass in Brazil suggests, however, it only works if the price is set accurately. *See supra* note 262 and accompanying text.

competitive system of this sort would be more palatable in the United States where emphasis is placed on market competition.[276]

### *C. Tax Incentives Should Complement Rather than Dominate Other Incentives*

Tax incentives aimed at promoting investment in renewable energy may be a useful component of an overall renewable energy framework because they help signal government commitment to investors.[277] On their own, however, they are not stable enough to promote continuous investment in renewable energy.[278]

That tax incentives perform better as a complement to long-term contracting than as the crux of a renewable energy framework becomes clear when comparing the performance of renewable energy programs in Brazil and the United States. In Brazil, PROINFA's focus was ensuring a fair return in the long run; tax incentives played little role.[279] PROINFA successfully encouraged investors to commit resources to renewable energy projects without relying on tax incentives.[280] Their introduction, however, has shown that they may be helpful in combination with long-term contracting. Over the years, Brazil has incrementally changed its framework and included tax incentives; at the same time its renewable energy investment has increased and Brazil has gained more recognition as a renewable energy powerhouse. Unlike in the United States, however, even when tax incentives have been in imminent danger of expiration, Brazil's system based on auctions for long-term contracts has been able to retain a majority of planned investments.[281]

In contrast, in the United States, as tax incentives have become more important, the United States' ability to instill confidence in investors has decreased, resulting in a boom-and-bust investment cycle.[282] At the same time, the United States has lost its status as global leader in new renewable energy

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276 *See* Swisher & Porter, *supra* note 55, at 196.

277 *See* Bahnemann, *supra* note 238.

278 Brown & Chandler, *supra* note 172, at 486 ("Policies that subsidize energy technologies on an inconsistent and sporadic basis do not motivate rational market behavior.").

279 *See supra* Part III.A.

280 Presidential Decree No. 5.025 also worked to ensure that investors did not receive a windfall from investing in renewable energy projects by requiring those contracts entered into to include a price adjustment for any incentives that became available. *See* Decreto No. 5.025 [Decree No. 5.025], de 30 de Março de 2004, D.O.U. de 31.03.2004 (Braz.).

281 *See supra* notes 242–45 and accompanying text.

282 *See supra* Part II.B.

investment.[283] Comparing the United States to Brazil, thus, demonstrates that while tax incentives may form part of a legal framework to promote investment in renewable energy, they should not be the focus.[284]

Brazil's success results from an overall framework that has provided investors with a relatively high level of long-term predictability regarding their investment.[285] Tax incentives are one piece that has helped stimulate additional investment, but they have not been the most important component. Furthermore, when implementing tax incentives it is important to keep in mind the cautions discussed previously. Tax incentives should not create additional costs and should be available to all who need them.[286] Brazil has accomplished this by extending sales tax incentives[287] rather than relying on tax benefits that necessitate large incomes or outside investors as the United States does.[288]

### *D. Renewable Energy Targets Ensure Contracts Are Made and Minimize Cost*

Requiring utilities to only source a minimum amount of electricity from renewable resources can ensure that renewable-energy power producers get the financing they need while limiting the cost of the program. For the most part, renewable electricity is more costly than electricity from conventional sources.[289] So a blanket policy requiring utilities to buy all renewable electricity that power producers offer like the FITs adopted in some countries would be costly.[290] Requiring utilities to enter into a limited number of contracts with power producers that use renewable resources can limit the cost.

Brazil has employed various goals related to renewable energy to spur investment. PROINFA required Eletrobrás to contract for 3,300 MW of renewable energy during Phase I.[291] While placing a cap on the amount of

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[283] *See supra* note 6 and accompanying text. While the United States regained the position of most attractive country for renewable energy in May 2013, it is impossible to say whether this will continue, as the increase in the rankings is a departure from the trend of recent years. *See supra* note 7 and accompanying text.

[284] Even if the political will exists to commit to long-term tax incentives, the other concerns regarding tax incentives discussed previously remain. *See supra* text accompanying notes 117–28.

[285] *See* Mallon, *supra* note 246, at 64 (discussing the importance of an overall framework).

[286] *See supra* notes 117–22 and accompanying text.

[287] *See supra* text accompanying notes 216–19.

[288] *See supra* text accompanying notes 121–26.

[289] David R. Baker, *Renewable Energy Costs Are Starting to Come Down*, SFGATE (Feb. 4, 2012, 4:00 AM), http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2012/02/03/BUMP1N30MP.DTL.

[290] *See* Swisher & Porter, *supra* note 55, at 196 (discussing greater cost impacts on some utilities than others in Germany).

[291] *See supra* Part III.A.

renewable energy that Eletrobrás had to contract for under PROINFA may have inhibited more rapid industry growth than otherwise could have occurred without a cap,[292] it also helped minimize total program costs.[293]

Although Phase II, which would have required 10% of electricity to come from renewable resources, was never implemented, Brazil has not abandoned the concept of establishing a goal pertaining to renewable energy use. The PNMC requires Brazil's people and businesses to reduce GHG emissions in part through the increased use of renewable energy.[294] This policy can work together with Brazil's other incentives to ensure a sufficient amount of renewable energy is purchased. Given Brazil's focus on a few types of renewable resources and the current ability of those resources to compete on price with conventional power generation,[295] this mechanism appears sufficient for Brazil for now. Even if the PNMC does not provide as much incentive as an RPS, it does add stability to the framework by signaling government commitment to investors, even when individual elements of the framework are modified.[296]

Comparing the United States' performance with that of Brazil further highlights the importance of using a renewable energy goal in conjunction with long-term contracting requirements. The ability of states to meet their RPS goals has varied. Texas, for example, required long-term contracts when its RPS was implemented and very rapidly got ahead of schedule in meeting its goal.[297] In contrast, those states without long-term contracting requirements had more trouble meeting their mandates.[298] These examples demonstrate that an RPS works best in conjunction with other policies to create a cost-effective framework.

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[292] *Cf.* Mallon, *supra* note 140, at 23 ("Caps are great for limiting problems, but are a nightmare for building solutions. . . . Once capacity meeting the long-term energy cap is in place, a complete halt in activity will ensue.").

[293] According to a discussion paper by Gabriela Elizondo Azuela and Luiz Augusto Barroso, "the total annual cost originating from [renewable energy] generation triggered by both PROINFA and auctions is estimated at [$]1.38 billion per year and [$]911 million per year, respectively." Azuela & Barroso, *supra* note 252, at 29. The impact on consumer tariffs, once the costs are spread across ratepayers, is negligible at 1.35% from PROINFA and 0.6% from auctioned capacity. *Id.*

[294] *See supra* Part III.D.

[295] *See supra* note 268 and accompanying text.

[296] *See* Mallon, *supra* note 246, at 62–64.

[297] Martinot et al., *supra* note 67.

[298] *Id.*

The United States certainly should not merely imitate Brazil's framework. First, a framework must be appropriate for a country's conditions.[299] Second, Brazil has not created a completely stable investment environment. In some ways, instability in Brazil has similar causes as in the United States—a lack of commitment to a specific law. Furthermore, a start-and-stop investment environment is somewhat inherent to the auction mechanism that Brazil has chosen because new capacity can only receive contracts under periodic auctions.[300]

Nevertheless, Brazil's overall commitment to providing power producers with access to long-term contracts, complemented by other mechanisms, has demonstrated that Brazil is serious about renewable energy.[301] Furthermore, because power producers receive long-term contracts, investors and creditors need worry less about potential future changes to the country's energy policy.[302]

The United States, in contrast, has largely failed to quell investor fears for more than a couple of years at a time.[303] Part V recommends a new framework for the United States based on the lessons from Brazil. The framework's focus is mandatory long-term contracts entered through a market-based, competitive process to meet the requirements of a national RPS.

## V. RECOMMENDATIONS FOR THE UNITED STATES

To recover its position as global leader in renewable energy investment and ensure long-term sustainable economic growth, the United States must revamp its legal framework to encourage continuous investment in renewable energy. Under this new recommended framework, the federal government must assert itself more because, as one commentator has said, "when environmental problems are national or international in scope, only interactive federalism captures all of these benefits while minimizing the deficiencies."[304]

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299 *See* Neuhoff, *supra* note 58, at 315.

300 Azuela & Barroso, *supra* note 252, at 40.

301 *Cf.* Swisher & Porter, *supra* note 55, at 196 ("The key to a booming European wind market, however, has been policies that have been relatively stable and long term . . . .").

302 *See* Neuhoff, *supra* note 58, at 314.

303 Some states do a better job than others in filling the gaps in the federal framework and addressing investors' concerns.

304 Sovacool, *supra* note 169, at 475; *accord* Garrick B. Pursley & Hannah J. Wiseman, *Local Energy*, 60 EMORY L.J. 877, 881 (2011) (advocating "enhanced local authority" in the context of minimum federal regulatory standards "to ameliorate the negative consequences of regulatory competition"). *But see* Brian Jansen, Comment, *Community Wind Power: Making More Americans Energy Producers Through Feed-In*

The centerpiece of this new legal model should be a national RPS requiring electric utilities to source a specific percentage of the electricity they supply to consumers through long-term contracts with nonutility power producers using renewable resources.[305] To minimize any costs associated with compliance, however, a utility should be allowed to generate its own electricity using renewable resources if it can do so more cheaply than the competing nonutility power producers. Once a utility reaches the minimum percentage, it could enter into more long-term contracts with renewable-energy power producers, or generate more electricity from renewables itself, but would not be required to. Other pieces of the current legal framework, such as tax incentives, could form part of the new legal framework but should no longer be the primary federal incentive to renewable energy development.

This suggested framework would provide the long-term predictability that renewable-energy project developers need to secure low-cost financing. In that respect, it would reduce many unnecessary development costs that the current legal framework creates, leading to more investment and lower renewable energy prices.[306] First, section A discusses the long-term PPAs that utilities would be required to enter with nonutility power producers that use renewable resources. Section B then analyzes the role the national RPS would play in creating a competitive process to minimize the cost of contracting with renewable-energy power producers. Lastly, section C addresses potential concerns regarding the recommended legal framework, including jurisdictional issues and increased electricity costs.

### *A. A Framework Based on Long-Term Contracting*

To create a stable investment environment in which potential renewable energy projects can secure financing on an ongoing basis, the federal legal framework should require utilities to enter into long-term PPAs with nonutility power producers that use renewable resources.[307] While many commentators have discussed the benefits and drawbacks of an FIT for the United States, few

*Tariffs*, 20 KAN. J.L. & PUB. POL'Y 329, 343 (2011) (arguing that energy is a regional issue so "state legislators are better positioned to create and pass lasting policies").

[305] *See* Martinot et al., *supra* note 67 (noting that RPS policies do not work where long-term contracts are not available).

[306] *See* Sovacool & Cooper, *supra* note 65, at 89 (advocating a national RPS because the state-based approach dramatically distorts private investment).

[307] *E.g.*, COUTURE ET AL., *supra* note 55, at 72–73.

have focused on the long-term contract as the lynchpin of a successful FIT.[308] Some commentators recommend that the United States adopt an FIT,[309] while others suggest that a European-style FIT, based on a mandated premium price, would not work in the United States for political reasons.[310]

Brazil's experience with both an FIT (PROINFA) and an auction mechanism suggests that the most important aspect of an effective legal framework is providing renewable-energy power producers with long-term contracts at a sufficient fixed price.[311] Locking in the price is crucial because, although the technology itself should get cheaper over time, the bulk of the costs associated with most renewable energy projects are up-front capital costs.[312] The expected return, therefore, is based on the capital costs and the amount of electricity a renewable-energy power producer anticipates it can sell.[313] Brazil's auctions have been successful despite not guaranteeing a premium price.[314] In fact, the competition that the auction mechanism creates has driven prices down, but the assurance of a fixed buyer and price provides the stability investors need to commit.[315]

Ideally, most long-term contracts required under this new framework should be for at least twenty years because that is the lifespan of many renewable energy projects.[316] For certain technologies, however, the optimal contract length may differ.[317] For example, developers of technologies that use a fuel source like biomass may prefer a shorter contract that aligns with their fuel supply contract.[318] The new model should respect these technological differences.[319] Tailoring the framework to the needs of the various

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[308] *E.g.*, Swisher & Porter, *supra* note 55, at 195–97; Jansen, *supra* note 304, at 343 (advocating that states adopt feed-in tariffs); Lynch, *supra* note 275 (advocating for a national FIT).

[309] For examples, see Jansen, *supra* note 304, at 343, who advocated that states adopt feed-in tariffs; Lynch, *supra* note 275, who advocated for a national FIT; and Craig Morris, *Feed-In Tariffs Needed After Grid Parity*, RENEWABLE ENERGY WORLD.COM (Feb. 22, 2011), http://www.renewableenergyworld.com/rea/news/article/2011/02/feed-in-tariffs-needed-after-grid-parity.

[310] Swisher & Porter, *supra* note 55, at 196.

[311] *See* de Vries, *supra* note 234, at 589; *cf.* COUTURE ET AL., *supra* note 55, at v (asserting that FITs are successful in part because they provide long-term purchase agreements at fixed prices).

[312] *E.g.*, Gerrard, *supra* note 17, at 12.

[313] Mallon, *supra* note 246, at 52–54.

[314] *See supra* Part IV.B.

[315] *See supra* note 268 and accompanying text.

[316] Mallon, *supra* note 140, at 23. Wind projects in Brazil generally receive twenty-year contracts. *Dispute Between Ceará and Rio Grande do Norte*, *supra* note 236.

[317] *See* COUTURE ET AL., *supra* note 55, at 73.

[318] *Id.*

[319] *See* Mallon, *supra* note 246, at 45.

technologies would allow developers to get the lowest cost financing possible, resulting in the least price impact on utilities and ratepayers.[320]

Allowing potential renewable energy projects in all states access to long-term PPAs would allow investors to determine whether a project will provide them with a sufficient return and therefore make economic sense. A long-term contract reduces the risk associated with making long-term investment decisions because it isolates the renewable energy project from potential changes to revenue streams, whether market induced or driven by politics.[321] For example, under the current system, an investor runs the risk that a state may reduce its RPS or that a utility's avoided cost may fall during the lifetime of the renewable energy project.[322] If the electricity generated by the renewable energy project is more expensive than that generated from conventional sources of fuel, the power producer without a long-term contract may be forced to accept a price that does not even cover the project's costs, let alone provide a return to investors. The potential for this scenario makes it difficult for nonutility power producers to secure financing and often drives up the cost of the financing that is available.[323]

PURPA caselaw provides precedent for enforcing long-term contracts entered into between utilities and nonutility power producers, regardless of changes that occur in the marketplace. For example, in 1995, in *Freehold Cogeneration Associates v. Board of Regulatory Commissioners*, the Court of Appeals for the Third Circuit held that under PURPA, a state regulator may not modify in any way a previously implemented PPA between a QF and a utility.[324] In that case, the regulator had ordered the QF to renegotiate its contract with the utility after the utility's avoided cost fell well below the price contracted for.[325] The court reasoned that Congress had intended to exempt QFs from state and federal utility rate regulations so the state regulator was preempted from changing the terms of the contract even if it would generally have the authority to do so under its administrative power.[326] Thus, requiring

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320 *See id.* at 53–54.

321 Neuhoff, *supra* note 58, at 314.

322 *See supra* Part II.A and text accompanying notes 179–83.

323 Requiring long-term contracts also has the potential benefit of stabilizing electricity prices in the long run. *See* Sovacool & Cooper, *supra* note 65, at 102. By entering into long-term contracts with renewable-energy power producers, utilities can hedge against volatile fossil fuel prices, stabilizing long-term electricity rates. *Id.*

324 44 F.3d 1178, 1194 (3d Cir. 1995).

325 *Id.* at 1183.

326 *Id.* at 1192.

utilities to enter into long-term contracts with a fixed price would not be inconsistent with current PURPA implementation in those states that require long-term contracts. Yet it would require the federal government to assert more authority by requiring, rather than permitting, long-term contracts in all states.

### *B. Reinforcing the Framework and Minimizing Costs Through a National RPS*

Because there is potential for higher costs associated with renewable energy, utilities should not have to enter into a contract with all nonutility power producers that generate electricity from renewable resources that might request one. Rather, the federal government should adopt a national RPS to ensure utilities enter into long-term contracts for a minimum amount of renewable energy or the corresponding RECs, or generate that minimum amount themselves.[327] This national RPS should set a floor requiring that a minimum percentage of electricity that a utility provides to its consumers be produced using renewable resources. It should also allow individual states to set higher percentages if they desire.[328] Providing a floor but allowing a higher percentage requirement would ensure a nationwide minimum standard, while allowing states with more renewable resources to encourage additional investment.[329] Congress set a similar standard in the Clean Air Act of 1965, allowing California to establish air pollution emission standards for vehicles.[330] By setting a floor in that case, Congress "ensured that the states could continue to innovate while also mandating that all states moved forward in promoting cleaner air."[331]

The RPS under the new framework should set a long-term goal with annual incremental increases to encourage continuous investment.[332] Renewable

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[327] *Cf.* Wilson H. Rickerson et al., *If the Shoe FITs: Using Feed-In Tariffs to Meet U.S. Renewable Electricity Targets*, ELECTRICITY J., May 2007, at 73, 74 ("Although RPS and feed-in tariffs are viewed as mutually exclusive policies in Europe, U.S. policy developments indicate that innovative hybrid approaches are possible in which feed-in tariffs are integrated into or established in tandem with existing renewable targets.").

[328] At least one commentator suggests that post-2004 Congress favors federal ceilings over floors as they prevent state policy makers from "holding the reins of environmental policymaking." Sovacool, *supra* note 169, at 416. While this may be the case in general, establishing a floor would avoid interfering with states that already have higher standards and further encourage investment in renewables. The commentator himself recommends a floor in the case of renewable energy. *Id.* at 472.

[329] *See id.* at 472–73.

[330] Sovacool & Cooper, *supra* note 65, at 141.

[331] *Id.*

[332] *Id.* at 134; *see* Mallon, *supra* note 140, at 23.

energy projects often have a lifetime of about twenty years.[333] If the goal were set for less than twenty years, there would be a "flurry of activity and massive industry growth for the first few years" to meet the cap.[334] "Once capacity meeting the long-term energy cap is in place," new investment in renewable energy projects would likely halt because no new capacity would be needed.[335] Such a scenario would provide little more incentive than the current boom–bust framework to build up a strong domestic manufacturing industry, so the United States would not be able to reap the full benefits of renewable energy development.

To reduce the negative effects of the current system of state RPSs, the law should clearly define the type of renewable resources that would count toward the RPS. This definition should be all-inclusive and allow for technological change.[336] Defining fuel sources that are eligible, rather than specific technologies, could accomplish this goal.[337] Creating a broad definition would also ensure that projects that produce electricity to fulfill the requirements could be developed in all states.[338] This is important because a major concern expressed about adopting a national RPS is that not all states are similarly endowed.[339] Regardless, the RPS should not include any in-state requirements because that tends to drive up the price of compliance.[340]

By establishing a uniform definition of renewable resources and allowing for out-of-state purchases, a national RPS would make compliance easier and more predictable than the current state RPSs. Companies that reside in more than one state would be able to comply by using the renewable energy that makes the most economic sense for the company and ratepayers rather than based on what specific renewable resource counts under each state's RPS.[341] This would reduce compliance costs for utilities.[342] Furthermore, because all renewable resources would count toward the requirement in all states, investors could make decisions based on the economics of the specific project rather

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333 Mallon, *supra* note 140, at 23.

334 *Id.*

335 *Id.*

336 Mallon, *supra* note 246, at 49.

337 Sovacool & Cooper, *supra* note 65, at 135.

338 *Id.* at 147–48.

339 Jim Rossi, *The Limits of a National Renewable Portfolio Standard*, 42 CONN. L. REV. 1425, 1442 (2010); *cf.* Mallon, *supra* note 246, at 49 (asserting that the appropriate mix of technologies varies from country to country).

340 *See supra* notes 175–77 and accompanying text.

341 *See supra* notes 172–74 and accompanying text.

342 Sovacool & Cooper, *supra* note 65, at 94.

than based on those RECs that would have the greatest market potential as may happen now.[343]

Not only could a national RPS reduce compliance costs, but also it would provide investors with more long-term stability than a state RPS because it would reduce the potential for legal challenges.[344] As discussed above, in many states there have been challenges against the RPS, both at the legislative level and by utilities, for constitutional reasons.[345] By implementing a clear mandate with specific permission for the states to adopt more stringent requirements, much of the concern about the stability of the state RPSs would be eliminated, reducing risk for investors.

In addition to mitigating the negative effects of the current state patchwork, adoption of a national RPS would eliminate many of the current pricing issues under PURPA. PURPA prohibits requiring utilities to purchase energy from a QF for a cost that exceeds the avoided cost.[346] PURPA does not prohibit utilities from agreeing to a fixed rate above the utility's avoided cost, but a utility worried about its overall profitability is not likely to agree to a higher rate if not required.[347] Mandating that electric utilities source renewable energy through long-term contracts with nonutility power producers would require utilities to negotiate contracts for a fair price that allows the projects to secure cost-effective financing. At the same time, allowing a utility to invest in its own renewable generation, *if* it can show it is more cost effective for the ratepayers, will limit any unnecessary costs that could arise if utilities did not have that option.

Utilities would be allowed to contract with the power producers of their choosing as long as they meet the minimum requirements. Thus, unlike the FITs that have been implemented in many countries, the recommended framework would maintain a competitive process through which utilities would enter into contracts with those renewable-energy power producers that best meet their needs.[348]

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343 *See supra* note 177 and accompanying text.

344 *See* Sovacool & Cooper, *supra* note 65, at 93 (discussing uncertainty regarding duration of state-based RPSs).

345 *See supra* notes 181–83 and accompanying text.

346 16 U.S.C. § 824a-3(b) (2006).

347 *See supra* notes 77–79 and accompanying text; *cf.* Dewey, *supra* note 99, at 1113 (arguing it is difficult to secure a long-term contract from a utility worried about providing consumers with low rates).

348 *See supra* note 98.

Lastly, to ensure that the new framework provides investors with the maximum amount of stability and accomplishes the goal of increasing renewable energy consumption in the United States, it would be crucial to implement an enforcement mechanism.[349] This mechanism may consist of a national REC trading scheme that allows utilities to track the amount of renewable energy they buy, as well as penalties to be paid by those utilities that do not comply with the requirements.[350]

### *C. Potential Challenges to the Proposed Framework*

Whether the federal government should promote renewable energy and, if so, the design of an appropriate renewable energy policy is the topic of much debate. One central issue regards the economic feasibility of using renewable energy.[351] Politicians are often concerned about raising electricity prices by mandating renewable energy use.[352] Another contention is whether requiring the use of renewable energy should fall on the shoulders of the federal government or the states.[353] Many opponents of a national RPS, for example, believe that state legislatures and agencies are better positioned to make determinations regarding the use of renewable energy within their state's borders.[354]

These debates aside, until now, the federal government has chosen to promote renewable energy, and primarily does so through tax incentives.[355] Furthermore, a majority of the states also promote renewable energy.[356] As this Comment demonstrates, however, the current legal framework to promote renewable energy is not as efficient or cost-effective as it could be. The legal framework this Comment recommends creates long-term predictability for investors and reduces many of the unnecessary costs associated with the current framework, while respecting state and federal boundaries.

The recommended framework would ensure that renewable energy contributes to the current energy matrix in as cost-effective a manner as

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349 *See* Sovacool & Cooper, *supra* note 65, at 139.

350 *Id.* at 138.

351 *E.g.*, Mary Ann Ralls, *Congress Got It Right: There's No Need to Mandate Renewable Portfolio Standards*, 27 ENERGY L.J. 451, 452 (2006).

352 *E.g.*, *id.*; Sovacool & Cooper, *supra* note 65, at 94.

353 *E.g.*, Ralls, *supra* note 351, at 455–56.

354 *E.g.*, *id*.

355 *See supra* Part II.B.

356 *See supra* Part II.C.

possible. Although the prospect of a utility paying above its avoided cost for renewable energy may be concerning, requiring utilities to enter into long-term contracts with nonutility power producers would help drive renewable energy prices down in two respects. First, by reducing investment risk, long-term contracts would drive down the required return on investment and cost of debt for power producers.[357] In turn, renewable-energy power producers should be able to reduce the prices they charge to utilities. Thus, ratepayers would pay a rate closer to the true cost associated with use of renewable resources while reaping all of the benefits they offer, rather than paying more money to investors for assuming risk.

Additionally, the national RPS proposed, rather than a blanket mandate that utilities buy electricity from all renewable energy projects (as some FITs do), should drive down prices by creating competition between renewable-energy power producers. This proposal specifically requires utilities to contract with nonutility power producers unless they can show that investing in their own renewable energy generation is more cost-effective. This requirement will incentivize power producers to continue innovating to generate the lowest cost, yet still reliable, renewable energy possible as they will be competing for contracts. As the wind energy industry has demonstrated in Brazil, this competition should drive the creation of a competitive domestic renewable energy industry with improved technology, lowering capital costs for renewable energy projects.[358]

Under the Federal Power Act, FERC has the power to regulate rates for interstate and wholesale transmission of electricity.[359] In doing so, it can "shape the energy market and affect all stakeholders."[360] As one commentator has described it, "The act creates a 'bright line' between state and federal jurisdiction with wholesale power sales falling on the affirmative federal side of the line."[361] Where the federal government has acted in this sphere, states are prohibited from acting.[362] Wholesale power transactions refer to sales that are made "to any person for resale."[363] Sales by power producers to utilities fit this definition. Thus, FERC has authority over sales by renewable-energy

357 Neuhoff, *supra* note 58, at 314.
358 *See supra* notes 267–70 and accompanying text.
359 *See supra* note 74.
360 Ferrey et al., *supra* note 74, at 180.
361 *Id.*
362 *Id.*
363 *Id.* at 181.

power producers to utilities.[364] The recommended framework does recognize, however, that some states may want to encourage faster development of renewable energy and allows them to adopt a higher requirement to do so.

Different from in Brazil today, under this new legal framework, utilities would be on the hook for supplying a certain amount of electricity generated by renewable resources. As a result the utilities would ensure that the projects they contract with are feasible and the prices not so low that the project could not secure financing. Also, power producers would only get paid for actually providing electricity, so they would be incentivized to maintain their plants.

The recommended legal framework, therefore, would eliminate unnecessary financing costs associated with the current framework to ensure that ratepayers enjoy the benefits of using renewable energy to the full extent possible. By providing nonutility power producers increased access to long-term contracts and stimulating competition that would help drive prices down, the new framework would also reduce the current reliance on tax incentives.

## CONCLUSION

The current legal framework for encouraging investment in renewable energy in the United States is inefficient in that it does not provide investors with the long-term predictability they need and increases the costs of available financing.[365] Rather than creating an environment that fosters continuous investment and the building of a national renewable-energy manufacturing industry, reliance on tax credits and state RPSs has led to a start-and-stop investment climate.[366]

To take advantage of the environmental and economic benefits that renewable energy provides, and to permanently regain its place as global leader in renewable energy investment, the United States must reassert its commitment to renewable energy and revamp its legal framework. This Comment recommends a new legal framework consisting of both a national RPS and a requirement that utilities enter into long-term contracts with nonutility power producers that use renewable resources to meet the RPS requirement, unless they can generate cheaper renewable energy themselves.

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364 *Id.*
365 *See* Swisher & Porter, *supra* note 55, at 185.
366 *See supra* Part II.B–C.

An examination of Brazil's experience over the past decade suggests that long-term contracting can lead to rapid development of renewables.[367] A national RPS would ensure that the contracting requirement is implemented in a cost-effective manner and that the renewable energy industries continue to improve upon current technologies. While additional measures such as tax incentives could serve as complementary elements to send positive signals to investors about the United States' commitment to developing renewable energy, Brazil has demonstrated that a country committed to renewable energy need not have myriad and complicated policies to stimulate investment.[368] Rather, the laws and policies it has in place must be clear and effective.

It is important to keep in mind that the recommended framework deals only with providing efficient incentives to investors. To truly stimulate more rapid, continuous, and efficient renewable energy development, a country such as the United States must complete its assessment of other areas of the law affecting the development and use of renewable energy, including how hospitable an approach it has to matters such as siting, environmental permitting, and transmission grid issues.[369]

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367 *See supra* Part IV.A.

368 *See* Eduardo Magossi, *Brasil tem menos incentivos à energia renovável que EUA e China* [*Brazil Has Fewer Renewable Energy Incentives than the U.S. and China*], ESTADÃO (Sept. 16, 2011), http://economia.estadao.com.br/noticias/negocios+energia,brasil-tem-menos-incentivos-a-energia-renovavel-que-eua-e-china,84491,0.htm.

369 *See, e.g.*, Rossi, *supra* note 339, at 1446–49.

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