

AN ENVIRONMENTAL ARGUMENT FOR A CONSISTENT FEDERAL POLICY ON MARIJUANA

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The federal government has dealt with the increasing trend towards states legalizing marijuana for medicinal and recreational use in conflicting ways. While marijuana remains illegal at the federal level, recent general federal policy has discouraged intervention in state legalization. This approach has resulted in conflicting federal policies and created uncertainty for state-legal marijuana growers and sellers. This Note explores the environmental consequences of state and federal policies on marijuana, particularly water and energy resources, and argues that the development of a consistent and reliable federal policy towards marijuana would help to minimize its negative environmental impacts.

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INTRODUCTION

Since 1996, 23 states and the District of Columbia have legalized medical marijuana.¹ Colorado and Washington were the first two states to legalize the recreational use of marijuana in 2012, and Alaska, Oregon, and Washington D.C.² followed suit in 2014.³ At least five more states are likely to put recreational legalization on the ballot in 2016: California, Massachusetts, Maine, Nevada, and

1. I use the term “marijuana” throughout this Note, although the terms marijuana and cannabis are commonly used interchangeably. *Cannabis* refers specifically to the plant genus, which comprises *cannabis sativa*, the scientific name for marijuana, and by some classifications, also includes the species *C. indica* and *C. ruderalis*. See *Marijuana*, ENCYCLOPAEDIA BRITANNICA ONLINE, <http://www.britannica.com/EBchecked/topic/365182/marijuana> (last visited Oct. 14, 2015); See also Matthew L. Schwartz, *Legal Marijuana Dealers—and the Government—Need Bankers and Lawyers*, FORBES, (June 1, 2015, 7:21 AM), <http://www.forbes.com/sites/danielfisher/2015/06/01/legal-marijuana-dealers-and-the-government-need-bankers-and-lawyers/>.

2. In December 2014, Congress addressed D.C.’s legalization of marijuana by passing § 809 of the Consolidated and Continuing Further Appropriations Act, 2015, which prohibits any appropriated federal funds from being used to implement any law, rule, or regulation to legalize marijuana or to reduce penalties for the possession, use, or distribution of marijuana. Consolidated and Continuing Further Appropriations Act, Pub. L. No. 113-235 § 809 (2015). While D.C. Mayor Muriel Browser allowed marijuana legalization to take effect on February 26, 2015, the city is effectively barred from setting up any mechanism to tax and regulate marijuana. William Cummings, *Pot Now Legal in D.C. Despite Threats from Congress*, USA TODAY (Feb. 26, 2015), <http://www.usatoday.com/story/news/nation/2015/02/25/dc-marijuana-legalization/24033803/>; see also C.J. Ciaramella, *Angry Weed Activists Demand Congress Stop Trying to Block DC Legalization*, VICE (Mar. 18, 2015), <http://www.vice.com/read/weed-activists-want-congress-to-give-up-fight-against-dc-legalization-318>.

3. Dan Merica, *Oregon, Alaska and Washington, D.C. Legalize Marijuana*, CNN POLITICS (Nov. 5, 2014), <http://www.cnn.com/2014/11/04/politics/marijuana-2014/index.html>.

Arizona.⁴ In total, 37 states and the District of Columbia have liberalized their marijuana laws in some way.⁵ Seventy-six percent of the U.S. population now lives under liberalized state marijuana laws.⁶

This rising trend reflects a dramatic shift in public attitudes towards marijuana. In 1969, only 12% of Americans were in favor of legalizing the use of marijuana—but today, between 51% and 61% of Americans support its legalization.⁷ Despite these numbers, the Controlled Substance Act (“CSA”), passed by Congress in 1970, lists marijuana as a Schedule I controlled substance and explicitly makes it a felony to manufacture, distribute, dispense, or possess marijuana.⁸

Much has been written about the social consequences of criminalizing marijuana, particularly on its disparate impacts on minorities.⁹ The impacts of

4. *Id.*; see also Katy Steinmeitz, *These Five States Could Legalize Marijuana in 2016*, TIME (Mar. 17, 2015), <http://time.com/3748075/marijuana-legalization-2016/>. But see Daniel Roberts, *These Could Be The Next States to Legalize Marijuana*, FORTUNE (Aug. 19, 2015), <http://fortune.com/2015/08/19/marijuana-legal-next-11-states/> (stating that the following 11 states where medical marijuana is legal and possession of a small amount of marijuana does not carry a prison sentence are the most likely to next legalize marijuana for recreational use: California, Connecticut, Delaware, Maine, Maryland, Massachusetts, Minnesota, Nevada, New York, Rhode Island, and Vermont); see also Aaron Smith, *Ohio to Vote on Marijuana Legalization*, CNN MONEY (Aug. 13, 2015), <http://money.cnn.com/2015/08/13/news/ohio-marijuana/> (stating that Ohio could be the next state to legalize recreational marijuana on its November 3, 2015 ballot).

5. David Firestone, *Let States Decide on Marijuana*, N.Y. TIMES OP. PAGES (July 26, 2014), <http://www.nytimes.com/2014/07/27/opinion/sunday/high-time-let-states-decide-on-marijuana.html?op-nav>; *Marijuana Legalization and Decriminalization Overview*, FINDLAW, <http://criminal.findlaw.com/criminal-charges/marijuana-legalization-and-decriminalization-overview.html> (last visited Apr. 22, 2015). “Liberalization” includes not only state laws that legalize medical and recreational marijuana, but also laws that decriminalize marijuana by not prosecuting individuals caught with small amounts of marijuana.

6. Firestone, *supra* note 5.

7. Lydia Saad, *Majority Continues to Support Pot Legalization in U.S.*, GALLUP (Nov. 6, 2014), <http://www.gallup.com/poll/179195/majority-continues-support-pot-legalization.aspx> (finding that 51% of Americans support legalizing the use of marijuana); SKDKNICKERBOCKER & BENENSON STRATEGY GRP., *Marijuana*, <http://beltway.bsgco.com/content/marijuana> (last visited Apr. 22, 2015) [hereinafter SKDKNICKERBOCKER & BENENSON] (finding that 61% of Americans believe that state-regulated sales of marijuana should be legal across the country).

8. 21 U.S.C. §§ 801–971 (2012).

9. See Mitch Earleywine & Mallory Loflin, *Curious Consequences of Cannabis Prohibition*, 6 ALB. GOV’T L. REV. 438 (2013); Paul Butler, *(Color) Blind Faith: The Tragedy of “Race, Crime and the Law,”* 111 HARV. L. REV. 1270, 1275 (1998) (book review); Harry G. Levine et al., *Targeting Blacks for Marijuana*, DRUG POLICY ALL. 6 (2010), http://www.drugpolicy.org/docUploads/Targeting_Blacks_for_Marijuana_06_29_10.pdf; Harry G. Levine & Deborah Peterson Small, *Marijuana Arrest Crusade: Racial Bias and Police Policy in New York City 1997-2007*, N.Y. CIVIL LIBERTIES UNION 6 (2008), http://www.nyclu.org/files/MARIJUANA-ARREST-CRUSADE_Final.pdf. See generally

inconsistent government regulations on capital investment in marijuana have also been discussed.¹⁰ Additionally, the environmental impacts of cultivating illegal marijuana on public and private lands have been explored.¹¹ Because the state-legal marijuana industry is so new, however, the current and potential environmental impacts of inconsistent federal policy on states' legalization of marijuana, and recommendations to minimize those impacts, have not been explored. This Note seeks to address some of the gaps in this area.

This Note first explores the impact of marijuana cultivation on water and energy resources, and how current federal policy helps shape that impact. It then argues that the federal government should not only develop comprehensive and consistent federal policies towards state legalization of marijuana, but it should do so in a way that addresses and minimizes environmental impacts of marijuana production through regulation. The current policies adopted by the government towards marijuana are inconsistent, create uncertainty among “good actors,”¹² and exacerbate environmental impacts.¹³ At the same time, the trend toward state legalization will almost certainly continue. Regardless of whether decriminalizing marijuana is a wise policy, the federal government has already taken steps in that direction by acquiescing to state legalization and decriminalization of marijuana.¹⁴

Although it is possible that a future administration could reverse the policies put in place under President Barack Obama's Administration, which have permitted states to legalize marijuana under limited circumstances, it is very unlikely. First, legalization and decriminalization have led to large economic benefits at the state and local level, and have the potential to create large economic benefits at the federal level as well.¹⁵ Second, society's perception of marijuana

MICHELLE ALEXANDER, *THE NEW JIM CROW: MASS INCARCERATION IN THE AGE OF COLORBLINDNESS* (2013).

10. See Adrian A. Ohmer, Note, *Investing in Cannabis: Inconsistent Government Regulation and Constraints on Capital*, 3 MICH. J. PRIV. EQUITY & VENTURE CAP. L. 97 (2013).

11. See Warren Eth, *Up in Smoke: Wholesale Marijuana Cultivation Within the National Parks and Forests, and the Accompanying Extensive Environmental Damage*, 16 PENN. ST. ENVTL. L. REV. 451 (2008).

12. In this Note, “good actors” refers to producers, sellers, and users who desire regulation of the state-legal marijuana industry and who play by the rules to be legal and legitimate in the eyes of the state.

13. See Todd Grabarsky, *Conflicting Federal and State Medical Marijuana Policies: A Threat to Cooperative Federalism*, 116 W. VA. L. REV. 1, 25 (2013) (“The federal executive policy [on medical marijuana] can be characterized as spottily inconsistent at best and whimsical at worst.”).

14. See Karen O’Keefe, *State Medical Implementation and Federal Policy*, 16 J. HEALTH CARE L. & POL’Y 39, 51 (2013) (describing Deputy Attorney Ogden’s 2009 memo, which states that law enforcement efforts should “not focus federal resources . . . on individuals whose actions are in clear and unambiguous compliance with existing state laws providing for the medical use of marijuana.”); see also discussion *infra* Part V.

15. JEFFREY A. MIRON, *THE BUDGETARY IMPLICATIONS OF MARIJUANA PROHIBITION* (2005) (finding that legalizing marijuana would save \$7.7 billion per year in government expenditures with \$5.3 billion accruing to state and local government and \$2.4 billion accruing to the federal government), http://www.cannabis-commerce.com/library/Miron_Report_2005.pdf; see also Christopher Ingraham, *Colorado’s*

has shifted in recent decades so that a majority of Americans now support legalization.¹⁶ Lastly, the most serious fears or doubts about the dangers of legalizing marijuana have not come to fruition.¹⁷ Therefore, moving forward, federal policy must deal with this new reality in a comprehensive and reliable way.

The key question now facing federal lawmakers and administration officials is how to harmonize federal law with state reforms.¹⁸ One area where a comprehensive federal policy should focus is on the environmental impacts of marijuana cultivation, by promoting the most beneficial and efficient uses of water and energy and minimizing negative impacts. Marijuana cultivation can and does wreak havoc on the environment when practiced in certain ways.¹⁹ Some illegal growers divert water from streams and rivers critical to endangered species' habitat; they clear-cut forests; and they leave fertilizers and dangerous chemicals on the land that leach into the soil and nearby streams.²⁰ Other illegal growers convert homes into camouflaged indoor grow houses, which can use an enormous amount of electricity for lighting and ventilation compared to other forms of marijuana cultivation.²¹ Conflicting state and federal policies often exacerbate the causes of these negative environmental impacts by making it possible for unregulated marijuana cultivation to thrive.²²

Legal Weed Market: \$700 Million in Sales Last Year, \$1 Billion by 2016, WASH. POST. (Feb. 12, 2015), <http://www.washingtonpost.com/news/wonkblog/wp/2015/02/12/colorados-legal-weed-market-700-million-in-sales-last-year-1-billion-by-2016/>. *But see* Marian Shanahan & Alison Ritter, *Cost Benefit Analysis of Two Policy Options for Cannabis: Status Quo and Legalization*, 9 PLOS ONE 4 (Apr. 22, 2015), <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0095569> (finding that there is no difference in the net social benefit between maintaining the status quo and legalizing marijuana).

16. See Saad, *supra* note 7; SKDKNICKERBOCKER & BENENSON, *supra* note 7.

17. David Blake & Jack Finlaw, *Marijuana Legalization in Colorado: Learned Lessons*, 8 HARV. L. & POL'Y REV. 359, 380 (2014) (outlining the difficulties of implementing Colorado's Amendment 64, but finding that Colorado has largely met these challenges so far); John Hudak, *Colorado's Rollout of Legal Marijuana is Succeeding*, THE BROOKINGS INST. REPORT (July 31, 2014), <http://www.brookings.edu/research/reports/2014/07/colorado-marijuana-legalization-succeeding>. *But see* Hunter Schwarz, *Two States Have Sued Colorado for Legalizing Marijuana, But It Doesn't Look Like Anymore Will Join*, WASH. POST (Jan. 8, 2015), <http://www.washingtonpost.com/blogs/govbeat/wp/2015/01/08/two-states-have-sued-colorado-for-legalizing-marijuana-but-it-doesnt-look-like-any-more-will-join/>.

18. Alex Kreit, *Beyond the Prohibition Debate: Thoughts on Federal Drug Laws in an Age of State Reforms*, 13 CHAP. L. REV. 555, 556 (2010).

19. See discussion *infra* Parts III & IV.

20. Sean Patrick Farrell, *High and Dry in Pot Country*, N.Y. TIMES (Aug. 6, 2014), <http://www.nytimes.com/video/us/100000003025993/high-and-dry-in-pot-country.html>.

21. MICHAEL O'HARE ET AL., BOTEC ANALYSIS CORP., ENVIRONMENTAL RISKS AND OPPORTUNITIES IN CANNABIS CULTIVATION 4–7 (2013) [hereinafter BOTEC], http://lcb.wa.gov/publications/Marijuana/SEPA/BOTEC_Whitepaper_Final.pdf.

22. For example, the uncertainty that conflicting federal and state laws create discourages individuals who want to grow marijuana legally from entering the market,

Part I of this Note explores the trend towards liberalization of marijuana laws in recent decades, and how these changing social views on marijuana are coming into conflict with the federal prohibition of marijuana and the federal government's clear powers to continue to prohibit marijuana under the Commerce Clause. Part II provides an overview of the environmental impacts of marijuana. Part III explores the relationship between water and marijuana with a brief history of the prior appropriation system followed by a discussion of the role of irrigation districts and the Bureau of Reclamation in the marijuana debate. Part IV discusses the energy use of marijuana under different production practices and recommends shifting cultivation away from energy-intensive indoor methods to outdoor or greenhouse cultivation. Part IV then discusses energy policy on marijuana and how state utilities where marijuana has been legalized are adapting to the new energy demands. Part V discusses the Department of Justice's conflicting policies on marijuana and explains how these policies add to the disjointed and inconsistent federal policy on marijuana. Finally, Part VI offers some basic policy recommendations for the federal government that would create a consistent federal policy and minimize the future environmental impacts of marijuana.

I. BACKGROUND—A RECIPE FOR CONFLICT

A. *The Trend Towards Liberalization*

The liberalization of marijuana laws at the state level reflects a shift in Americans' attitudes towards marijuana.²³ While only 12% of Americans supported legalizing marijuana in 1969, by 2014, a majority of Americans supported legalization.²⁴ Marijuana is also the most commonly used illicit drug in the United States.²⁵ In a 2012 study, an estimated 18.9 million individuals in the United States (7.3% of the population) had used marijuana in the past month.²⁶ The federal government, however, has largely left its policies on marijuana unchanged during that time, at least formally. This has led to a puzzling situation where marijuana is illegal at the federal level, but increasingly legal at the state level.

Ironically, this is a reversal from Congress's treatment of marijuana before it passed the CSA in 1970. In the United States, it was legal to grow and use

depressing the supply from legal growers, and allowing illegal growers to continue to meet the unmet demand of the market. In addition, without strict regulation of the legal marijuana market, illegal growers may be able to move their product into legal channels, such as marijuana dispensaries, where they may be able to demand a higher price for their product than they can through traditional illicit means. *See, e.g.,* Jennifer K. Carah et al., *High Time for Conservation: Adding the Environment to the Debate on Marijuana Liberalization*, 65 *BIOSCIENCE* 822, 826 (2015), <http://bioscience.oxfordjournals.org/content/65/8/822.full.pdf+html>.

23. JASON DERRICKSON, *MARIJUANA LEGALIZATION: STATE INITIATIVES, IMPLICATIONS, AND ISSUES* vii (2014).

24. *See* Saad *supra* note 7; SKDKNICKERBOCKER & BENENSON, *supra* note 7; *see also* DERRICKSON, *supra* note 23, at viii.

25. DERRICKSON, *supra* note 23, at vii.

26. *Id.* at viii.

marijuana until 1937.²⁷ In fact, it was the *states* that first led the move to make marijuana illegal, with 34 states changing their laws between 1911 and 1933 so that marijuana could only be manufactured for medicinal and industrial use.²⁸ The Marihuana Tax Act of 1937 was the first federal law on marijuana, and it imposed a steep transfer tax stamp on every sale of marijuana.²⁹ The states' movement towards temperance occurred simultaneously with alcohol prohibition.³⁰ But, while the Prohibition Era (making alcohol illegal) came and went between 1920 and 1933, states continued to pass anti-marijuana laws long afterwards.³¹ Why marijuana prohibition continued, even after alcohol prohibition was deemed a failure is not entirely clear, particularly because there are so many similarities between the Prohibition Era and the current era of marijuana prohibition.³²

The Eighteenth Amendment to the U.S. Constitution banned the sale, production, transportation, and consumption of alcoholic beverages from 1920 to 1933.³³ Like marijuana criminalization, the movement towards prohibiting alcohol was mostly politically motivated,³⁴ and had racist roots.³⁵ For example, during the alcohol prohibition era, prohibitionists claimed that alcohol could turn “black [men] into [] ‘beast[s]’” and Hispanic men into killers.³⁶ Still, while alcohol prohibition had racist roots, its primary purpose was to save white people from themselves, and was founded on religious rhetoric.³⁷ In contrast, marijuana laws were largely built around racist rhetoric framed as saving whites from minorities, and saving minorities from their lack of self-control.³⁸ This enduring legacy of racism in marijuana laws may help to explain its longevity in comparison to alcohol prohibition, which came and went rather quickly.³⁹

Despite this difference, the similarities between alcohol and marijuana prohibition are significant. Both empowered organized crime organizations: in the case of alcohol prohibition, bootleggers and mobsters; and in the case of marijuana prohibition, drug cartels.⁴⁰ Neighboring countries supplied America's demand for

27. *Id.* at 5.

28. ALYSON MARTIN & NUSHIN RASHIDIAN, *A NEW LEAF: THE END OF CANNABIS PROHIBITION* 38 (2014).

29. DERRICKSON, *supra* note 23, at 5. Under the Marihuana Tax Act, marijuana and its cultivation was legal as long as the grower or seller had a tax stamp issued by the U.S. Treasury Department, but the tax stamps were incredibly expensive even by today's standards—\$100 per ounce—so, unsurprisingly, the Treasury Department rarely issued the tax stamps, effectively making marijuana illegal. PAUL M. GAHLINGER, *ILLEGAL DRUGS: A COMPLETE GUIDE TO THEIR HISTORY, USE AND ABUSE* 62 (2004).

30. GAHLINGER, *supra* note 29, at 60.

31. *Id.*

32. MARTIN & RASHIDIAN, *supra* note 28, at 201.

33. See Scott Schaeffer, *The Legislative Rise and Populist Fall of the Eighteenth Amendment: Chicago and the Failure of Prohibition*, 26 J.L. & POL. 385, 401, 409 (2011).

34. MARTIN & RASHIDIAN, *supra* note 28, at 201.

35. *Id.* at 39–41, 201.

36. *Id.* at 39–40.

37. *Id.*

38. *Id.* at 39.

39. *Id.*

40. *Id.* at 201.

the outlawed substances—Canada for liquor and Mexico for marijuana.⁴¹ In both cases, the federal government targeted consumers more than producers or distributors of the illicit substances, often leading to punishment of the least culpable.⁴² Under Prohibition, states one by one chose not to enforce the federal prohibition of alcohol and left federal agents to raid speakeasies and arrest drinkers; similarly, since the 1970s, states have one by one decriminalized or legalized marijuana.⁴³ Based on these similarities, it seems that marijuana prohibition is ultimately headed in the same direction as the short-lived alcohol Prohibition Era, although it may still take many years before the federal government legalizes marijuana.

B. Federal Powers Under the Commerce and Supremacy Clauses

Since the 1970s when marijuana was criminalized at the federal level, public support for marijuana prohibition has steadily declined.⁴⁴ Despite this clear trend, however, Congress's power to prohibit marijuana is not in question. The Commerce Clause gives Congress clear power to prohibit marijuana and to supersede state laws.⁴⁵ Under the U.S. Constitution's Supremacy Clause,⁴⁶ the federal government also has the authority to preempt state laws that conflict with federal laws on marijuana, making those state laws void and without effect.⁴⁷ In *Gonzales v. Raich*, the U.S. Supreme Court held that Congress has the power to regulate the consumption, cultivation, and commercialization of marijuana under its Commerce Clause powers; the Court concluded that Congress had a rational basis for believing that prohibition of the intrastate manufacture and possession of marijuana under the CSA was "necessary and proper" for regulating marijuana as a fungible commodity between states.⁴⁸ This power extends even to intrastate activities that are in accordance with state law.⁴⁹

The Supremacy Clause states:

[T]his Constitution, and the Laws of the United States which shall be made in Pursuance thereof . . . shall be the supreme Law of the Land; and the Judges in every State shall be bound thereby, any Thing in the Constitution or Laws of any State to the Contrary notwithstanding.⁵⁰

41. *Id.*

42. *Id.* at 201, 218 (stating that of the 1.53 million drug arrests made in 2011, 49.5% were for marijuana, and of those, 87% were for possession only).

43. *Id.* at 201.

44. See Saad, *supra* note 7; SKDKNICKERBOCKER & BENENSON, *supra* note 7.

45. See *Gonzales v. Raich*, 545 U.S. 1, 2 (2005) ("Congress' Commerce Clause authority includes the power to prohibit the local cultivation and use of marijuana in compliance with California law.").

46. U.S. CONST. art. VI, cl. 2.

47. DERRICKSON, *supra* note 23, at 34.

48. U.S. CONST. art. I, § 8, cl. 3 ("To regulate commerce with foreign nations, and among the several states, and with the Indian tribes"); *Raich*, 545 U.S. at 22.

49. *Raich*, 545 U.S. at 29.

50. U.S. CONST. art. VI, cl. 2.

Analysis under this clause begins with “the basic assumption that Congress did not intend to displace State law.”⁵¹ This presumption is strongest in areas where the states traditionally regulate.⁵² Under their police powers, states are responsible for protecting the health, safety, and wellbeing of their citizens.⁵³ Therefore, because the CSA is a federal law that regulates in an area traditionally reserved to the states, a state law will not be preempted “unless that was the clear and manifest purpose of Congress.”⁵⁴ While the Court held in *Raich* that Congress acted within its Commerce Clause powers in regulating marijuana under the CSA, the Court never directly addressed whether the CSA preempted California’s Compassionate Use Act, and the Court has yet to address a challenge to a state law legalizing the recreational use of marijuana.⁵⁵

Further, because health, safety, and welfare generally fall within the states’ police powers, the enforcement of federal drug laws, such as the CSA, is mostly left to the states. Thus, Congress must balance its strong authority to legislate the prohibition of marijuana with the reality that enforcement of those laws becomes very difficult without the states’ support. As more and more states legalize marijuana, and as public support for legalization continues to grow, the possibility that Congress will exercise its Commerce Clause powers looks increasingly unrealistic.

II. THE ENVIRONMENTAL IMPACTS OF MARIJUANA CULTIVATION

Illegal marijuana growers often use energy and water intensive methods to grow their crop. Current unregulated practices are also often harmful to the environment through the release of toxic chemicals into fragile ecosystems and through the illegal clearing of lands for cultivation. However, the environmental impacts of marijuana cultivation depend greatly on the manner in which it is grown. There are three primary methods for growing marijuana: (1) outdoors; (2) indoors with artificial lighting; or (3) in a greenhouse.⁵⁶ Outdoor cultivation is by far the least energy intensive method for growing marijuana, indoor cultivation is the most energy intensive, and greenhouse cultivation is in the middle.⁵⁷ All three methods of cultivation can be practiced in more water and energy-efficient ways, while also minimizing negative impacts to water quality and wildlife.⁵⁸

51. *Medtronic, Inc. v. Lohr*, 518 U.S. 470, 485 (1996).

52. *Raich*, 545 U.S. at 66 (Thomas, J., dissenting).

53. *Id.* at 42 (O’Connor, J., concurring in part).

54. *Medtronic*, 518 U.S. at 485.

55. Dana Kelly, *Bringing the Green to Green: Would the Legalization of Marijuana in California Prevent the Environmental Destruction Caused by Illegal Farms?*, 18 HASTINGS W.-NW. J. ENVTL. L. & POL’Y 95 (2012). *But see* Petition for Writ of Certiorari, *Nebraska v. Colorado*, 135 S.Ct. 2070 (2014) (No. 144), 2014 WL 7474136 (requesting the Supreme Court to grant leave to Nebraska and Oklahoma to file an original action seeking declaratory and injunctive relief that sections 16(4) and (5) of Art. XVIII of the Colorado Constitution are preempted by federal law, and therefore unconstitutional and unenforceable under the Supremacy Clause of the U.S. Constitution).

56. BOTECH, *supra* note 21, at 4.

57. *Id.* at 8.

58. *Id.* at 3.

The environmental impacts of marijuana cultivation are an important aspect of the larger debate around legalization. Marijuana is massively profitable, making the push to grow it, whether legally or illegally, inevitable.⁵⁹ Unfortunately, illegal growers often care little about the environmental impacts of their operations, and are more concerned with maximizing their profits and avoiding the authorities.⁶⁰ To begin, illegal growers sometimes use heavy earth-moving equipment to clear-cut forest in order to plant their marijuana crop.⁶¹ To obtain water for their plants, these growers frequently divert water from creeks illegally and indiscriminately, tapping into streams that may be on someone else's property or may be critical habitat for endangered fish.⁶² Because these illegal growers usually do not have an interest in maintaining the long-term quality of the land, it is not uncommon for them to sprinkle repellants such as rat poison at the base of their plants, which are then washed off with the rain into streams, killing fish and polluting water supplies.⁶³ When they are done harvesting their crop and ready to move on, they regularly leave fertilizers and dangerous chemicals that leach into soil and nearby streams, killing wildlife and causing irreparable damage.⁶⁴

As such, policies that regulate outdoor growing of marijuana and promote more efficient use of indoor and greenhouse-growing methods will help to minimize the environmental impact of marijuana production. If the federal government legalized marijuana, outdoor production would likely increase as producers could come out of hiding and farmers and other producers could transition into marijuana cultivation with confidence and security. This alone would dramatically reduce the intensity of energy use for marijuana cultivation by shifting production from indoors to outdoors.⁶⁵ Federal regulation could also reduce the amount of water used to produce marijuana by discouraging hydroponic production⁶⁶ and promoting best practices.⁶⁷ Policies could include taxing indoor-cultivated marijuana at a higher rate than other cultivation methods; labeling low

59. One study estimates that retail expenditures on illicit marijuana in 2010 were around \$41 billion per year in the United States, although the authors state that a "plausible" range is anything between \$30 and \$60 billion per year. B. Kilmer et al., *What America's Users Spend on Illegal Drugs: 2000-2010*, in *ILLEGAL DRUGS IN THE U.S.: MARKETS AND TRENDS FOR MARIJUANA, METH, HEROIN, AND COCAINE* 4-5 (Lesley Harper ed., 2014).

60. Kelly, *supra* note 55, at 97.

61. Farrell, *supra* note 20.

62. *Id.*

63. Kelly, *supra* note 55, at 98; *see infra* Section VI.B (describing how illegal marijuana cultivation has seriously harmed wildlife and ecosystems in northern California).

64. Farrell, *supra* note 20.

65. *Id.*; *see infra* Section IV.A (exploring the benefits of outdoor production versus other types of marijuana production).

66. Hydroponic production is the process of growing plants with nutrients and water but without soil.

67. BOTECH WHITE PAPER, *supra* note 21, at 14. An in-depth exploration of best practices is beyond the scope of this Note, but the term is meant to include practices that minimize the use of water and energy and minimize harm to ecosystems and wildlife.

green-house-gas (“GHG”)⁶⁸ marijuana so that consumers have a choice, encouraging energy-efficient LED lighting development for indoor production; making energy-efficient production a requirement of licensing; and promoting the development of better technologies and diffusion of best practices to growers.⁶⁹

This Note analyzes separately two of the biggest environmental demands of marijuana: water and energy. Each analysis has a brief history and overview of the policies and laws that have created the respective resource management systems, and then each analyzes how marijuana fits into and impacts the existing structure. Because marijuana has been illegal to grow in the United States, there is little documentation on the water and energy demands of growing marijuana. The information below is based on the best available current information, but estimates often vary widely. In addition, estimates for water and energy demands, as well as other environmental impacts from marijuana production, depend greatly on the methods used and on the size, variety, and location of the marijuana plants.

III. WATER

Marijuana is a relatively water intensive plant.⁷⁰ As such, when developing policy, federal and state governments should examine the use of water resources, particularly in water scarce regions, such as the Western United States. This Section begins with a brief history of the prior appropriation water rights doctrine in the Western states because that is where the legalization and growing of marijuana has been centered in recent decades. Further, because irrigation districts have largely been responsible for the growth and success of agriculture in the western states, Section B examines the relationship between irrigation districts and marijuana. The Bureau of Reclamation (“BOR”) has also had a significant role in building the water infrastructure in the western states that has made irrigated agriculture possible, so the relationship between the BOR and marijuana is explored in Section C.

A. Brief History of Water Management in the West—Prior Appropriation

The United States was governed by the Riparian Rights Doctrine at the beginning of Westward expansion.⁷¹ The Riparian Rights Doctrine, which was

68. GHGs are gases that contribute to global climate change by trapping heat in the atmosphere. The primary GHGs are carbon dioxide (CO₂) (82% of total U.S. GHG emissions in 2013), methane (CH₄) (10% of emissions), and nitrous oxide (N₂O) (5% of emissions). *Overview of Greenhouse Gases*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/climatechange/ghgemissions/gases.html> (last updated Nov. 4, 2015).

69. BOTECH, *supra* note 21, at 3, 20.

70. Carah et al., *supra* note 22 (estimating that water application rates for outdoor-grown marijuana in California are about 430 million L per km² per growing season, or about twice as much per km² as wine grapes in the region); Harriet Taylor, *Water-Guzzling Pot Plants Draining Drought-Wracked California*, NBC NEWS (July 7, 2014), <http://www.nbcnews.com/storyline/legal-pot/water-guzzling-pot-plants-draining-drought-wracked-california-n149861> (explaining that an average marijuana plant uses about six gallons of water per day depending on how and where it is grown).

71. Reed D. Benson, *Alive but Irrelevant: The Prior Appropriation Doctrine in Today's Western Water Law*, 83 U. COLO. L. REV. 675, 679 (2012).

adopted from the English system, arises from ownership of land alongside a natural body of water.⁷² Every landowner has a right to make “reasonable” use of water that touches their land, and all landowners have equal rights against the others.⁷³ Early immigrants to the western United States rejected this system, because water was scarce and they wanted to encourage economic activity.⁷⁴ Instead, these newcomers developed a new water rights system, known as the Prior Appropriation Doctrine,⁷⁵ with its classic principle of “first in time, first in right.”⁷⁶ Each western state has adapted the prior appropriation system to its needs in unique ways, but this complex system is beyond the scope of this paper.⁷⁷ A basic understanding of the Prior Appropriation Doctrine is sufficient to understand the structure and functioning of irrigation districts, the BOR, and their relationships to marijuana cultivation and policy in the western states.

B. Irrigation Districts

As more states legalize medical and recreational marijuana, cultivation will come out of the shadows and come under the state’s regulation. In the western states, irrigation has to be a part of this conversation. Generally, areas that have less than 20 inches of rainfall per year, which is true of much of the western states, are insufficient to grow commercial crops without irrigation.⁷⁸ About 62.4 million acres were irrigated in the United States in 2010, accounting for 38% of all freshwater withdrawals.⁷⁹ The majority of all U.S. irrigation withdrawals (83%) and irrigated acres (74%) were in the 17 contiguous western states (from a line starting in Texas up to North Dakota to the West coast).⁸⁰

A central question since the inception of the federal reclamation program has been “to what degree should state water law control in the management and distribution of water supplied through reclamation projects?”⁸¹ The language of § 8

72. *Id.*

73. *Id.*

74. *Id.* at 680.

75. Under prior appropriation, “beneficial” use of water resources is the foundation of the water right. In other words, a water-rights holder only has rights to the amount of water that he or she can put to “beneficial use”—some purpose that the law regards as useful—and only for as long as he or she puts it to a beneficial use. *Id.*

76. This principle means that the first individuals to make a beneficial use of a water source have the most senior water rights, and any water users that come after them have rights that are junior to theirs. In times of shortage, those with senior water rights can continue to take their full allotment of water, while those with more junior rights must reduce or stop their water use all together. *See* Benson, *supra* note 71, at 682; A. Dan Tarlock, *Prior Appropriation: Rule, Principle, or Rhetoric?*, 76 N.D. L. REV. 881, 881 (2000).

77. Benson, *supra* note 71, at 682.

78. Molly A. Maupin et al., *Estimated Use of Water in the United States in 2010*, U.S. GEOLOGICAL SURVEY CIRCULAR 1405, at 25 (2010), <http://pubs.usgs.gov/circ/1405/>.

79. *Id.*

80. *Id.*

81. BARTON H. THOMPSON, JR. ET AL., *LEGAL CONTROL OF WATER RESOURCES: CASES AND MATERIALS* 843 (5th ed. 2013).

of the Reclamation Act of 1902 seems to make clear that Congress intended state water law to control:

[N]othing in this Act shall be construed as affecting or intended to affect or to in any way interfere with *the laws of any State or Territory relating to the control, appropriation, use, or distribution of water used in irrigation*, or any vested right acquired thereunder, and the Secretary of the Interior, in carrying out the provisions of this Act, shall proceed in conformity with such laws, and *nothing herein shall in any way affect any right of any State or of the Federal Government or of any landowner, appropriator, or user of water in, to, or from any interstate stream or the waters thereof*. Provided, That the right to use of water acquired under the provisions of this Act shall be appurtenant to the land irrigated, and beneficial use shall be the basis, the measure, and the limit of the right.⁸²

The Act's language makes clear that state law should control in reclamation projects, which would seem to suggest that state law on marijuana should control as well. In addition, § 8 suggests that nothing in the Act shall affect the water rights of any state or individual water user when that water is put to "beneficial use." Beneficial use is a use that creates economic benefit,⁸³ and because marijuana is a crop that can be sold for economic benefit, the Act seems to suggest that the federal government cannot interfere with farmers using irrigated water to grow marijuana that is legal in their state. The issue is further complicated by the fact that state laws on the legalization of marijuana have nothing to do with state laws relating to water, so the language of "the laws of any State . . . relating to the control . . . of water used in irrigation" would seem inapplicable to state laws on marijuana. However, the Supreme Court's holding in *California v. United States* offers some clarity on this issue.⁸⁴ In that case, the Court held that a state may only impose conditions on the control, appropriation, use, or distribution of water through a federal reclamation project that are "not inconsistent" with clear congressional directives.⁸⁵ Because state laws legalizing marijuana are clearly inconsistent with Congress's intent to prohibit the use, cultivation, and distribution of marijuana under the CSA, it appears that state law cannot trump federal policy prohibiting the allocation of reclamation water for marijuana cultivation.

C. Bureau of Reclamation Policy on Water for Marijuana Cultivation

On May 20, 2014, the BOR released a temporary policy prohibiting the use of water supplied by the BOR for the cultivation of marijuana in order to

82. 43 U.S.C. § 383 (2012) (emphasis added).

83. *Montana v. Wyoming*, 131 S. Ct. 1765, 1777–78 (2011) (defining "beneficial use" as "that use by which the water supply of a drainage basin is depleted when usefully employed by the activities of man").

84. 438 U.S. 645 (1978).

85. *Id.* at 674.

comply with the CSA.⁸⁶ The policy statement makes it clear that the BOR will not approve the use of BOR facilities or water in the cultivation of marijuana, and that if BOR employees discover that their water is being used to grow marijuana, they will report the use to the Department of Justice (“DOJ”).⁸⁷

The BOR’s new policy is meant to clarify the agency’s role and ensures its compliance with federal law, but it impacts legalized marijuana operations because the BOR operates dams and canals that supply water to farms across much of the western states.⁸⁸ Washington and Colorado, the first two states to legalize recreational marijuana, have major BOR projects, including Washington’s Columbia Basin Project.⁸⁹ In addition, five other states that have BOR projects have legalized marijuana for medical use.⁹⁰ As more states move towards legalization of marijuana for medical and recreational use, BOR policy could impact more and more states, given that the BOR is the largest water distributor in the country.⁹¹ The 2014 temporary BOR policy addresses some of the questions that marijuana legalization raises for BOR water, but it also raises new ones.

While there was some initial concern over the policy announcement among marijuana advocates, the policy lacks an effective enforcement mechanism. Actual enforcement of the temporary BOR policy is left to the DOJ, and as discussed in Part V, the DOJ is currently not targeting producers, sellers, and buyers who comply with state law in states where marijuana is legalized.⁹² Irrigation districts in states with legalized marijuana have now been placed in a difficult position. They are required to comply with federal law and must deal with the BOR’s water use restrictions on marijuana cultivation, but at the same time, they have only limited authority to restrict water deliveries that are consistent with rights established under their state’s system of prior appropriation.⁹³ Washington’s Supreme Court has made clear that irrigation districts must respect water users’ existing water rights and may not adopt rules or regulations that discriminate

86. U.S. BUREAU OF RECLAMATION, PEC TRMR-63, RECLAMATION MANUAL POLICY: USE OF RECLAMATION WATER OR FACILITIES FOR ACTIVITIES PROHIBITED BY THE CONTROLLED SUBSTANCES ACT OF 1970 (2014) [hereinafter BOR CSA POLICY], http://www.usbr.gov/recman/temporary_releases/pectrmr-63.pdf (stating that the expiration date of the policy is May 16, 2016).

87. *Id.*

88. Eric L. Christensen, *Bureau of Reclamation Issues Policy Prohibiting Use of Federal Water for Marijuana Cultivation*, GORDON THOMAS HONEYWELL, LLP, ENERGY & NAT. RESOURCES L. BLOG (May 21, 2014), <http://www.energynaturalresourceslaw.com>.

89. *Id.*

90. The five states that have both legalized medical marijuana and have BOR projects are Arizona, California, Montana, New Mexico, and Nevada. *See Projects and Facilities Database*, RECLAMATION, <http://www.usbr.gov/projects/> (last updated Oct. 8, 2015); *23 Legal Medical Marijuana States and DC*, PROCON.ORG, <http://medicalmarijuana.procon.org/view.resource.php?resourceID=000881> (last updated Nov. 12, 2015).

91. *See Bureau of Reclamation - About Us*, RECLAMATION, www.usbr.gov/main/about (last updated July 22, 2015).

92. BOR CSA POLICY, *supra* note 86, at 2.

93. *Id.*

between users on the basis of which crops are grown.⁹⁴ This places irrigation districts, such as Washington's, between a rock and a hard place in navigating conflicting state and federal laws.

Districts and water boards are finding ways to respond to the BOR's policy, however. For example, the Board of Water Works of Pueblo County, Colorado signed two resolutions on August 19, 2014 that attempt to work within the restrictions of the BOR policy.⁹⁵ The resolutions allow for the sale of water from the Board's direct flow rights in Pueblo Dam, but do not allow for the sale of water with federal links to growers.⁹⁶ The second resolution makes up to 800 acre-feet (260 million gallons) of raw water available to marijuana growers in Pueblo County annually through leases.⁹⁷ Not only do the resolutions ensure that Pueblo County is in compliance with state law and BOR policy, but they could provide up to \$500,000 in revenue each year at the current rate of \$630 per acre-foot.⁹⁸ Other irrigation districts, such as Washington's Benton Irrigation District, are simply sending the BOR policy to known marijuana growers and, upon the BOR's request, informing the BOR of the known marijuana growers in the irrigation district.⁹⁹

IV. ENERGY

Energy consumption is arguably the most significant single environmental impact of marijuana production; however, consumption rates vary dramatically depending on the production practices employed.¹⁰⁰ Under current laws, indoor marijuana cultivation is encouraged, at least in part, because of the uncertainty created by conflicting federal and state laws. When marijuana is illegal, growing indoors is more appealing because it is easier to hide operations from the authorities, and even though the input costs of indoor cultivation are high, the price of marijuana—in a market where it is illegal—makes them worthwhile.

94. *Id.*

95. Bd. of Water Works of Pueblo Cty., *Resolution No. 2014-04* (Aug. 19, 2014), http://www.pueblowater.org/images/Resolution_2014-4_Signed.pdf; Bd. of Water Works of Pueblo Co., *Resolution No. 2014-05* (Aug. 19, 2014) [hereinafter Res. 2014-05], <http://www.pueblowater.org/images/Resolution%202014%20-05.pdf>. *But see* Kittitas Reclamation Dist., *Resolution No. 2014-3* (July 8, 2014), <http://www.krddistrict.org/KRD%20water%20cultivation%20marijuana.pdf> (deciding that the board of directors of the Washington State irrigation district will not approve the use of any of its own facilities or water in the cultivation of marijuana).

96. Ryan Smith, *Colorado County Proposes Policies to Provide Water for Growing Marijuana*, MPP (June 17, 2014, 6:38 AM), <http://blog.mpp.org/medical-marijuana/colorado-county-proposes-policies-to-provide-water-for-growing-marijuana/06172014/>.

97. Chris Woodka, *Board Eyes Water for Marijuana*, PUEBLO CHIEFTAIN (June 17, 2014), <http://www.chieftain.com/special/marijuana/2649149-120/marijuana-pueblo-federal-board>.

98. *Id.*; *see also* Res. 2014-05, *supra* note 95, at 2.

99. Meeting Minutes from the Benton Irrigation District's Board of Directors Meeting, June 23, 2014, <http://www.bidwater.org/bidblog/wp-content/uploads/2010/03/June-23-2014-Board-of-Directors-meeting-minutes.doc>.

100. BOTEC, *supra* note 21, at 5.

However, indoor cultivation is by far the most energy intensive method for growing marijuana.¹⁰¹

A. Energy Profile and Carbon Footprint of Marijuana

Currently, approximately two-thirds of marijuana produced in the United States is grown outdoors.¹⁰² However, indoor production of marijuana accounts for a much greater share of energy use in the United States. A recent report by the Northwest Power and Conservation Council (“NPCC”) estimated that the demand for electricity by marijuana growers represented 80 to 160 MW of new load to the regional system.¹⁰³ Much of that growth in demand comes from an increase in indoor marijuana growing, which is significantly more energy intensive than other methods of growing marijuana.¹⁰⁴ According to estimates by the NPCC, one kilogram of marijuana produced indoors requires 4,000 to 6,000 KWH (kilowatt hours).¹⁰⁵ In comparison, it takes only 16 KWH to produce one kilogram of aluminum, which is typically considered to be an energy-intensive product.¹⁰⁶ To put those numbers in more concrete terms, the energy required to grow four marijuana plants indoors is equivalent to the amount of energy used by 29 refrigerators.¹⁰⁷ As Fig. 1 shows below, marijuana has the highest energy to dollar ratio of any other industry, despite the fact that marijuana is a high-value crop.

101. *Id.*

102. Evan Mills, *The Carbon Footprint of Indoor Cannabis Production*, 46 ENERGY POL’Y 58, 60 (2012).

103. Memorandum from Massoud Jourabchi to the Power Comm. of Nw. Power & Conservation Council, *Electrical Load Impacts of Indoor Commercial Cannabis Production* (Sept. 3, 2014) [hereinafter NPCC Memorandum], <https://www.nwcouncil.org/media/7130334/p7.pdf> (“Electrical load impacts of indoor commercial cannabis production”); see also *What Is a Megawatt?*, COMMODITIES NOW (Mar. 2010), <http://www.commodities-now.com/reports/power-and-energy/2136-what-is-a-megawatt.html> (“For conventional generators, such as a coal plant, a megawatt of capacity will produce electricity that equates to about the same amount of electricity consumed by 400 to 900 homes in a year.”).

104. BOTECH, *supra* note 21, at 7 (estimating that, for example, marijuana grown in Belgian greenhouses uses about 1% of the energy used in typical indoor production, and can be even less in well-designed greenhouses).

105. NPCC Memorandum, *supra* note 103, at 6; see also Mills, *supra* note 102, at 60 (finding that 4–5 lbs of marijuana grown indoors requires roughly 13,000 kW/h/year).

106. NPCC Memorandum, *supra* note 103, at 6.

107. *Id.* at 5.

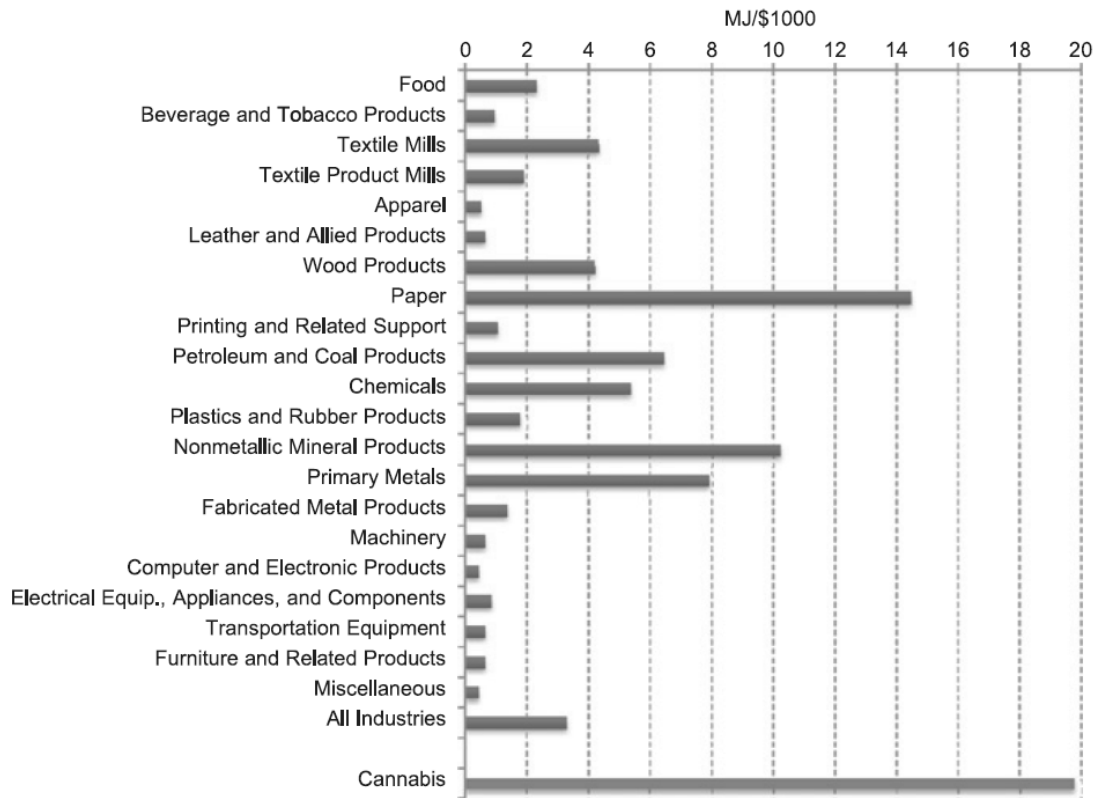


Fig. 1: Comparative Energy Intensities by Sector (2006).¹⁰⁸

The energy used to grow marijuana indoors is significant on a national scale as well. Assuming only one-third of marijuana is grown under indoor conditions, approximately 1% of national electricity consumption goes to grow marijuana.¹⁰⁹ That is equivalent to the energy used by 1.7 million average U.S. homes, or 3 million average American cars, and emits 15 million metric tons of CO₂ at an annual cost of \$6 billion per year.¹¹⁰ In California—the largest producer of marijuana among the states—indoor cultivation is responsible for around 3% of all electricity use, or 9% of household use.¹¹¹ This is equivalent to the energy used by 1 million average California homes, or 1 million average cars, and accounts for energy expenditures of \$3 billion per year.¹¹² For an individual consumer, a single

108. Mills, *supra* note 102, at 62 fig.3.

109. *Id.* at 59.

110. This includes estimates of off-grid, diesel, and gasoline-fueled electric generators which emit 3–4 times as much emissions per-kilowatt-hour. *Id.*

111. *Id.*

112. Interestingly, although California accounts for 50% of total national energy costs, it accounts for only 25% of national carbon emissions from indoor marijuana cultivation due to its higher electricity prices and use of cleaner fuels. *Id.* at 60.

marijuana joint represents 1.5kg (3 pounds) of CO₂ emissions.¹¹³ This is equivalent to running a 100-watt light bulb for 25 hours, or the amount of energy required to make 18 pints of beer.¹¹⁴ For a producer, the national average annual energy costs are approximately \$2,500 per kilogram of finished product, and account for about 50% of the wholesale cost.¹¹⁵

Shifting cultivation outdoors can drastically reduce the amount of energy used to produce marijuana and is the least energy intensive method available for growing marijuana.¹¹⁶ The energy impact of outdoor cultivation depends on the practices and the type of land that is used,¹¹⁷ but one study estimated that the average carbon emissions for outdoor-cultivated marijuana would be 150 kg CO₂ per kg of marijuana, or about 3% of that associated with indoor production.¹¹⁸ Although there is a common perception that marijuana grown indoors is more potent than marijuana grown outdoors, studies have found that they have similar potencies when best practices are used.¹¹⁹ When outdoor cultivation is unregulated and mismanaged, it can have serious negative environmental impacts, including deforestation, and contamination from pesticides, insecticides, rodenticides, and human waste.¹²⁰ But proper regulation could address this mismanagement problem.¹²¹

B. Energy Policy on Marijuana

Electricity has become a basic element of interstate commerce. It is used in almost every home and in almost every commercial and manufacturing facility, and no state is completely energy independent.¹²² Resources used to generate electricity, however, are usually controlled at the state and local level.¹²³ The Department of Energy (“DOE”), created in 1977, combined the nuclear defense programs that began during World War II with a loose-knit mix of energy-related programs throughout the federal government.¹²⁴ Because the energy sector and its infrastructure was largely built and developed before the DOE was established, management and control over energy resources still largely lie at the state and local level. While the DOE has regulatory authority to make energy-related policy,

113. *Id.*

114. *Id.* at 60, 62.

115. *Id.* at 60, 66.

116. *Id.* at 62.

117. For example, whether the marijuana plantation replaced a standing forest or a different crop on agricultural land. *See id.* at 63.

118. *Id.*

119. *Id.* at 62–63.

120. *Id.* at 63.

121. *See, e.g.,* *infra* Part VI.

122. Amy L. Stein, *The Tipping Point of Federalism*, 45 CONN. L. REV. 217, 217 (2011) (quoting *FERC v. Mississippi*, 456 U.S. 742, 757 (1982)).

123. *Id.*

124. *A Brief History of the Department of Energy*, ENERGY.GOV, <http://www.energy.gov/management/office-management/operational-management/history/brief-history-department-energy> (last visited Apr. 22, 2015).

the agency has instead focused its efforts on nuclear cleanup and technological innovation in recent decades.¹²⁵

Public utility companies in states where marijuana has been legalized have been quick to adapt to and be proactive in their handling of new state-legal growers.¹²⁶ This is largely out of necessity, as the utilities understand that legalization could lead to a noticeable increase in the demand for energy within their systems.¹²⁷ Xcel Energy, Inc. in Colorado, for example, has already begun tracking state licensed marijuana facilities in the state and estimates that they use 150–200 gigawatt hours per year, or about 0.5% of Xcel’s total energy sales.¹²⁸

The uncertainty created by the state–federal conflict over marijuana legalization has led public utility companies to adopt different strategies when it comes to trying to encourage energy efficiency for state-legal marijuana growers.¹²⁹ For example, the Snohomish County Public Utilities District (“SCPUD”), which serves much of the area north of Seattle, Washington, and is the 12th largest utility in the nation, recently considered offering incentives for efficient lighting to legal marijuana growers, but it decided it could not take the risk.¹³⁰ SCPUD was concerned that if it offered cash rebates to marijuana growers, it would risk grants that the state receives from the federal government that have nothing to do with marijuana.¹³¹ In addition, SCPUD was concerned about running afoul of the Bonneville Power Administration, a federal agency that supplies about 80% of SCPUD’s energy through hydroelectric dams that it operates in the Columbia River Basin, and which provides about a third of all power used in the Pacific Northwest.¹³² Bonneville has not yet made its position clear with regards to providing energy for state-legal marijuana cultivation.¹³³

On the other hand, two other public utilities in Washington (Puget Sound Energy and Avista Corporation) have offered substantial rebates to marijuana growers, and so far the federal government has not given any sign that it will push back on these utilities.¹³⁴ Xcel Energy in Colorado has also given rebates to some growers.¹³⁵ These companies have been tight-lipped about how much and to whom they have given rebates to, most likely because of concerns over federal action against them. However, according to at least one source, Avista gave a single marijuana grower a rebate of \$163,000, or \$291 per light, for switching from high-intensity lights to LEDs.¹³⁶ While the DOE has not been active in this area as of

125. *Id.*

126. David Ferris, *Utilities Struggle to Control Appetites in Energy-Hungry Marijuana Industry*, E&E PUB. (Aug. 8, 2014), <http://www.eenews.net/stories/1060004230/print>.

127. *Id.*

128. *Id.*

129. *Id.*

130. *Id.*

131. *Id.*

132. *Id.*

133. *Id.*

134. *Id.*

135. *Id.*

136. *Id.*

yet, federal policy in the energy sector could have a significant impact on carbon emissions by encouraging LED lights through federal rebates or other incentives, or by discouraging indoor marijuana cultivation through other mechanisms all together.

V. CONFLICTING DEPARTMENT OF JUSTICE POLICIES ON MARIJUANA

The DOJ's policy on marijuana has been inconsistent in recent years, creating confusion and uncertainty at the state and local level. Most recently, the DOJ has refrained from enforcing marijuana laws in states where it is legal, but history has shown that this policy can change quickly, and sometimes, dramatically. In August 2013, the DOJ issued a memorandum that guides federal prosecutors to exercise prosecutorial discretion when enforcing federal law on marijuana under the CSA.¹³⁷ The memorandum lists eight enforcement priorities for the DOJ, which include preventing the following: marijuana from going to minors and criminal enterprises; transportation out of state; drugged driving; violence; growing on public lands; and possession on federal property.¹³⁸ The DOJ suggests that if states that have legalized marijuana implement regulatory frameworks that address all of these priority areas, "enforcement of state law by state and local law enforcement and regulatory bodies should remain the primary means of addressing marijuana-related activity."¹³⁹ The memorandum clarifies that the size of the marijuana operation alone should not be considered as a proxy for assessing whether federal enforcement is needed if strong and effective state regulatory systems are in place.¹⁴⁰ However, the 2013 Cole Memorandum contains the additional directive that "nothing herein precludes investigation or prosecution, even in the absence of any one of the factors . . . in particular circumstances where the investigation and prosecution serve an important federal interest."¹⁴¹ Thus, the current federal policy can be viewed as a ceasefire, and as with all ceasefires, both sides are aware that the war could start again at any time.¹⁴²

137. Memorandum from James M. Cole, Deputy Attorney Gen., to All U.S. Attorneys (Aug. 29, 2013) [hereinafter Cole Memo 2013], <http://www.justice.gov/iso/opa/resources/3052013829132756857467.pdf> ("Guidance Regarding Marijuana Enforcement").

138. *Id.* at 1–2.

139. *Id.* at 3.

140. *Id.*

141. *Id.* at 4.

142. On October 28, 2014, in response to tribes requesting guidance on the enforcement of the CSA, the DOJ released a policy statement to all U.S. Attorneys which explains that tribes who choose to legalize marijuana on their reservations will be subject to the same considerations and limitations identified in the 2013 Cole Memorandum as states, including the eight priority areas. Memorandum from Monty Wilkinson, Dir., U.S. Dep't of Justice, to All U.S. Attorneys (Oct. 28, 2014), <http://www.justice.gov/sites/default/files/tribal/pages/attachments/2014/12/11/policystatementregardingmarijuanaissuesinindiancountry2.pdf> ("Policy Statement Regarding Marijuana Issues in Indian Country"). In the policy statement, the DOJ clarifies that "[b]ecause marijuana possession and distribution remain illegal under federal law, the policy statement does not and cannot authorize or provide for Department of Justice assistance in the

While the current DOJ policy is meant to provide some certainty to state-legal marijuana producers and sellers that federal agents will not target them if they comply with state regulations, the fact that policies, by their very nature, can be changed at any time undermines any stability that the policy provides. When President Obama first came into office, he promised to reverse President George W. Bush's policy of high-profile raids on medical marijuana dispensaries.¹⁴³ This new policy was codified in a memorandum written by Deputy Attorney General David Ogden.¹⁴⁴ Known as the "Ogden Memo," this memo advised federal law-enforcement officers not to target patients and caregivers who are operating in "clear and unambiguous compliance with existing state law."¹⁴⁵ Yet, just two years later, the administration took a sharp turn and adopted a hardline approach against marijuana growers and dispensaries once again.¹⁴⁶ In June 2011, Deputy Attorney General James Cole, who replaced Ogden, wrote a memorandum revoking the broad definition of "caregiver" adopted in the Ogden Memo so that it no longer applied to commercial operations cultivating, selling, or distributing marijuana.¹⁴⁷ The Cole Memo essentially was a return to the hardline Bush policy.¹⁴⁸

Seen in this light, the recent 2013 memorandum from Deputy Attorney General Cole does not provide the level of certainty that its language suggests. In addition, the new memorandum makes clear that the policy announcement "does not alter in any way the Department's authority to enforce federal law, including federal laws relating to marijuana, regardless of state law."¹⁴⁹ Federal prosecutors still have the discretion to ignore the policy "if state enforcement efforts are not *sufficiently robust*."¹⁵⁰ This memorandum fails to define what state enforcement efforts would be considered "sufficiently robust," making future federal actions under the policy unpredictable and discretionary.

The Hinchey–Rohrabacher Amendment, passed by Congress and signed into law by President Obama in December 2014, further complicates the role of the

establishment of a marijuana regulatory structure." *Id.*; see also U.S. DEP'T OF JUSTICE, POLICY STATEMENT REGARDING MARIJUANA ISSUES IN INDIAN COUNTRY FREQUENTLY ASKED QUESTIONS (Jan. 28, 2015), http://www.justice.gov/sites/default/files/faqs_policy_statement_regarding_marijuana_issues_in_indian_country_28jan15.pdf.

143. Tim Dickinson, *Obama's War on Pot*, ROLLING STONE (Feb. 16, 2012), <http://www.rollingstone.com/politics/news/obamas-war-on-pot-20120216>.

144. *Id.*

145. Memorandum from David W. Ogden, Deputy Attorney Gen., U.S. Dep't of Justice, to Select U.S. Attorneys (Oct. 19, 2009) [hereinafter Ogden Memo 2009], <http://www.justice.gov/sites/default/files/opa/legacy/2009/10/19/medical-marijuana.pdf> ("Investigations and Prosecutions in States Authorizing the Medical Use of Marijuana").

146. Dickinson, *supra* note 143.

147. *Id.*; Memorandum from James M. Cole, Deputy Attorney Gen., U.S. Dep't of Justice, to U.S. Attorneys (June 29, 2011) [hereinafter Cole Memo 2011], www.justice.gov/sites/default/files/oip/legacy/2014/07/23/dag-guidance-2011-for-medical-marijuana-use.pdf ("Guidance Regarding the Ogden Memo in Jurisdictions Seeking to Authorize Marijuana for Medical Use").

148. *Id.*

149. Cole Memo 2013, *supra* note 137, at 4.

150. *Id.* (emphasis added); see also Firestone, *supra* note 5.

DOJ in enforcing the federal prohibition against marijuana.¹⁵¹ The Amendment specifically prohibits the use of DOJ funds to prevent “States from implementing their own State laws that authorize the use, distribution, possession, or cultivation of medical marijuana.”¹⁵² The Amendment has been read by some to mark the end of the DOJ’s crackdown on medical marijuana.¹⁵³ But others are less confident, arguing that parts of the Memorandum could be interpreted narrowly so that medical marijuana dispensaries in some states are viewed as not being explicitly authorized by the state.¹⁵⁴

Deputy Attorney General Cole issued guidelines in February of 2014 in order to give financial institutions and state-legal operators confidence that they would not be prosecuted if they provided services to legitimate marijuana businesses in states that legalized the medical or recreational use of the drug.¹⁵⁵ This policy, however, preserves the broad federal discretion found in the other DOJ memoranda discussed previously.¹⁵⁶ The policy states that prosecutions “may not be appropriate” when financial institutions do business with marijuana entities that are operating legally under state law and do not violate any of the eight enforcement priorities set forth in the 2013 Cole memorandum discussed above.¹⁵⁷ The use of the term “may not be appropriate” preserves the DOJ’s discretionary power to prosecute and does not provide much certainty for banks or for those working as state-legal marijuana sellers and growers.¹⁵⁸

151. Consolidated and Further Continuing Appropriations Act 2015, H.R. Rules Comm., 113th Cong. (Dec. 9, 2014), <http://www.gpo.gov/fdsys/pkg/CPRT-113HPRT91668/pdf/CPRT-113HPRT91668.pdf>.

152. *Id.*; David Downs, *President Obama Signs Ceasefire in War on Medical Marijuana*, E. BAY EXPRESS (Dec. 17, 2014), <http://www.eastbayexpress.com/LegalizationNation/archives/2014/12/17/president-obama-signs-ceasefire-in-war-on-medical-marijuana>.

153. Downs, *supra* note 152.

154. Jacob Sullum, *Will the Rohrabacher Amendment Actually Block Federal Prosecution of Medical Marijuana Patients and Their Suppliers?*, HIT & RUN BLOG (Dec. 15, 2014, 3:58 PM), <http://reason.com/blog/2014/12/15/will-the-rohrbacher-amendment-actually> (stating that in California, dispensaries are not explicitly allowed by the state and operate as patient cooperatives, while in Washington, dispensaries operate as “collective gardens,” and in other states, dispensaries are run by groups of “caregivers”).

155. Memorandum from James M. Cole, Deputy Attorney Gen., U.S. Dep’t of Justice, to All U.S. Attorneys (Feb. 14, 2014) [hereinafter Cole Memo 2014], [http://www.justice.gov/sites/default/files/usao-wdwa/legacy/2014/02/14/DAG%20Memo%20-%20Guidance%20Regarding%20Marijuana%20Related%20Financial%20Crimes%20%2014%2014%20\(2\).pdf](http://www.justice.gov/sites/default/files/usao-wdwa/legacy/2014/02/14/DAG%20Memo%20-%20Guidance%20Regarding%20Marijuana%20Related%20Financial%20Crimes%20%2014%2014%20(2).pdf) (“Guidance Regarding Marijuana Related Financial Crimes”).

156. See Cole Memo 2013, *supra* note 137; Cole Memo 2011, *supra* note 147; Ogden Memo 2009, *supra* note 145.

157. Cole Memo 2014, *supra* note 155, at 2–3.

158. Despite these guidelines, virtually every bank in the United States has decided not to do business with state-legal marijuana enterprises because the risks outweigh the benefits. Schwartz, *supra* note 1. Regulators and the DOJ require banks to detect and report suspicious financial transactions, including imposing the regulatory burden on banks of filing Suspicious Activity Reports (“SARs”) for every state-legal marijuana business that is a customer of the bank, regardless of whether they are engaged in suspicious activity or

VI. POLICY RECOMMENDATIONS: THE PATH FORWARD

Although it seems that Congress is not yet ready to pass a comprehensive reform bill on marijuana, there are signs that Congress is moving in that direction. On July 28, 2014, four U.S. Senators (Patty Murray and Maria Cantwell of Washington; Mark Udall and Michael Bennet of Colorado) wrote a letter calling on the Obama Administration to set consistent federal policies on marijuana. The letter stated “[a]t times . . . certain federal agencies have taken different approaches that seem to be at odds with one another and may undermine our states’ ability to regulate the [marijuana] industry adequately.”¹⁵⁹ The Senators further wrote:

[W]e believe it is appropriate for the White House to assume a central and coordinating role for this government-wide approach. We therefore believe it is incumbent upon the Administration to work with all federal departments and agencies setting forth a clear, consistent and uniform interpretation and application of the CSA and other federal laws that could affect the industry.¹⁶⁰

As more states legalize marijuana, calls for federal reform will likely increase as congressional leaders seek to represent their state’s interest. In fact, congressional action has increased. The Rohrabacher-Farr Medical Marijuana Amendment, included in the omnibus government-funding bill and signed into law in December 2014, prevents the DEA from interfering with state medical marijuana laws.¹⁶¹ The McClintock-Polis Marijuana Amendment, which would prevent the DEA from prosecuting people who use, sell, or possess marijuana in compliance with state law narrowly failed on a House vote of 206–222.¹⁶² Should Congress and the next Administration choose to take further action on marijuana policy, the following are some policy recommendations they should take into account.¹⁶³

not. *Id.*; see also FIN. CRIMES ENF’T NETWORK, U.S. DEP’T OF THE TREASURY, FIN-2014-G001, BSA EXPECTATIONS REGARDING MARIJUANA-RELATED BUSINESSES (Feb. 14, 2014), http://www.fincen.gov/statutes_regs/guidance/pdf/FIN-2014-G001.pdf (providing “expectations for financial institutions seeking to provide services to marijuana-related businesses”).

159. Letter from Patty Murray, Mark Udall, Maria Cantwell, & Michael F. Bennet, U.S. Senators, to Denis McDonough, Chief of Staff, and Eric Holder, U.S. Attorney Gen. (July 28, 2014), http://www.murray.senate.gov/public/_cache/files/075fc29f-3a87-4018-b412-3d22da1808f9/072514---wa-co-letter-final.pdf.

160. *Id.*

161. Kristin Lynch, *Marijuana: Polis Pushes Feds to Stay out of State Drug Policy*, CONGRESSMAN JARED POLIS (June 3, 2015), <http://polis.house.gov/news/documentsingle.aspx?DocumentID=397850>.

162. *Id.*

163. While there could be many potential impacts that result from any federal marijuana policy, this Note does not delve into them in any depth. Some potential impacts could include a greater share of agricultural land being used for marijuana cultivation (either by new marginal agricultural land being opened or by marijuana displacing other crops currently being grown) and potential international consequences of any change in the domestic supply and demand for marijuana.

A. Delist Marijuana as a Schedule 1 Controlled Substance under the Controlled Substance Act

Accumulated scientific evidence suggests that marijuana does not meet the criteria to be listed as a Schedule 1 drug under the Controlled Substance Act,¹⁶⁴ which is defined as a substance that: (1) has a high potential for abuse; (2) has no currently accepted medical use in treatment in the United States; and (3) use of the drug under medical supervision lacks accepted safety.¹⁶⁵ This Note briefly outlines the process by which delisting would occur.

Marijuana could be delisted either by an act of Congress or by the Attorney General's finding that marijuana "does not meet the requirements for inclusion in any schedule."¹⁶⁶ The Attorney General can initiate a repeal of the listing of marijuana, by request of the Secretary, or on the petition of any interested party.¹⁶⁷ The Attorney General must then gather the necessary data and request from the Secretary of Health and Human Services scientific and medical evaluations and recommendations as to whether marijuana should be removed as a controlled substance.¹⁶⁸ Factors that the Attorney General must consider include: (1) the potential for abuse; (2) scientific evidence of its pharmacological effect; (3) the state of current scientific knowledge regarding the drug; and (4) risks to public health.¹⁶⁹

Despite the fact that delisting marijuana as a Schedule 1 drug would be the most comprehensive way to address conflicting federal and state law, it is likely politically infeasible in the current congressional climate. Attorney General Eric Holder stated on April 4, 2014 that the administration would not move to delist marijuana unless it had the support of Congress.¹⁷⁰ While 18 members of Congress sent a letter to President Obama urging his administration to delist marijuana, or to at least reschedule it as a substance lower than Schedule II,¹⁷¹ this support was apparently not enough for the Obama Administration to consider

164. Laura M. Borgelt et al., *The Pharmacologic and Clinical Effects of Medical Cannabis*, 33 PHARMACOTHERAPY 195, 196 (2013); Suzanne Johannigman & Valerie Eschiti, *Medical Use of Marijuana in Palliative Care*, 17 CLINICAL J. OF ONCOLOGY NURSING 4 (2013); Barbara S. Koppel et al., *Systematic Review: Efficacy and Safety of Medical Marijuana in Selected Neurologic Disorders: Report of the Guideline Development Subcommittee of the American Academy of Neurology*, 82(17) NEUROLOGY 1556, 1559 (2014); Mary E. Lynch & Fiona Campbell, *Cannabinoids for Treatment of Chronic Non-cancer Pain: A Systematic Review of Randomized Trials*, 72(5) BR. J. CLINICAL PHARMACOLOGY 735, 737 (2011).

165. 21 U.S.C. § 812(b)(1) (2012).

166. *Id.* § 811(a)(2).

167. *Id.*

168. *Id.* § 811(b).

169. *Id.* § 811(c).

170. Angela Bacca, *Attorney General Holder Announces Administration Will Consider Rescheduling Cannabis*, CANNABIS NOW (Apr. 6, 2014), <http://cannabisnowmagazine.com/current-events/joint-opinions/attorney-general-holder-announces-administration-will-consider-rescheduling-cannabis>.

171. Letter from Eighteen Members of Cong. to Barack Obama, President (Feb. 12, 2014), <http://blumenauer.house.gov/images/stories/2014/02-12-14%20Blumenauer%20Rescheduling%20Letter.pdf>.

moving forward with delisting. Because delisting marijuana at the federal level does not seem to be currently politically feasible, this Note next considers other more moderate alternatives.

B. Learn from State Models of Marijuana Regulation

Because the states are leading the way on marijuana regulation, the federal government should look to them in modeling federal policy. As the U.S. Supreme Court has often said, states serve “as laboratories for innovation and experiment.”¹⁷² In forming law and policy, the federal government can learn from both the mistakes and successes of states that have been on the frontier of marijuana legalization. These states are facing new environmental challenges as a result of their moves towards legalization and are finding unique ways to address these concerns. Two such states, Colorado and California, are discussed below.

1. Colorado

Perhaps because Colorado legalized recreational marijuana such a short time ago, the language and implementation of the state’s marijuana related statutes do not yet directly address marijuana cultivation’s environmental impacts.¹⁷³ However, various state and local agencies are addressing environmental impacts through policymaking. For example, the Colorado Division of Water Resources recently released a fact sheet on water use and cultivation of marijuana.¹⁷⁴ The fact sheet includes information about the requirements for getting a well permit to grow marijuana, and how permitting differs for marijuana grown for personal consumption as opposed to commercial production.¹⁷⁵ It also includes links to many other resources where those interested can find more specific information.¹⁷⁶

Local governments have taken action in areas where the state has not. For example, Boulder County, Colorado recently passed a regulatory requirement that each medical marijuana cultivation or retail facility must “directly offset [100%] of the electricity consumption through a verified subscription in a Community Solar Garden, renewable energy generated on site, or equivalent” by January 1, 2016.¹⁷⁷

172. Blakely v. Washington, 542 U.S. 296, 327 (2004).

173. COLO. CONST. art. 18, § 16 (defining recreational uses of marijuana); COLO. CONST. art. 18, § 14 (defining medical uses of marijuana).

174. COLO. DIV. OF WATER RESOURCES, WELL AND WATER USE IN REGARDS TO AMENDMENT 64 AND CULTIVATION OF MARIJUANA (2014), <http://water.state.co.us/DWRIPub/Documents/Amendment%2064-Flyer2014-Final.pdf>.

175. *Id.*

176. *Id.*

177. Matthew Schniper, *Marijuana Growers are Energy Hogs, but Greener Pastures Await*, COLO. SPRING INDEP. (Oct. 22, 2014), <http://www.csindy.com/coloradosprings/marijuana-growers-are-energy-hogs-but-greener-pastures-await/Content?oid=2956472>; *see also* BOULDER, COLO., MARIJUANA LICENSING REGULATIONS (2015), http://www.bouldercounty.org/doc/adminservices/mj_2015regs.pdf.

2. California

In Mendocino County, California, the estimated value of the marijuana grown ranges between \$1.5 billion to \$10.5 billion.¹⁷⁸ For comparison, the entire state's grape crop is valued at just \$75.3 million.¹⁷⁹ California's marijuana crop is "likely the largest value crop (by far) in the state's lineup."¹⁸⁰ Northern California has long been at the epicenter of the marijuana legalization battle in the United States.¹⁸¹ California was the first state to legalize medical marijuana in 1996,¹⁸² and so has had the longest experience in regulating marijuana and experiencing the environmental consequences of under-regulation. Mendocino County has been described as "the marijuana capital of the world" due to its combination of rich soil, moderate temperature, and extensive forests that can be used for camouflage.¹⁸³ The local law enforcement in Mendocino County seized 540,000 plants in 2009 although they estimate that they captured only 5–10% of the marijuana that is illegally grown.¹⁸⁴

A study by the California Department of Fish and Wildlife using Google Earth images found that in some Northern California counties, marijuana farming doubled between 2009 and 2012, causing serious impacts to streams and fish.¹⁸⁵ Some officials see illegal marijuana cultivation as the number one threat to salmon in the Mendocino County area because of illegal marijuana farms sucking up the water that would normally keep local salmon streams running during the dry season.¹⁸⁶

California serves as an example of where the legalization of marijuana alone does not necessarily ensure proper regulation. California also had the disadvantage of being one of the first states to legalize and implement medical marijuana laws, which led the federal government, through the DOJ, to crack down on medical marijuana dispensaries and medical marijuana card holders in the early years.¹⁸⁷ This has created a climate of uncertainty that has overwhelmed the

178. Kelly, *supra* note 55, at 97.

179. *Id.*

180. John Harkinson, *The Landscape-Scarring, Energy-Sucking, Wildlife-Killing Reality of Pot Farming*, MOTHER JONES 49, 50 (Mar./Apr. 2014) (quoting PAUL F. STARRS & PETER GOIN, FIELD GUIDE TO CALIFORNIA AGRICULTURE (2010)), <http://www.motherjones.com/environment/2014/03/marijuana-weed-pot-farming-environmental-impacts>.

181. Michael Polson, *Land and Law in Marijuana Country: Clean Capital, Dirty Money, and the Drug War's Rentier Nexus*, 36 POL. & LEGAL ANTHROPOLOGY REV. 215, 217 (2013).

182. See Karen O'Keefe, *State Medical Marijuana Implementation and Federal Policy*, 16 J. HEALTH CARE L. & POL'Y 39, 44 (2013). California voters approved the initiative, called the Compassionate Use Act, on November 5, 1996. *Id.*

183. Kelly, *supra* note 55, at 97.

184. *Id.* at 97–98.

185. Farrell, *supra* note 20.

186. Harkinson, *supra* note 180, at 64; see also Carah et al., *supra* note 22, at 823 (finding that surface water diversions for marijuana cultivation can significantly reduce or eliminate low-stream flow during California's dry summer season, particularly during drought years, which threatens the survival of rare and endangered species).

187. *Id.*

lack of regulation in the state and has contributed to the massive environmental destruction caused by illegal marijuana growing.

The heavy environmental damage that California has suffered as a result of the rapid growth of marijuana cultivation in the northern part of the state in recent years¹⁸⁸ has been exacerbated by the extreme drought that has plagued the state.¹⁸⁹ As a result, California has been leading the way in implementing regulations and policies to address environmental concerns that can serve as a model at the federal level.¹⁹⁰ The North Coast Regional Water Quality Control Board in California recently released its plan to regulate the California marijuana industry to enforce existing water rules and address environmental damage occurring due to marijuana cultivation across the state.¹⁹¹ The plan, still in development, seeks to coordinate activity among the various state and local agencies attempting to regulate the marijuana industry.

In addition, California's State Water Quality Control Board recently announced that it wants to bring marijuana under its "regulatory purview in order to abate potential negative impacts to waterways and the species that depend on them."¹⁹² Water regulators have started a pilot project in Northern California where the California Department of Fish and Wildlife and the State Water Resources Control Board have teamed up to form the Watershed Enforcement Team ("WET").¹⁹³ The goal is for officials to get people in compliance with existing state environmental laws.¹⁹⁴

C. Place a Federal Tax on Marijuana Using Tobacco or Alcohol as a Model

As states such as Colorado have seen, taxing marijuana can bring large revenues.¹⁹⁵ A 2005 study found that replacing the prohibition of marijuana with a

188. See generally *supra* Part II.

189. The Editorial Board, *Water Wars Boil in California Drought: Our View*, USA TODAY (Apr. 19, 2015, 7:01 PM), <http://www.usatoday.com/story/opinion/2015/04/19/california-drought-water-climate-change-salmon-smelt-editorials-debates/26043985/>.

190. See Adrian Baumann, *Water Board Moves Forward with Marijuana Regulations*, WILLITS NEWS (Dec. 17, 2014, 12:01 AM), http://www.willitsnews.com/localnews/ci_27154530/water-board-moves-forward-marijuana-regulations.

191. *Id.*

192. Sara Jerome, *California Water Regulators Want Authority over Marijuana*, WATER ONLINE (Dec. 30, 2014), <http://www.wateronline.com/doc/california-water-regulators-want-authority-over-marijuana-0001> (quoting David Smith, *State Board: Water Regulations Coming to Cannabis Cultivation*, SISKIYOU DAILY NEWS (Dec. 4, 2014, 8:38 AM), <http://www.siskiyoudaily.com/article/20141204/News/141209870#ixzz3LVm5sfpu>).

193. *Id.*

194. *Id.*

195. In Fiscal Year 2014–2015, Colorado reported total marijuana taxes, licenses, and fees of \$61,372,376 compared to just \$14,787,208 for Fiscal Year 2013–2014. OFFICE OF RESEARCH & ANALYSIS, COLO. DEP'T OF REVENUE, MARIJUANA TAXES, LICENSES, AND FEES TRANSFERS & DISTRIBUTIONS (2015), <https://www.colorado.gov/pacific/sites/default/files/0115%20Marijuana%20Tax%2C%20License%2C%20and%20Fees%20Report.pdf>.

system of taxation and regulation similar to alcohol would produce combined savings and tax revenues of \$10–14 billion per year,¹⁹⁶ a portion of which could be spent on mitigating the environmental impacts of legal and illegal marijuana cultivation. Two recent bills in Congress would have the combined effect of legalizing and taxing marijuana at the federal level: The Regulate Marijuana Like Alcohol Act (Rep. Polis, D-CO), and its companion bill, The Marijuana Tax Revenue Act (Rep. Blumenauer, D-OR).¹⁹⁷ While these bills are not likely to pass with this Congress, its proponents argue that these proposals get more support each time they are introduced, and will eventually gain enough traction to become law.¹⁹⁸

D. Develop Federal Policies that Incentivize Efficient Water Use for Marijuana Cultivation

Legalizing marijuana will bring rogue growers out of the shadows, decreasing the number of growers that use stream and groundwater illegally and contaminate water sources with toxic chemicals. Federal policy should increase punishments for those that damage the environment in violation of state and federal laws, while simultaneously offering incentives for responsible water use. The most important way to incentivize efficient water use, however, is for the federal government to promote regulation of the marijuana industry, either at the state or federal level. Regulation will make it more difficult for bad actors to hide and will allow those growers who comply with regulations, including those that encourage efficient water use, to be rewarded for their efforts by earning greater earnings per unit of marijuana produced than illicit growers.

E. Develop Federal Policies that Incentivize Efficient Energy Use for Marijuana Cultivation

Because marijuana can be very energy intensive when grown indoors, policies are needed that discourage indoor cultivation and incentivize the use of energy-saving devices for growers who do choose to grow indoors. Federal policy can use tax rebates and other incentives to encourage: (1) LED lighting, which is much more energy efficient than traditional lighting; (2) outdoor and greenhouse cultivation; and (3) tiered energy rates to make energy use for marijuana growers beyond a certain threshold prohibitively expensive. Because the federal government does not traditionally control the energy sector, federal agencies, such as the DOE, will have to work hand-in-hand with utility companies, states, and communities to encourage the efficient use of energy in marijuana cultivation. The U.S. Department of Agriculture could also play a role in helping develop policies

196. Miron, *supra* note 15.

197. Tim Devaney, *House Bills Would Legalize Recreational Marijuana*, HILL (Feb. 20, 2015), <http://thehill.com/regulation/233368-house-bill-would-legalize-recreational-marijuana> (stating that the bills were introduced on February 20, 2015); Marijuana Tax Revenue Act of 2015, H.R. 1014, 114th Cong. (Feb. 20, 2015) (showing that no action has been taken on the bill since it was introduced).

198. Lynch, *supra* note 161 (“With each passing year, Congress moves one step closer to leaving marijuana policy up to the states, where it belongs. I’m confident that with time, we’ll finally get there.”).

that regularize and encourage the growing of marijuana outdoors or in greenhouses.

CONCLUSION

Comprehensive federal action is needed to regulate state-legal marijuana and to minimize negative environmental impacts of the burgeoning industry, both legal and illegal. Some environmental benefits would be found by simply legalizing marijuana at the federal level and regulating marijuana growers, sellers, and users. However, the environmental impacts of marijuana can be mitigated much further with concerted and focused policies that target energy efficiency, water efficiency, and minimize pollution and harm to wildlife by promoting best agricultural practices. As a result of various states leading the way on the legalization of marijuana, we are beginning to understand the energy costs, water costs, and other environmental impacts of marijuana, as well as the environmental consequences of lack of regulation. Using this information in crafting federal policies towards marijuana would greatly improve the environmental profile of marijuana cultivation. The trend is clearly towards increasing support for marijuana legalization. The federal government should respond to this trend by developing smart policies that maximize the potential benefits of legalization, and minimize its potential negative consequences—including negative environmental impacts.