

Research Article

Is California's Electricity Policy Really a Model for the United States?

Jude Clemente

Department of Homeland Security, San Diego State University, CA 92182, USA
Address correspondence to Jude Clemente, judeclemente21@msn.com

Received 2 March 2011; Accepted 15 August 2011

Abstract Concerns over rising energy prices, climate change, and energy security have many policymakers and analysts promoting demand-side management (DSM) programs and renewable portfolio standards (RPSs). In recent years, California has been cited as the example for the United States to follow in the national mission to reduce energy consumption and greenhouse gas emissions. California purports to have utilized aggressive DSM and efficiency policies to hold its per capita electricity demand 40% below the national average, and the state stands ready to boost its still unachieved 20% RPS to a Herculean 33% by 2020. The present paper aims to make clear, however, that California's electricity policy is not only unrealistic for the United States but undesirable as well. Continued economic and population growth confirm that the United States' path to clean, reliable, and affordable electricity will need to be different than the one taken by California.

Keywords demand side management; renewable portfolio standard; California public utilities commission; western climate initiative; "Tragedy of the Commons"

1 Introduction

"I believe that together not only can we lead California into the future... we can show the nation and the world how to get there.... We are the modern equivalent of the ancient city states of Athens and Sparta. California has the ideas of Athens and the power of Sparta," then California Governor Arnold Schwarzenegger, 2007 [26].

Higher prices, concerns over climate change, and the essential to enhance energy security are the driving forces behind the push to lower energy demand and more broadly incorporate renewable sources. Political enthusiasm for demand side management (DSM) programs and renewable portfolio standards (RPSs) has grown apace, and policies promoting their deployment continue to gain traction. By the end of 2010, 29 states and the District of Columbia had an RPS to oblige electric companies to produce a specified fraction of their power from renewables. A growing

number of analysts and policymakers praise California as the example to follow in the national mission to reduce energy consumption and greenhouse gas (GHG) emissions. California-based firms led the nation by accounting for nearly 60% of all U.S. venture capital investments in clean energy in 2009 [10], and in recent decades, the state purports to have utilized aggressive DSM and efficiency programs to keep its per capita electricity demand 40% below the national average [42]. For the rest of the United States, the necessity to pursue the "California model" is evidently becoming more clear:

- "California [is] well positioned to lead on climate policy... a laboratory for others to learn from," Daniel Sperling, California Air Resources Board (CARB), 2008 [2].
- "California has been a leader for many years now in renewable energy... setting a role model for the rest of the country and the world," Peter Miller, Natural Resources Defense Council, 2009 [3].
- "In this race for clean technology leadership, California has distinguished itself at the head of the pack... California leads in clean energy policies," Clean Tech, 2010 [11].
- "... California has been the world leader in this area [renewables] for many years. Not only in the U.S. but overseas as well, leaders in the field of renewable energy are keeping their eyes on the state to see what they can learn," Nabil Nasr, Golisano Institute for Sustainability at Rochester Institute of Technology, 2011 [47].

To be sure, however, California does have its fair share of detractors when it comes to deciding the "success" of the state's electricity policies. Much of the criticism centers on higher costs, changes in job structure, and increases in imports. In 2010, for instance, the average retail price of electricity in California for residential customers was about 33% higher than it was for the rest of the country [42]. Overall, California's electricity rates are 45% higher than the U.S. average, and the state's strategy going forward appears to be more "demand destruction" through even higher prices [42]. Weiss and Sarro report that California's

33% RPS by 2020 could increase electricity costs by 28% [44], or 65% higher than the California Public Utilities Commission (CPUC) has claimed [5]. The present analysis aims to augment the mounting body of literature declaring that California's position as the leader in sustainable energy policy is more illusory than real by explaining the three main reasons California's electricity policy is not an example for the nation to follow: (1) the "California model" is not feasible for the United States, (2) California's RPS is not working, and (3) California's electricity imports impact surrounding areas.

2 The "California model" is not feasible for the United States

"...high rates, of course, bear hard on the individual. But from a social standpoint they are chiefly to be regretted because they restrict the use of electricity. Rate schedules should... induce the freest possible use of electricity both in the home and on the farm," Franklin Delano Roosevelt, 1930 [28].

California is decidedly an exceptional state. At less than 20%, Mitchell et al.'s simple linear regression analysis indicated that there is "not a high association" between California's energy efficiency programs and its lower per capita electricity use [24]. There are at least six unique characteristics that suppress the state's need for electricity: (1) residential electricity price, (2) climate, (3) household size, (4) housing mix, (5) conservation ethic, and (6) economy's structure. Stanford University's Energy Efficiency Center further argues that efficiency policies account for just "23% of the overall difference" between California's per capita electricity consumption and that of the rest of the country [32]. In addition to the unique factors put forth by Mitchell's group, the researchers conclude that urbanization, housing unit floor space, and household fuel mix all make the "California model" inapplicable to other states.

Of particular interest is the fact that the above regression results directly contradict The World Bank's claim that California's flat per capita electricity demand is "thanks largely to utility demand-side management and efficiency standards" [36]. As suggested earlier, a primary reason Californians use less electricity than other Americans is obvious: prices in the state are typically far above the national average. According to the U.S. Energy Information Administration (EIA), California's electricity prices have risen much faster than those of other states—from 1970 to 2007, the retail price of residential power in California jumped by 35% more than it did for the rest of the country [42]. Rising prices have inspired the "conservation ethic" that has helped stabilize the state's per capita use. Californians are much more likely to practice energy saving habits than other Americans.

Following the "California model," however, is not only unrealistic for the United States, but the path would be detrimental to national interest. California's concerted effort against energy-intensive goods and services has had a destructive effect on the state's economy: California lost 34% of its manufacturing base from 2001 to 2010 [25]. Higher energy prices dangerously put domestic firms at a global competitive disadvantage by increasing the cost of doing business. The Milken Institute reports that businesses in California pay 23% more than the national average just to operate [22]. California recently beat out only New Jersey as the "least business friendly" state in the Small Business & Entrepreneurship Council's annual rankings [27], and Chief Executive Magazine designated California as the nation's "worst business climate" every year from 2006 to 2009 [9].

California's auditing agency, its own version of the Congressional Budget Office, concludes that the state's 2006 Global Warming Solutions Act, which requires new regulations to reduce GHG emissions to 1990 levels by 2020, will cause "the prices of goods and services to rise; lowering business profits; and reducing production, income and jobs" [35]. The CPUC concludes that California's clean electricity target could increase rates by 5% to 6.5% above current baseline projections [6]. Moreover, California's relatively flat per capita electricity consumption is not the equivalent of reduced consumption and/or GHG emissions. The state's total power demand and corresponding carbon dioxide (CO₂) emissions have soared by 25% and 20% respectively since 1990 [15]. Contrary to California's contention, Sweeney finds that the state's early-2000s electricity crisis "was not the result of deregulation, but rather of overly stringent regulation" which led to "very little" new generating capacity being added [31]. The University of Texas' Center for Energy Economics also reports that California had "maintained one of the strictest sets of environmental regulations and opposition... to power plants... discouraged investment in new capacity" [8].

This historical pattern of underinvestment in generation capacity paved the way toward \$40 billion in extra energy costs for Californians from 2001 to 2003, or nearly 4% of the state's total annual economic output [43]. Looking forward, the United States surely demands an electricity generation growth strategy. The Electric Power Research Institute reports that domestic consumption will increase 16% to 20% from 2010 to 2030 even under "ideal" DSM and efficiency programs [13]. Over the next 20 years, the EIA expects the United States to add more than two Japans to its Gross Domestic Product (\$8.7 trillion) and expand its population by the size of France (65 million people) [16]. Indeed, installing the "California model" would have the United States painfully experiencing the veracity of the words of Jack Gerald, the former president of the National Mining Association, who once warned that

“the most expensive kilowatt is the one that’s not there when needed” [29].

3 California’s RPS is not working

Established in 2002, accelerated in 2006, and increased in 2010, California has the second highest RPS in the United States, after Maine. The original target required investor-owned utilities (IOUs), electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources by at least 1% of their retail sales annually, until they reached 20% by 2010. In September 2010, CARB approved a rule as directed by then Governor Schwarzenegger’s 2009 Executive Order to advance the state’s RPS to 33% by 2020. Legislation by California Senator Joe Simitian, which passed the state Senate in February 2011 and has moved on to the Assembly, would make the new target a law and extend to public utilities like the Los Angeles Department of Water & Power, the nation’s largest municipal utility, which was not covered under the 20% mandate. California’s three major IOUs, together serving three quarters of the state’s population, were all out of RPS compliance by the end of 2010. According to the CPUC [7], about 15% of their collective retail electricity sales came from renewables:

- San Diego Gas & Electric—10.5%.
- Pacific Gas & Electric—14.4%.
- Southern California Edison—17.4%.

Greg Morris, Director of the Green Power Institute and a leading advisor on the development and analysis of renewable energy policy, disagrees with the “often advertised” claim that California’s three large IOUs will achieve the 20% RPS within just a few years: “I see very little reason to feel like we’re actually going to do that” [12]. Despite an onslaught of grants, subsidies, tax-credits, and cash-incentives to promote its use, renewable energy is losing market share and has “actually fallen behind every single year since the program [RPS] went into effect,” he adds [12]. While the procurement side is progressing, actual project development has been hampered by a slew of regulations and requirements, a transmission shortfall, and multiple agencies with overlapping or unclear jurisdiction. “We’ve done a great job of signing contracts. We’ve done a very poor job of actually bringing power online,” Morris admits [12].

Simply put, California’s RPS is not working. According to the Union of Concerned Scientists [37], the underlying goal of California’s RPS “is to drive the development of new renewable energy facilities and displace the need to generate in-state electricity from fossil fuels.” Wind and solar power, however, cannot supplant other generation because their intermittency requires that they are paired with another power plant or some energy storage device to add capacity to

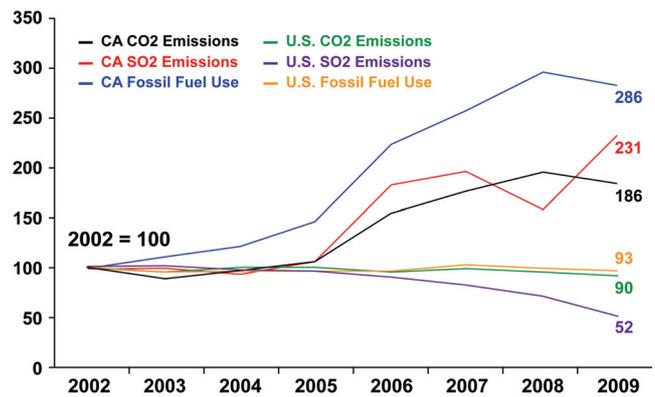


Figure 1: Growth index of fossil fuel use and emissions by utilities (2002–2009). Source: developed from Energy Information Administration, U.S. Department of Energy, “Electric Power Annual 2009—State Data Tables,” 2010, [15].

the grid. This “spinning reserve” is predominantly provided by natural gas (a fossil fuel) and hydro plants because of their capacity to be ramped up quickly and sustained for longer periods. Due to heightening environmental and social concerns, many environmental groups now want hydropower excluded from renewable initiatives altogether even though it provides over half of California’s renewable energy generation. In fact, large hydro facilities (over 30 megawatts) do not qualify as renewable under California’s RPS. Thus, natural gas, although it is a fossil fuel, is quickly becoming the default choice to back-up wind and solar power. In 2002, natural gas generated 12% of the electricity in California’s utility industry; in 2009, it generated 30% [15]. These companies tripled their total gas consumption over that time.

Beyond the compliance lapse, from 2002 to 2009, California’s utilities, the industry covered under the RPS, generated more electricity, consumed more fossil fuels, and emitted more GHG and Criteria Air Pollutants than other U.S. utilities on a percentage increase basis (see Figure 1). And California’s utility industry increased generation of all sources by 14%, while that of the rest of the U.S. decreased generation by 7% [15]. Importantly, population and economic growth are not at fault. Gross State Product for California and the rest of the country each grew by roughly 36% during the period [4], while their populations both expanded by around 6% [39]. Rising sulfur dioxide (SO₂) emissions for California’s utilities is an unfortunate reversal of fortune because companies had slashed these releases from 1990 to 2001. In addition, the U.S. utility industry sliced nitrogen oxides emissions by more than half from 2002 to 2009, while they increased by 34% in California’s utility industry [15].

4 California's electricity imports impact surrounding areas

“California is not an electrical island. . . . California needs to share the responsibility of building more generation plans, electrical transmission facilities and gas pipelines, and deal with the inherent environmental challenges that presents,” Bill Owens, Governor of Colorado [34].

The idea that electricity policies in California can adversely impact surrounding areas is not new. The University of Pennsylvania reports that California's early-2000s electricity crisis, where state policies leading to a lack of generating capacity was a determining factor, “spread well beyond California's borders, forcing the closing of aluminum plants in the Pacific Northwest and saddling ratepayers in Utah and Washington states with rate hikes of up to 88%” [38]. Data gathered from the EIA [42] indicate that California imports more electricity than any other state (often 30% of total load), and capacity shortages have made the state more dependent on outside producers. California does export some electricity in the colder winter months to Oregon and Washington, but wind power, the energy source that will continue to dominate RPS-motivated capacity additions, is strictly a one-sided relationship. California buys the Northwest's wind, but not the reverse.

With a Herculean 33% RPS by 2020 set to become law, California wants to lean on its neighbors for even more renewable power. As proposed by then Governor Schwarzenegger in 2009 [18]: “Why can we get the water from the Colorado River but we cannot get renewable energy from outside the state? We get most of our cars from outside the state; why cannot we get renewable energy?” Despite transmission bottlenecks and loud complaints about out-of-state facilities not creating local jobs, California's 33% RPS “opens the door to more clean power imported from other states” [30]. Competition for renewables in the entire western region, however, is rapidly on the rise, as the Western Climate Initiative (WCI), has “achieved consensus on a regional strategy to reduce greenhouse gas emissions that accommodates the diversity of its 11 Partner jurisdictions” [45].

The focus is certain to remain on wind power, an energy source that constituted an overwhelming 94% of the RPS-motivated capacity additions from 1998 to 2009 [23]. Assuming wind energy provides 80% of the incremental RPS capacity additions until 2025, Figure 2 illustrates the substantial growth required to meet the various RPSs of California's WCI neighbors, as determined by the Lawrence Berkeley National Laboratory, a U.S. Department of Energy Office of Science national lab. The WCI members will be hard pressed to meet their own clean electricity targets, which could soon be further advanced like California's

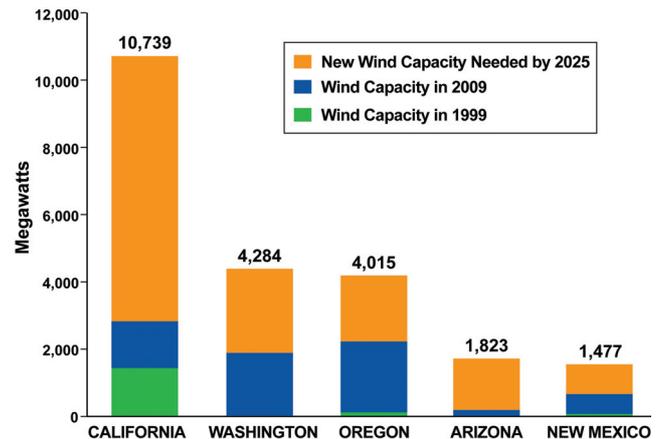


Figure 2: The West's required wind capacity additions by 2025. * assuming 80% of new RPS-motivated capacity additions comes from wind power. Source: developed from Lawrence Berkeley National Laboratory, U.S. Department of Energy, 2010 [23] and Wind Powering America, U.S. Department of Energy, 2010 [46].

was (e.g., Colorado), and their scour for renewables seems destined to clash with California's aggressive 33% RPS by 2020 [14]:

- Washington—15% by 2020.
- New Mexico—20% by 2020.
- Arizona—15% by 2025.
- Utah—20% by 2025 (non-binding).
- Oregon—25% by 2025.

Increased competition from a rival of California's size is a serious concern for other western states. California consumes about 45% more electricity than New Mexico, Utah, and Oregon do combined, or nearly double the amount consumed in Arizona or Washington [42]. As California's insatiable appetite for renewable energy escalates, home-turf purchases for its neighbors will become more difficult and expensive. “They're [California] certainly trying to grab it [renewable power] everywhere they can. The issue is cost. California can pay more,” declares Lee Beyer, chairman of the Oregon Public Utility Commission [20]. At the macro-level, California has 38 million people and the seventh largest economy in the world. The state's Gross Product is almost twice as much as those of the above group combined [4]. California also has a greater capacity to buffer higher energy prices at the individual level. According to the U.S. Census Bureau [40], California has the 9th highest annual per capita income rate in the nation (\$44,000), compared to Washington (13th), New Mexico (43rd), Arizona (41st), Utah (48th), and Oregon (32nd). Concern over the impact of higher electricity prices has some WCI members withdrawing from the cap and trade scheme that is set to begin in 2012.

California's renewable energy quest "is really going to be felt from the tip of northern British Columbia down to Mexico and all across the West," says Steve Ernst, editor of the Northwest energy-policy newsletter Clearing Up [19]. In turn, "We do believe the [California RPS] law will increase competition for renewable energy credits in the Northwest and will likely translate into higher cost for green power. . . . Our biggest concern. . . is. . . cost for our ratepayers," claims Chris Robinson, power manager for Tacoma Power in Washington [19]. Robinson notes that even California's renewable energy credits program could harm western utilities in the short-term by creating an oversupply of cheaper renewable energy, thus hindering their ability to sell surplus supply on the open market. British Columbia, a key supplier of California's hydropower, also confronts its own electricity issues. Surging domestic demand made the Canadian province a net power importer for every year but one during the 2000s [33].

Indeed, California's relentless pursuit of clean electricity throughout the entire western North America region is renewable energy's version of Hardin's "Tragedy of the Commons," where individuals acting independently in their own self-interest can erode the availability of shared resources. This collective action problem that is arising from California's deepening reliance on imports helps explain why two leading U.S. authorities on electricity, Jay Apt (Carnegie Mellon University) and Robert Michaels (California State University, Fullerton), have spoken out publicly against a proposed federal RPS, known as a Renewable Energy Standard.¹ As more states are forced to implement renewables into their generation portfolios, their capacity to export clean electricity will continually wane and renewable protectionism emerges as a greater threat. The 2010 Census [41] confirmed that the four fastest growing states since 2000 are all in the West: Nevada (35%), Arizona (25%), Utah (24%), and Idaho (21%). By comparison, the United States as a nation grew by just over 9% [41].

5 Conclusion

The U.S. path toward clean, reliable, and affordable electricity will need to be different than the one taken by California. DSM and energy efficiency programs are only moderately responsible for California's lower per capita electricity usage, and other states are incapable of duplicating the unique characteristics that define "The Golden State." Renewable energy has been expensively slow to penetrate California's electricity portfolio, and more imports will continue to unfairly impact California's less well-off and growing neighbors. The opposition to liquefied natural gas import projects illustrates that California is even willing to limit

the availability of its primary source of electricity and the favored source of the "spinning reserve" required for intermittent renewables. Carnegie Mellon University's Electricity Industry Center warns that such short-sighted positions "might doom renewable energy. . . and. . . result in high cost, disputes over land use, and unreliable electricity, leading to a public backlash" [1].

Although Californians use less electricity than other Americans, the state has by no means achieved the absolute reductions in demand and GHG emissions needed to mitigate climate change. To that end, those claiming that overly ambitious RPS targets will hasten the reduced need for conventional energy production are ignoring the cold hard reality: the International Energy Agency's latest "450 Scenario," which (optimistically) assumes that "policy action is taken to limit the long-term concentration of greenhouse gases in the atmosphere to 450 parts per million of CO₂-equivalent," projects mainstream generation technologies (fossil fuels and nuclear energy) will still constitute over 70% of U.S. electricity production in 2030 [21]. Environment California finds that California itself will spend almost \$3 trillion on fossil fuels from now until that time [17].

References

- [1] J. Apt, L. Lave, and S. Pattanariyankool, *A national renewable portfolio standard? Not practical*, Fall 2008. Electricity Industry Center, Carnegie Mellon University. Issues in Science and Technology. Retrieved from <http://www.issues.org/25.1/apt.html>.
- [2] Baker Institute Policy Report, *Sustainable U.S. Policy Options to Address Climate Change: Highlights of the Debate*, Tech. Report no. 41, James A. Baker III Institute for Public Policy of Rice University, Houston, TX, June 2009. Retrieved from http://www.rice.edu/energy/publications/PolicyReports/study_41.pdf.
- [3] M. Berger, *Climate change: Copenhagen fizzled, California forges ahead*, December 2009. Global Issues, retrieved from <http://www.globalissues.org/news/2009/12/21/3999>.
- [4] Bureau of Economic Analysis, *Gross domestic product by state (GDP by state) interactive map*, 2011. U.S. Department of Commerce. Retrieved from <http://www.bea.gov/regional/gdpmap/>.
- [5] California Public Utilities Commission, *33% renewable portfolio standard implementation analysis: preliminary results*, tech. report, Sacramento, CA, 2009. <http://www.cpuc.ca.gov/NR/rdonlyres/1865C207-FEB5-43CF-99EB-A212B78467F6/0/33PercentRPSImplementationAnalysisInterimReport.pdf>.
- [6] California Public Utilities Commission, *RPS Implementation Report*. Sacramento, CA, June 2009.
- [7] California Public Utilities Commission, *California renewables portfolio standard (RPS)*, tech. report, January 2011. Office of Governor Jerry Brown. Retrieved from <http://www.cpuc.ca.gov/PUC/energy/Renewables/>.
- [8] Center for Energy Economics, *Electricity restructuring in California*. University of Texas, www.beg.utexas.edu/energyecon/new-era/case_studies/electricity_restructuring_in_california.pdf.
- [9] ChiefExecutive.net, *CEOs select best, worst states for job growth and business*, March 2009. Chief Executive Magazine. Retrieved from <http://chiefexecutive.net/ceos-select-best-worst-states-for-job-growth-and-business>.
- [10] Clean Edge, *California, Oregon, and Massachusetts lead list of top 10 clean-energy states*, December 2010. Retrieved from <http://www.cleandedge.com/about/pr/CELI2010v%20Final.pdf>.

¹ See Testimony of Dr. Jay Apt and Dr. Robert Michaels. (April 23, 2009). U.S. House of Representatives Committee on Energy and Commerce Subcommittee on Energy and Environment. Hearing on The American Clean Energy Security Act of 2009.

- [11] Clean Tech, *California leads nation in clean energy policies, captures 40% of clean technology venture investments since 2006*, 2010. <http://www.epicos.com/Portal/Main/Home/Pages/ItemDetails.aspx?wlaopCxX2Y%2BLg6gQfbq7B%2FLXb%2-F2JNI%2BgfU%2FEonDLtdz1mTvpIzUqTQ%3D%3D>.
- [12] S. Doggett, *Percentage of renewable energy from Calif. utilities decreases; red tape blamed*, January 2010. Edmunds Auto-Observer, <http://blogs.edmunds.com/greencaradvisor/2010/01/percentage-of-renewable-energy-from-calif-utilities-decreases-red-tape-blamed.html>.
- [13] Electric Power Research Institute, *Assessment of achievable potential from energy efficiency and demand response programs in the U.S. (2010–2030). Executive summary*, January 2009. The Edison Foundation, <http://www.edisonfoundation.net/iee/reports/EPRI.SummaryAssessmentAchievableEEPotential0109.pdf>.
- [14] Energy Efficiency & Renewable Energy, *States with renewable portfolio standards*, June 2009. U.S. Department of Energy. Retrieved from http://apps1.eere.energy.gov/states/maps/renewable_portfolio_states.cfm.
- [15] Energy Information Administration, *Electric power annual 2009 – State data tables*, November 2010. U.S. Department of Energy. Retrieved from http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html.
- [16] Energy Information Administration, *International energy outlook 2010*, Tech. Report DOE/EIA-0484(2010), U.S. Department of Energy, Washington, DC, July 2010. Retrieved from <http://www.eia.gov/oiaf/archive/ieo10/index.html>.
- [17] Environment California, *Energy program news*, 2009. Retrieved from <http://www.environmentcalifornia.org/newsroom/energy/energy-program-news/dependence-on-big-oil-dirty-coal-could-cost-california-2911-billion-by-2030-groups-call-on-congress-to-repower-america-with-clean-energy-for-consumers-and-environment>.
- [18] K. Galbraith, *Debating protectionism on renewable energy*, 2009. The New York Times, <http://green.blogs.nytimes.com/2009/09/16/debating-protectionism-on-renewable-energy/>.
- [19] A. Garber, *California's appetite for green power could boost rates here*, 2009. The Seattle Times, http://seattletimes.nwsourc.com/html/politics/2009902849_greenpower20m.html.
- [20] J. Holman, *Power-hungry California is hot for the Northwest's clean energy*, August 2008. Oregon Live. Retrieved from http://www.oregonlive.com/environment/index.ssf/2008/08/california_utilities_look_to_o.html.
- [21] International Energy Agency, *World Energy Outlook 2010*, 2011. Paris, France, <http://www.iea.org/weo/2010.asp>.
- [22] K. Janousek, *Cost of doing business in California*, August 2010. The California Association of Business, Property and Resource Owners. Retrieved from <http://cabproreport.typepad.com/weblog/2010/08/cost-of-doing-business-in-california.html>.
- [23] Lawrence Berkeley National Laboratory, *State of the states: update on RPS policies and progress*, 2010. U.S. Department of Energy, http://www.renewableenergymarkets.com/docs/presentations/2010/Wed_State%20of%20the%20Markets_Ryan%20Wiser.pdf.
- [24] C. Mitchell, R. Deumling, and G. Court, *Stabilizing California's demand: the real reasons behind the state's energy savings*, Public Utilities Fortnightly, 147 (2009), 50–62.
- [25] J. Norman, *Calif. businesses urge regulatory reform*, April 2010. The Orange County Register, <http://jan.ocregister.com/2010/04/16/calif-businesses-urge-regulatory-reform/35347/>.
- [26] Pew Charitable Trusts, *California State of the State Address 2007*, 2007. State of the State Speech, <http://www.stateline.org/live/printable/speech?contentId=169992>.
- [27] Reason Foundation, *Can California cut back on greenhouse gases?*, 2009. Opposing Views, <http://www.opposingviews.com/i/can-california-cut-back-on-greenhouse-gases>.
- [28] F. Roosevelt, *The governor states the power issue*, January 1930. The New York Times. Retrieved from Proquest Historical Newspapers (1851–2007) from Penn State University's Pattee Library.
- [29] M. Schulz, *California's Potemkin environmentalism*, City Journal, 18 (Spring 2008).
- [30] C. Sullivan, *Calif. raises renewable portfolio standard 33%*, September 2010. The New York Times, www.nytimes.com/gwire/2010/09/24/24greenwire-calif-raises-renewable-portfolio-standard-to-3-24989.html.
- [31] J. Sweeney, *The California Electricity Crisis*, Hoover Institution Press Publication, Stanford, CA, 2002.
- [32] J. Sweeney and A. Sudarshan, *Deconstructing the "Rosenfeld curve"*, 2008. Precourt Energy Efficiency Center, Stanford University, http://piee.stanford.edu/cgi-bin/htm/Modeling/research/Deconstructing_the_Rosenfeld_Curve.php.
- [33] The Castlegar Source, *Is B.C. running out of electricity*, July 2010. Retrieved from <http://castlegarsource.com/node/6563>.
- [34] The Denver Post, *Owens rips Calif. Power plan*, January 2001. A.04.
- [35] The Wall Street Journal, *"Cap and Flee." California refutes its own 'green jobs' policy*, 2010. <http://online.wsj.com/article/SB10001424052748703559004575256981030653158.html>.
- [36] The World Bank, *Development and climate change*, tech. report, The World Bank, Washington, DC, 2010, p. 215.
- [37] Union of Concerned Scientists, *California legislature to reconsider renewable electricity standard*, 2010. http://www.ucsusa.org/news/press_release/california-renewable-electricity-standard-0409.html.
- [38] University of Pennsylvania, *Abuse of power: how manipulative trading undermined energy deregulation*, June 2002. Knowledge@Wharton. Retrieved from <http://www.upenn.edu/researchatpenn/article.php?46&bus>.
- [39] U.S. Census Bureau, *Population estimates*, 2010. Retrieved from <http://www.census.gov/popest/estimates.html>.
- [40] U.S. Census Bureau, *The 2011 statistical abstract: state rankings*, 2011. Retrieved from <http://www.census.gov/compendia/statab/rankings.html>.
- [41] U.S. Census Bureau, *United States Census 2010*, 2011. Retrieved from <http://2010.census.gov/2010census/>.
- [42] U.S. Energy Information Administration, *Electricity*, 2011. U.S. Department of Energy. Retrieved from <http://www.eia.doe.gov/electricity/data.cfm>.
- [43] C. Wear, *The California electricity crisis: causes and policy options*, January 2003. California Institute of Public Policy, <http://www.pplic.org/main/publication.asp?i=374>.
- [44] J. Weiss and M. Sarro, *The economic impact of AB 32 on small business*, December 2009. The Brattle Group. Retrieved from http://www.ucsusa.org/assets/documents/global_warming/AB-32-and-CA-small-business-report.pdf.
- [45] Western Climate Initiative, *WCI brochure*, 2010. Retrieved from <http://www.westernclimateinitiative.org/component/remository/general/WCI-Brochure-%28May-2010%29/>.
- [46] Wind Powering America, *U.S. installed wind capacity and wind project locations*, 2010. U.S. Department of Energy, www.windpoweringamerica.gov/wind_installed_capacity.asp.
- [47] D. Wood, *Jerry Brown's tough choice: green energy in hard economic times*, 2011. The Christian Science Monitor, <http://www.csmonitor.com/USA/Politics/2011/0224/jerry-brown-s-tough-choice-green-energy-in-hard-economic-times>.