Resource Shuffling and the California Carbon Market

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Executive Summary

The California Air Resources Board ("ARB") is responsible for minimizing leakage under the State's comprehensive climate policy, AB 32. Its task is perhaps most complex in the electricity sector, which is organized, regulated, and operated across state lines, and thus readily subject to a form of leakage called resource shuffling. This paper evaluates ARB's approach to regulating resource shuffling, critiques the implications of the current policy trajectory, and offers a proposed rule structure that attempts to reconcile multiple stakeholder interests in an environmentally robust and economically coherent framework.

Conceptually, resource shuffling occurs when a covered entity receives credit for emissions reductions that have not actually taken place. For example, if a California utility swaps its contract for 100 MWh of coal-fired electricity for a Nevada utility's contract for 100 MWh of natural gas-fired electricity, the California utility will be able to report a reduction in emissions, even though no reduction in physical emissions has taken place. In a nutshell, resource shuffling is what happens when a covered entity successfully "offshores" its greenhouse gas liability to an unregulated party.

ARB has previously identified a strong prohibition against resource shuffling as a top priority in its policy development process. The State's carbon market regulations flatly banned resource shuffling, but arguably did not define the prohibited practice in sufficient detail. In response to stakeholder concerns, ARB adopted an interim policy in the form of a staff guidance document. This guidance identifies a series of "safe harbor" provisions. Meeting any of these provisions guarantees that a covered entity does not face legal liability for any possible resource shuffling. Although these safe harbors are not yet formalized in final regulations, ARB has just proposed amendments to the cap-and-trade regulations that would adopt them.

This paper analyzes the effect of ARB's current policy and its anticipated adoption in formal rulemaking later this year. In brief, we find that the safe harbor provisions set out in ARB's guidance document (and codified in its July 2013 discussion draft amendments)

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[1] We are extremely grateful to Deborah Sivas, Michael Wara, and Jim Woodward for their comments on portions of this analysis. All remaining errors and all opinions are the responsibility of the authors.

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are so broad as to completely swallow the prohibition on resource shuffling. We find that almost all transactions can be structured to fit into several of the broadest provisions. On the basis of this finding alone, we believe ARB must reconsider its position in the upcoming rulemaking.

But the problem is not limited to a few loose words; ARB has also indicated an interest in encouraging divestment from legacy coal power plants, without sufficient concern for the attendant leakage risks. We present the fullest accounting of legacy coal contracts and ownership investments to date, analyzing the leakage implications of allowing California entities to fully divest from these interests when the underlying facility is not retired.

Our calculations show the cumulative potential for between 108 and 187 million metric tons of carbon dioxide leakage from the cap-and-trade program by 2020, depending on the type of replacement power selected. Depending on the success of complimentary policies and the use of the allowance price containment reserve, the maximum leakage risk is equivalent to between 47% and 197% of cumulative mitigation expected through 2020 under AB 32.[2] Although a comprehensive comparison of leakage risks from resource shuffling is complex and assumption-laden, one clear pattern emerges from our analysis: the more successful California's comprehensive climate policy becomes, the more a lax regulation on resource shuffling will undermine the cap-and-trade program.

While the policy goal of divesting from coal pre-dates AB 32 and has important environmental benefits, we argue that ARB has not accounted for the conflict with its statutory requirement to minimize leakage under AB 32. Given that ARB has already provided free allocations to utilities on the basis of their expected compliance costs—under the assumption that there would be a firm prohibition on resource shuffling—we are skeptical of any policy trajectory that permits utilities to leak their legacy emissions profile through safe harbors. And the problem is huge: ARB freely allocated 716 mmtCO_2 to utilities through 2020, worth over $10 billion at current market prices. It is hard to imagine a justification for providing these allowances to compensate utilities (and their ratepayers) for compliance costs they are then permitted to avoid at the expense of the market's integrity.

Although we are critical of the current policy approach, we recognize that ARB faces a difficult task in its upcoming rulemaking. To contribute constructively to the discussion, we offer a fully developed proposal for the upcoming regulation that, in our opinion, embraces multiple stakeholder goals while addressing the concerns we raise here. The proposed rule would:

- Specify the elements of resource shuffling the State must prove in an enforcement action, providing clarity to regulated entities and regulators alike;
- Explicitly retain regulators' ability to bring enforcement actions despite the presence of a safe harbor under extremely limited circumstances in which a regulated

[2] *See* Section 4.1, *infra*.

entity knowingly exploits a safe harbor to construct trades that game the basic prohibition;

- Close the broadest loopholes, including the safe harbors that would exempt divestment of legacy coal assets from the ban on resource shuffling; and,

- Establish a "reverse offset" option, through which any party may elect to retain the emissions liability in any transaction while divesting from the other attributes of the underlying contract. In return, the electing party would be deemed not to have engaged in resource shuffling.

We describe each element of the proposed rule in detail, but want to highlight the reverse offset here because it is a new concept that potentially resolves the tension between the goals of minimizing leakage and encouraging divestment from coal.

Elsewhere, ARB has taken a conservative view of carbon offsets, requiring exacting standards for projects or protocols that seek to generate credits for reductions taken outside of AB 32 that regulated entities could use to comply with their legal obligations under AB 32. We believe this conservative approach is the correct way to allow for offsets, and argue that the same approach should be adopted here.

In simplest terms, a weak rule on resource shuffling permits a regulated entity to selectively trade its high-emitting resources for low-emitting resources available on the Western interconnect. From an economic perspective, this looks very much like a near-zero price offset option that ignores additionality. With minimal transaction costs under the current regulatory guidance, parties can re-arrange their contract or ownership interests, reporting reduced emissions—yet actual emissions do not change, as the underlying power plants continue to operate as if nothing had changed. There can be no doubt that ARB would reject a carbon offset protocol with these features; we suggest there is no reason ARB should approach resource shuffling with a lower level of concern.

As a means of addressing this weakness, we propose a mechanism that we call a "reverse offset" because its economic logic mirrors that of a conventional offset. In a conventional offset, covered entities pay entities outside of the AB 32 cap for emissions reductions that occur outside of the system but are counted for compliance within the system. Under the reverse offset, entities within the AB 32 system transfer ownership interests in an electricity contract or power plant to an entity outside of AB 32, but retain the liability for emissions from that contract or facility. Conceptually, the emissions accounting at the state border is reversed: in a conventional offset, in-state entities pay to earn credit for imported emissions reductions; in a reverse offset, in-state entities pay to export emissions liability to unregulated parties.

In economic terms, the reverse offset corrects for the leakage that would otherwise arise in the transaction, pricing the avoided leakage at a market rates. This provision guarantees the environmental integrity of the carbon market and provides the most accurate price signal for compliance costs: the cost of obtaining the needed allowances on the open market. It also preserves the option of divesting away from legacy coal assets. Ad-

mittedly, it raises the cost of divestment, but again, it does so by pricing the externality at exactly the market price of the California system. Moreover, because utility stakeholders have already been fully compensated for these expected costs through the allocations process, it is a fair and reasonable burden to bear.

Finally, we believe our suggested reforms streamline the regulatory structure for resource shuffling, reducing the likelihood that a reviewing court would strike the policy down on preemption grounds. By narrowly tailoring a clear set of rules that can be applied mechanistically, ARB would act to mitigate any challenger's perception that the resource shuffling rules conflict with federal authority to regulate electricity markets.

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1. BACKGROUND

1.1 Electricity Consumption in California.

The differences between California's electricity consumption mix and those of neighboring states are crucial factors influencing the design of the state's carbon market. California has a relatively low-carbon electricity grid, relying primarily on natural gas, hydropower, and nuclear energy; renewables like wind and solar are playing an increasingly important role, too (see Figure 1). But the state also imports significant amounts from the Pacific Northwest and Southwest, with imports accounting for 31% of total consumption (see Figure 2).[3]

As these figures illustrate, the generation mix of imported power looks very different from the in-state mix. Notably, a large amount of imported power comes from coal, which has the highest greenhouse gas emissions profile of all resources. In addition, an even larger share of imports comes from unspecified sources. In contrast, California generates only a tiny fraction of its power from coal and has no unspecified in-state power because it has complete information about the mixture of in-state generating resources.

While the greenhouse gas implications of conventional coal power are clear, unspecified power presents a more complicated problem. Consumption of electricity from unspecified sources cannot be traced to a particular generation resource, which makes estimating the associated greenhouse gas emissions difficult. One method is to adopt a generic emissions factor that estimates the average emissions intensity of the unspecified power mix. For the California carbon market, ARB selected an emissions intensity factor that resembles that of baseload natural gas emissions.[4] This level is about half of what coal-fired electricity usually generates, which presumably reflects a system in which unspecified power could come from coal, natural gas, or zero-carbon renewable energy.

Due to different electricity mixes across Western states, greenhouse gas emissions from imported power account for 47% of California's total emissions from the electricity sector.[5] As this number makes clear, any effort to reduce emissions from California's electricity consumption must pay careful attention to imported power.

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[3] California Energy Commission, Energy Almanac, Total Electricity System Power, available at http://energyalmanac.ca.gov/electricity/total_system_power.html (2011 data).

[4] Cal. Code Regs., tit. 17, § 95111(b) (setting an emissions factor for unspecified imports of 0.428 metric tons CO_2e per MWh consumed).

[5] ARB, California Greenhouse Gas Inventory for 2000-2010, available at http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-10_2013-02-19.pdf. Note that ARB uses a different method for calculating unspecified power emissions here, based on a bottom-up analysis of consumption from different regions. *See* ARB, Detailed 2000-2010 Inventory Tables by IPCC Category, available at http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_ipcc_00-10_all_2013-02-19.pdf. The different methods are justified by the fact that a detailed *ex post* analysis is possible for an emis-

Figure 1: In-state electricity consumption by generation source, 2011 (GWh).[6]

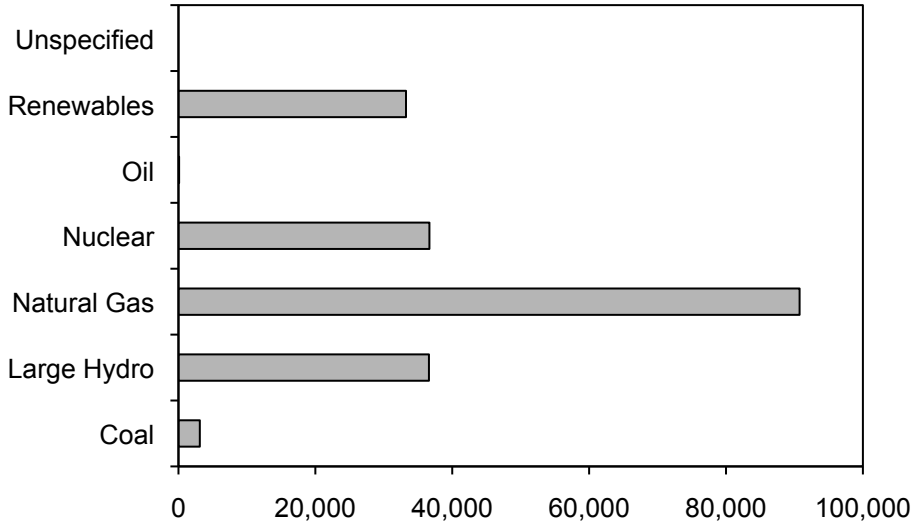
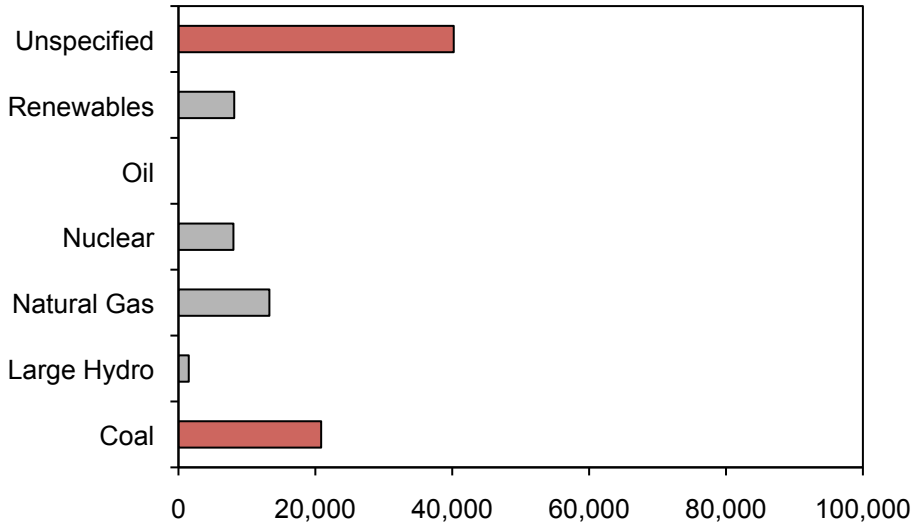


Figure 2: Imported electricity consumption by generation source, 2011 (GWh).[7]



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sions inventory, but cannot be done *ex ante* to estimate an average statewide emissions factor. This is because the future mixture of imported electricity is always subject to change from market forces.

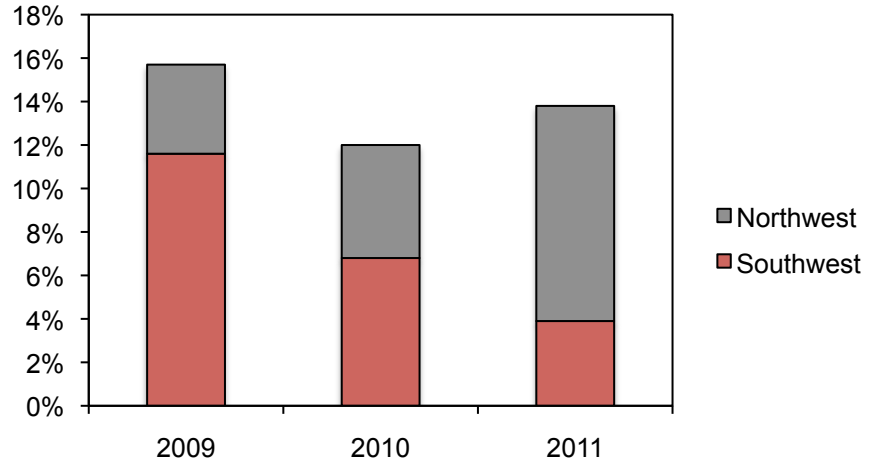
6 California Energy Commission, supra note 3.

7 *Id*.

1.2 Unspecified Power.

Unspecified power is the result of complexities in the physical and legal system for managing electricity. Due to the physics of the electricity system, the popular conception that there are "green electrons" and "brown electrons" is misplaced: for grid-connected customers, there simply is no way to precisely identify a kWh of end-use consumption as coming directly from one particular generation resource or another. Instead, emissions must be determined on a more aggregate level (see Figure 3) and/or tracked on the basis of the legal and financial instruments that govern the industry.

Figure 3: Unspecified Imported Electricity by Origin (% of Total Consumption).[8]



Although this is a difficult problem, it should not be overstated. Indeed, various organized wholesale electricity markets function well—such as the market overseen by the California Independent System Operator—despite the imperfect relationship between financial contracts and the physical nature of the electricity system.

Nevertheless, the contractual features of organized wholesale market and bilateral electricity transactions were not designed to track the greenhouse gas emissions intensity of participating resources. As a result, the organized market structures and bilateral contracts between generators and buyers do not always provide the information necessary to determine the emissions attributes of a particular contract. This is not to say that the basic contracts are unreliable; only that if a market structure is based around determining clear prices, quantities, and timing—without a corresponding focus on the greenhouse gas

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[8] California Energy Commission, supra note 3. Prior to 2009, the CEC did not track unspecified imports directly. Instead, the CEC inferred them indirectly by reference to the generation profile of the exporting region, from which the CEC subtracted specified power transactions.

As a result, data from before 2009 must be inferred by estimation. *See, e.g.*, California Air Resources Board, Documentation of California's Greenhouse Gas Inventory (5th Ed.), available at http://www.arb.ca.gov/cc/inventory/doc/doc_index.php (estimating unspecified power imports and associated emissions for the period 2000-2010).

emissions intensity of each generator—then the market may not be equipped to provide emissions information at the level of each unit of power sold.

One helpful analogy is to think about this problem like the chain of title for real property in the wake of the recent financial crisis. For example, we may not know the true legal owner of a house is if the underlying property right was transferred into a securitized investment vehicle and subsequently sold to many different investors. In this situation, the only way to confirm the true legal owner is to track the change in legal rights at each step of the transactional history for that property. Similarly, the only way to determine the ultimate generating resource behind a particular delivery of power is to trace the contractual relationships at each step back to the original power plant. But if the contractual relationships are not clear, or the necessary data are not publicly available, then it is impossible to determine the ultimate generating resource with certainty.

The issues surrounding unspecified power are particularly important in the context of resource shuffling. Because ARB assigned an emissions factor that resembles baseload natural gas energy, electricity market participants face two incentives. First, any seller of a generation resource that is cleaner than the default emissions factor will have an incentive to take the necessary steps to become a specified source of power. By identifying the lower-carbon nature of the underlying resource, such sellers will reduce the greenhouse gas liability that must be allocated between buyer and seller. Second, any seller of a generation resource that is more carbon-intensive than the default emissions factor will have an incentive to take steps to become an unspecified source of power. By hiding the higher-carbon nature of the underlying resource, such sellers will reduce the greenhouse gas liability that must be allocated between buyer and seller.

From a public policy perspective, the first incentive is a good one, as it will generate more and better market information. In contrast, ARB should be very concerned about the second incentive, which encourages market participants to undermine the fundamental purpose of AB 32. As a result, we believe ARB should anticipate self-interested trading behavior in its resource shuffling regulations. During the discussion of the initial carbon market regulations, ARB appeared to take this position, too. But as we discuss in Sections 3 and 4, ARB's current approach does not provide sufficient protection against this type of leakage. This concern motivates a number of the reforms we offer in Section 5.

1.3 The History of ARB's Resource Shuffling Rule.

ARB has paid close attention to resource shuffling for many years, and has spent considerable time engaging stakeholders over the best way to address the issue in the California carbon market. During the development of its carbon market regulations in August 2011, for example, ARB identified three different practices that it would seek to ban:

- **Cherry picking:** replacing power that has an unspecified emissions factor with power that has a specified, lower emissions factor.

- **Facility swapping:** replacing power that has a high emissions factor with power that has a lower emissions factor.

- **Laundering:** replacing power that has a high emissions factor with power that has an unspecified emissions factor.[9]

ARB continued to express this intention through May 2012, listing all three prohibited practices in a workshop document.[10] In addition, ARB indicated that it intended to exempt two new categories of activity from the definition: changes in electricity deliveries effected pursuant to state or federal law, and deliveries of emergency power.[11]

In September 2012, ARB issued its complete carbon market regulations. These regulations formally defined resource shuffling as follows:

> "'Resource Shuffling' means any plan, scheme, or artifice to receive credit based on emissions reductions that have not occurred, involving the delivery of electricity to the California grid."[12]

Using this formal definition, the regulations prohibit resource shuffling as a violation of the carbon market rules.[13] In addition, the regulations also require all first deliverers of electricity to submit formal attestations to ARB, with the attesting agent subject to penalty of perjury.[14] Although the regulations created a broad prohibition against resource shuffling, none of the detailed considerations found in prior workshop documents made their way into the final regulations.

Many stakeholders expressed concerns in response to the final regulations. Perhaps most prominently, Commissioner Phillip Moeller of the Federal Energy Regulatory Commissioner issued a public letter to California Governor Jerry Brown. In his letter, Commissioner Moeller asserted that ARB failed to clearly define resource shuffling. He argued that this failure, along with the associated attestation requirement, creates significant and undesirable market uncertainty. As a result, Commissioner Moeller asked California to suspend the resource shuffling prohibition until ARB clarifies the associated compliance and enforcement regime.[15]

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[9] California Air Resources Board, *Compliance Obligations of First Deliverers of Electricity*, Staff Presentation at Electricity Technical Meeting (Aug. 26, 2011), available at http://www.arb.ca.gov/cc/capandtrade/meetings/082011/cap-trade-presentation.pdf.

[10] California Air Resources Board, *Cap-and-Trade Program and Electricity Workshop*, Staff Presentation at a Public Meeting to Discuss Compliance Requirements for First Deliverers of Electricity (May 4, 2012), available at http://www.arb.ca.gov/cc/capandtrade/meetings/050412/may4electricityppt.pdf.

[11] *Id*.

[12] Cal. Code Regs., tit. 17, § 95802(a)(250).

[13] *Id*. § 95852(b)(2) ("Resource shuffling is prohibited and is a violation of this article.").

[14] *Id*. §§ 95852(b)(A)-(B).

[15] Letter from Phillip Moeller to Edmund Brown (Aug. 6, 2012), available at http://www.ferc.gov/about/com-mem/moeller/moeller-08-06-12.pdf.

ARB Chairwoman Mary Nichols responded publicly to Commissioner Moeller's letter, acknowledging the need for formal rulemaking to clarify the types of transactions that would fall under (or avoid) the resource shuffling prohibition. In addition, Chairwoman Nichols agreed to suspend the attestation requirement during the first 18 months of the program.[16] Notably, however, Chairwoman Nichols' letter made no indication that ARB intended to suspend or weaken the underlying prohibition on resource shuffling.

Over the following weeks, ARB's approach to resource shuffling evolved rapidly. On the eve of the state's first carbon market auction in November 2012, ARB directed its staff to prepare additional guidance documents employing a "safe harbor" approach.[17] These safe harbors are activities that ARB does not consider to fall under the formal regulatory definition of resource shuffling, which remains in effect. A few weeks later, ARB staff released an update to its regulatory guidance documents, including each of the safe harbors identified in the Board Resolution (hereinafter the "Staff Guidance").[18]

Although informal guidance does not have the same force of law as a statute or formal regulation, the guidance gives a picture of how ARB intends to interpret its regulations. This particular guidance is also, we argue, a reversal of ARB's prior stance on resource shuffling. As we discuss in Section 3, the current safe harbor approach is so permissive that the exemptions completely overwhelm the rule.

On July 18, 2013, ARB released draft amendments to its cap-and-trade regulations that codify the safe harbor approach proposed in the Staff Guidance.[19] While the draft regulations contain some changes—notably, new language that re-states the basic definition of resource shuffling[20]—the proposal is essentially identical to the Staff Guidance.

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16 Letter from Mary Nichols to Phillip Moeller (Aug. 16, 2012), available at http://www.arb.ca.gov/newsrel/images/2012/response.pdf.

17 California Air Resources Board, Resolution 12-51 (Oct. 18, 2012), available at http://www.arb.ca.gov/cc/capandtrade/final-resolution-october-2012.pdf. *See also* Resolution 12-51, Attachment A, available at http://www.arb.ca.gov/cc/capandtrade/attachmenta.pdf (specifying individual safe harbors).

18 California Air Resources Board, Cap-and-Trade Regulation Instructional Guidance, Appendix A: What Is Resource Shuffling? Available at http://www.arb.ca.gov/cc/capandtrade/guidance/appendix_a.pdf (hereinafter the "Staff Guidance").

19 California Air Resources Board, California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms, Discussion Draft July 2013, available at http://www.arb.ca.gov/cc/capandtrade/meetings/071813/ct_reg_2013_discussion_draft.pdf.

20 *Id*. § 95802(a)(252). Specifically, ARB proposed the following language:

> "Resource Shuffling" means any plan, scheme, or artifice ~~to receive credit based on emissions reductions that have not occurred, involving the delivery of electricity to the California grid~~ undertaken by a First Deliverer of Electricity to substitute electricity deliveries from sources with relatively lower emissions for electricity deliveries from sources with relatively higher emissions resources to reduce its emissions compliance obligation. Resource shuffling does not include substitution of electricity deliveries from sources with relatively lower emissions for electricity deliveries from sources with relatively higher emissions resources when the substitution occurs pursuant to the conditions listed in section 95852(b)(2)(A).

Most importantly for the purposes of this analysis, none of the safe harbors proposed by ARB in its draft regulations is substantially different than what the Staff Guidance proposed, nor has the basic logic of the Board's approached changed.[21] For convenience, our analysis here refers to current ARB policy by reference to the Staff Guidance document. Because the text of the proposed regulations are indistinguishable from the Staff Guidance document, however, our criticisms and suggestions apply equally well to the draft language provided by ARB on July 18, 2013.

As ARB moves to conduct a formal rulemaking addressing resource shuffling in the fall of 2013, the Board should take a close look at the resource shuffling policy and design new ways to strengthen the rule while decreasing market uncertainty and avoiding potential conflicts with federal jurisdiction over regulation of wholesale electricity and energy futures markets.

2. LEGAL AND POLICY FRAMEWORK

2.1 California Law Requires ARB to Minimize Leakage.

ARB is required by law to minimize leakage in its design of the cap-and-trade program for greenhouse gases. Under AB 32, leakage is defined as "a reduction in emissions of greenhouse gases within the state that is offset by an increase in emissions of greenhouse gases outside the state." Cal. Health & Safety Code § 38505(j). Resource shuffling creates leakage because an entity that engages in this activity reports emissions reductions that are matched by an increase in emissions outside the state. Recognizing that leakage undermines the purpose and efficacy of state climate policy, the California legislature required the Air Resources Board to "minimize leakage." *Id*. § 38562(b)(8). This requirement is more than an aspiration. ARB must minimize leakage "to the extent feasible and in furtherance of achieving the statewide greenhouse gas emissions limit." *Id*. § 38562(b). Thus, ARB may not adopt a regulation that fails to minimize leakage when alternatives that reduce leakage further are available and feasible.

Because the legal requirement to minimize leakage is clear, ARB would open itself to litigation risk from environmental advocates and climate policy opponents of any persuasion if it adopts a policy that does not minimize leakage. Equally important, any decision by ARB that facilitates large amounts of leakage undermines the goals and purpose of the state's climate policy. As a result, ARB needs to maintain a focus on minimizing leakage as it proceeds to fully define resource shuffling in a new rulemaking.

2.2 ARB's Decision to Allocate Free Allowances to Utilities Encourages Leakage, Absent a Strong Prohibition on Resource Shuffling.

The statutory requirement to minimize leakage is especially important in light of ARB's commitment to provide free allowances to electric utilities for ratepayer benefit.

[21] *Id*. (exempting certain safe harbors from the basic definition of resource shuffling); *id*. § 95852(b)(2) (codifying the Staff Guidance language as formal safe harbors).

Free allocations provide an additional incentive for leakage in the electricity sector, and unless the definition of resource shuffling clearly prohibits anticipated forms of leakage, it will therefore be doubly vulnerable to exploitation by actors in the electricity sector. In particular, utilities could use a weak resource shuffling rule to (1) reduce compliance obligations via leakage, and (2) overcompensate their customers or shareholders by relying on *ex ante* allocation schedules determined on the basis of their relatively high historical emissions.[22] Thus, a commitment to free allocations to utilities recommends additional safeguards against leakage in the definition of resource shuffling.

2.2.1 ARB Provides Free Allocations to Covered Entities.

ARB has already spent considerable time evaluating leakage in the context of regulated industrial activities. *See, e.g.,* ARB Cap-and-Trade Technical Workshop to Discuss Emissions Leakage (July 30, 2012). As a result of detailed negotiations, the Board decided to adopt a policy of freely allocating a certain amount of allowances to industrial entities and electric utilities.

For industry, ARB adopted a schedule of allowance allocations designed to preferentially compensate emissions-intensive industries that are exposed to interstate trade.[23] The allowance distribution is based on a calculated baseline emissions factor multiplied by a predetermined decline in annual free allowances, adjusted by an industry assistance factor.[24] Because the industry allowance allocation incorporates a baseline emissions factor for each industry, it is targeted to address each industry's leakage risks while rewarding individual participants who are more efficient than their competitors.

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[22] Investor-owned electric utilities are required to use all proceeds from initial allocations exclusively to benefit their ratepayers. Cal. Code Regs., tit. 17, § 95892(d). Utilities must also report their use of associated revenues to ARB, demonstrating compliance with this restriction. *Id*. § 95892(e).

Although these requirements force utilities to demonstrate that the direct use of carbon revenue benefits ratepayers, it is possible that investor-owned utilities could develop creative accounting strategies to shift the balance of ratepayer and shareholder benefits through other means. Presumably both ARB and the California Public Utilities Commission will monitor this possibility; however, we note that the current CPUC Order establishing the framework for acceptable utility treatment of carbon allowance revenue prioritizes customer compensation for the rate impacts of the cap-and-trade system above a per capita rebate of the revenues. *See* CPUC, Decision Adopting Cap-and-Trade Greenhouse Gas Allowance Revenue Allocation Methodology for the Investor-Owned Electric Utilities, Decision 12-12-033 in Rulemaking 11-03-012, at 205-206. Notably, implementation of that Order will depend on the extent to which utilities are able to avoid compliance costs by relying on a weak resource-shuffling rule. A weak rule will significantly mitigate rate impacts by enabling leakage. As a result, the CPUC will need to monitor the outcome of the resource shuffling policy to appropriately implement its Order.

While we do not accuse any utility of acting in bad faith, it is reasonable to consider the full range of regulatory incentives. Our point is that an argument that the restricted use of allocation revenues resolves any concern about the distribution of costs and benefits under AB 32 is facile. Any such argument ignores the complex relationship between utilities and their regulators.

[23] Cal. Code Regs., tit. 17, § 95870(e), Table 8-1 (categorizing industries by leakage risk and specifying a corresponding "Industry Assistance Factor").

[24] *Id*. § 95891.

ARB also specified an emissions allocations schedule for electric utilities. The process begins with an allocation of a fixed quantity of allowances to the entire utility sector.[25] The allocation begins with 97.7 mmtCO_2 worth of allowances, discounted by a declining annual factor.[26] Once the annual cap has been determined, each utility gets a predetermined share of the sector-wide allocation, with shares varying by utility and by year.[27]

In total, the allocation to utilities over 2013 through 2020 is 716 mmtCO_2.[28] At the most recent auction settlement price of $14.00 per metric ton,[29] this is equivalent to a transfer of over $10 billion in property rights to utility stakeholders.

2.2.2 The Decision to Provide Free Allocations to Electric Utilities Increases the Risk of Leakage, Unless ARB Also Adopts a Strong Definition of Resource Shuffling.

As a tool to reduce leakage, free allocation makes most sense in the context of covered entities in the industrial sector, which could potentially shut down, relocate, or lose out as their competitors in uncovered jurisdictions expand. This would be a textbook example of leakage, and thus, the free allocation process for industry—which preferentially compensates those industries above other covered entities—is reasonably related to the legal requirement to minimize leakage.[30]

Outside of the case of industrial entities, however, there is very little risk that the carbon price signal would cause utility customers to leave the state. The cost of purchasing electricity and natural gas is a small part of residential and commercial consumers' overall budgets, so these customers are unlikely to leave the state in response to modest price increases arising from the carbon market. This is not to say that utility customers are indifferent to rising prices. Instead, free allocations to electric utilities should be seen as part of the political process of generating compromise on climate policy and balancing costs between affected parties. Accordingly, ARB requires that utilities apply the value of free allocations "exclusively for the benefit of retail ratepayers . . . consistent with the goals of AB 32."[31]

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25 *Id*. § 95870(d).

26 *Id.* § 95891, Table 9-2.

27 *Id.* § 95892, Table 9-3.

28 Calculated by multiplying the initial utility sector allocation of 97.7 mmtCO_2e by the annual cap adjustment factors, and summing each product for each year 2013 through 2020. *See id*. §§ 95891-2.

29 California Air Resources Board, Quarterly Auction 3 Summary Results Report (June 5, 2013 update), available at http://www.arb.ca.gov/cc/capandtrade/auction/may-2013/updated_may_results.pdf. The settlement price for 2013 vintage allowances was $14.00.

30 We do not comment on the desirability of this policy decision—we merely note that it plausibly relates to addressing a possible source of leakage.

31 *Id*. § 95892(d)(3). *See also* California Public Utilities Commission, supra note 22.

Because there is no significant risk of leakage from residential and commercial electricity users, ARB's policy to give free allocations to utilities cannot be justified as a mechanism to minimize leakage. Instead, that decision remains subject to the statutory requirement to minimize leakage, as ARB recognized in its final rulemaking for the carbon market in September 2012. Therefore, the interactions between the free allowance schedule for utilities and other aspects of the cap-and-trade regulations must result in the lowest feasible amount of expected leakage.

Unfortunately, recent ARB documents provide clear and compelling incentives to increase leakage from the electricity sector. We document our concerns with the current policy trajectory in more detail in Sections 3 and 4; although the issues we identify are problematic enough in isolation, they must also be understood in the context of the incentives ARB has already provided to covered entities via free allowances.

ARB's predetermined schedule of free allowances amplifies the incentive to resource shuffle above and beyond the general incentive to do so under any state-based climate policy. For example, if a utility successfully divests from a coal power interest without shutting down the underlying facility, that utility will reduce its compliance obligations—despite the obvious leakage that results—and its customers will enjoy the benefits of an allocations schedule that was determined on the basis of legacy coal emissions. Any opportunity to shed compliance obligations under a weak definition of resource shuffling creates an undue windfall for electric utilities' customers: one that will come at the expense of the economic, environmental, and legal integrity of the market.

Fundamentally, any regulation that weakens the original prohibition on resource shuffling is inconsistent with the allocation schedule ARB finalized for utilities. As ARB staff publicly explained, the primary metric for determining a utility's allowance schedule is its expected compliance costs under AB 32.[32] ARB staff carefully calculated expected compliance costs based on utility projections, assigning initial allocations sufficient to fully compensate each utility for these costs.[33]

Although ARB considered two additional incentives for energy efficiency and early compliance actions, the compliance cost compensation accounted for 94% of the allocation schedule.[34] This allocation method makes sense only in the context of a strong rule prohibiting resource shuffling. Any rule that permits utilities to divest from their highest emitting resources without concern for leakage is completely inconsistent with the allocation schedule for utilities.

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[32] California Air Resources Board, Appendix A: Staff Proposal for Allocating Allowances to the Electric Sector (July 2011), available at http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/allowanceallocation.htm.

[33] *Id*. at 5 ("Under this proposal, the complete annual expected cost burden for each utility is initially allocated.").

[34] *Id*. ("Under this proposal nearly 94% of allowances are allocated to defray expected costs."). In addition, we note that the methodology ARB employed is almost identical to our own estimations in Section 4, with both sets of calculations relying on utilities' submissions of Form S-2 to the California Energy Commission. *Id*. at 3; *id*. at 5, note 10.

For these reasons, ARB must adopt a strong definition for resource shuffling that prohibits all reasonably anticipated forms of leakage from covered entities.

2.3 Other State Electricity Policies Create or Enable Perverse Incentives to Engage in Resource Shuffling.

In addition to evaluating the interaction between the definition of resource shuffling and the allowance allocation schedule, ARB must also pay close attention to the interaction with existing policies in the electricity sector. Crucially, California's emissions performance standard (known as SB 1368) permits California utilities to divest their ownership interests in non-compliant (i.e., coal-fired) facilities, even when that permission conflicts with the statutory requirement to minimize leakage. In retrospect, this is not surprising: SB 1368 was designed to prohibit California utilities from making new investments in proposed coal power plants, not to prevent leakage of greenhouse gas emissions. As a result, compliance with SB 1368 does not demonstrate compliance with AB 32's requirement that ARB's regulations minimize leakage.

Similarly, the State's Renewable Portfolio Standard ("RPS") encourages the increased production of renewable electricity without concern for the attendant leakage risks. Unlike SB 1368, which prohibits certain kinds of new investments, the RPS places an affirmative requirement on utilities to increase their investment in renewable energy. As with SB 1368, however, the purpose of the policy is not entirely consistent with the goals of AB 32. Quite the opposite: blanket permission to replace fossil fuel resources with renewable energy that qualifies under the RPS would constitute a textbook case of facility swapping, one of the types of resource shuffling ARB has previously identified. As a result, compliance with the RPS does not demonstrate compliance with AB 32's requirement that ARB's regulations minimize leakage.

In both cases, ARB needs to anticipate the economic incentives and legal requirements created by the overlapping policy structures in its formal definition of resource shuffling. As we discuss in Section 3, utilities can use compliance with either SB 1368 or the RPS to actively pursue activities that constitute resource shuffling. Thus, ARB's regulations should anticipate and resolve these risks.

2.4 ARB Must Be Careful to Avoid Conflict with Federal Authority.

In addition to satisfying the legal requirements of AB 32, ARB must also pay close attention to the boundary between state and federal authority. In particular, ARB must be careful to ensure that its regulations do not conflict with the enabling statutes of the Federal Energy Regulatory Commission ("FERC") and the Commodities Futures Trading Commission ("CFTC").

2.4.1 The Federal Energy Regulatory Commission.

We begin by analyzing the relationship between ARB's cap-and-trade regulation and the Federal Power Act. The Federal Power Act provides that FERC shall have jurisdiction over "the transmission of electric energy in interstate commerce" and "the sale of electric energy at wholesale in interstate commerce." 16 U.S.C. § 824(b)(1). The Act did

not displace all state regulation of electric energy systems, however, and extends FERC's authority "only to those matters which are not subject to regulation by the States." *Id*. § 824(a). Nevertheless, the Supreme Court has described the language reserving unspecified powers as a "mere policy declaration" that "cannot nullify a clear and specific grant of jurisdiction, even if the particular grant seems inconsistent with the broadly expressed purpose." *New York v. FERC*, 535 U.S. 1, 22 (2002) (quotations omitted). Thus, an argument that Section 824(a) reserves to the states any aspect of federal power that can be justified under Section 824(b) will fail.

The judicial standard for determining whether a federal law preempts a state law or regulation depends on the nature of the challenge. When a state law or regulation is allegedly in conflict with federal power, courts generally start with the "assumption that the historic police powers of the States were not to be superseded . . . unless that was the clear and manifest purpose of Congress." *Id*. at 17-28 (quotations omitted). In contrast, when a federal agency acts to preempt state law, the inquiry does include a presumption against preemption, though a reviewing court must nevertheless establish that the agency is "acting within the scope of its congressionally delegated authority." *Id*. at 18 (quotations omitted).

For example, in *New York*, the Supreme Court ruled that FERC Order 888 was promulgated under FERC's explicit authority to regulate "transmission of electric energy in interstate commerce and . . . the sale of electric energy at wholesale in interstate commerce." *Id*. at 18-19 (citing 16 U.S.C. § 824(b)). Specifically, the Court held that FERC has clear statutory authority to assert jurisdiction over two separate activities: (1) transmitting electric energy in interstate commerce, and (2) selling wholesale electric energy in interstate commerce. *Id*. at 19-20. While FERC's authority to regulate electric sales is limited to wholesale transactions, its authority to regulate transmission of electric energy is not. *Id*. at 20; *see also* 16 U.S.C. § 824(d) (defining "wholesale" as the "sale of electric energy to any person for resale"). As a result, the Court found that Order 888 fell under the explicit authority Congress granted to FERC in Section 824(b), and was thus a valid exercise of federal authority.

Although *New York* upholds FERC's authority to regulate interstate transmission of electric power, it should not be read to indicate that any state law impacting interstate transmission of electric power is necessarily preempted. A reviewing court will likely consider the purpose, nature, and effect of a state law that allegedly conflicts with FERC's authority. In the case of resource shuffling regulations under AB 32, any judicial review of a future challenge is likely to turn on the scope, specificity, and rationale behind ARB's policy structure.

2.4.2 Clear, Mechanistic Rules that Operate in Harmony with FERC's Authority Under the Federal Power Act Will Reduce the Risk of Litigation Over ARB's Resource Shuffling Regulations.

As discussed above, the judicial standard that would apply to any future preemption challenge to ARB's rules on resource shuffling will depend on how the court constructs

the facts of the case, as well as any relevant federal agency's opinion.[35] To the extent a court views ARB's regulations as conflicting with FERC's, or infringing upon FERC's clear authority to regulate interstate transmission of electric energy, the more likely ARB would be to lose. For this reason, the challenger will seek to show that ARB's rules conflict with FERC's established authority to regulate interstate transmission of electric energy.

In contrast, ARB will need to portray a harmonious relationship between state and federal law; even if a reviewing court were to find some potential for conflict, ARB would want to argue that the conflict does not arise under the scope of FERC's congressionally delegated authority. Therefore, ARB will want to argue that the Federal Power Act was never intended to preempt state authority to enact reasonable environmental policy. To succeed with this argument, ARB will want to show that its resource shuffling regulations are narrowly designed to achieve a legitimate environmental purpose. The less that its regulatory approach requires it to actively monitor and police complex market transactions—which are the traditional roles of a price regulator, like FERC—the more likely ARB is to succeed with this argument.

As a result, we believe ARB could reduce its preemption risk by reforming its resource shuffling regulations. In its current policy approach, most of which is codified with loose language through informal guidance, ARB risks creating the impression that its enforcement regime could conflict with FERC's authority over interstate transmission of electric energy. One way to mitigate that risk would be to design a regulatory system that operates mechanistically, with clear, objective liabilities and exemptions. If challenged, ARB could then more readily demonstrate that its regulatory system is narrowly designed to manage the environmental attributes of the electricity industry, with only incidental impacts on interstate transmission of electricity or wholesale power markets. In turn, this position would enable ARB to more confidently assert its authority as a compliment, rather than a potentially conflicting parallel, to FERC's jurisdiction.

With this motivation in mind, the reforms we propose in Section 5 are designed to provide a clear rule structure that requires minimal oversight from ARB. By carefully and explicitly defining covered entities' liabilities and compliance options, the rule structure would reduce the need for ARB to remain actively involved in market oversight. In turn, ARB's reduced involvement in the interpretation of the regulatory structure would lower the litigation risk from a preemption challenge.

2.4.3 The Commodities Futures Trading Commission.

While the potential for conflicting with federal laws is most apparent in the context of FERC's authority over interstate transmission of electric power, a recent case highlights

[35] Of course, if FERC were to issue regulations that it intended to preempt State authority in this area, the legal standard would be significantly more deferential to FERC, which would need only show that these hypothetical regulations fall within its explicit power to regulate interstate transmission of electric energy. *See* 16 U.S.C. § 824(b).

the need for ARB to consider the CFTC's jurisdiction as well. *See Hunter v. FERC*, 711 F.3d 155 (D.C. Cir. 2013).

In *Hunter*, the D.C. Circuit concluded that FERC lacked jurisdiction to conduct enforcement actions in the financial market for natural gas contracts. *Id*. at 156. Although the Energy Policy Act of 2005 provided FERC with the authority to regulate deception either directly or indirectly affecting natural gas ratepayers, the court concluded that the Commodity Exchange Act's language prohibited FERC from asserting authority that Congress exclusively vested in the CFTC. Specifically, the court noted that Congress gave the CFTC "exclusive jurisdiction . . . with respect to accounts, agreements[,] . . . and transactions involving contracts of sale of a commodity for future delivery, traded or executed" on a CFTC-regulated exchange. *Id*. at 158 (quoting 15 U.S.C. § 717t-2(c)). Because the subsequent authority provided to FERC in the Energy Policy Act of 2005 explicitly did not repeal or modify the CFTC's existing authority, the court found that FERC lacked the authority to regulate financial market activities, even though financial market activities had a direct impact on the manipulation of physical market activities that are appropriately within FERC's jurisdiction.

Although *Hunter* directly addressed FERC's authority to regulate natural gas markets, it has the potential to affect FERC's electricity market authority, too. Extending the reasoning in *Hunter* suggests that a reviewing court might take a similar position with respect to FERC's ability to regulate financial markets in the electricity industry. On the other hand, electricity markets are more complex than natural gas markets, as the distinction between physical and financial markets is simpler in the natural gas industry. In contrast, key electricity markets—such as financial transmission rights, or the real time and day-ahead markets operated by Regional Transmission Operators and Independent System Operators—involve a mixture of physical and financial attributes.[36] Nevertheless, if the ruling in *Hunter* were subsequently applied to FERC's authority in the context of electricity markets, ARB would need to be careful to harmonize its regulations with respect to the CFTC's jurisdiction.

3. ANALYSIS: SAFE HARBORS

Several respected economists have recently noted the potential for significant leakage from resource shuffling. For example, Professor Bushnell of UC-Davis and colleagues recently modeled the leakage risks associated with not having a rule on resource shuffling. Simulating future generation across the grid managed by the Western Electricity Coordi-

[36] *See* Patrick Dougherty, Vincenzo Franco, and David Yaffe, D.C. Circuit Holds CFTC has Exclusive Jurisdiction Over Natural Gas Futures Contracts, Finds FERC Lacked Authority to Impose $30 Million Civil Penalty. Van Ness Feldman, LLP News Alert (March 18, 2013), available at http://www.vnf.com/news-alerts-818.html.

nating Council (the western interconnect), they find that emissions increases outside of California largely counteract the in-state reductions under a variety of scenarios.[37]

Five distinguished economists who work on (or for) ARB's Emissions Market Assessment Committee ("EMAC") echoed these concerns in a draft report produced under contract with ARB.[38] They suggest that a permissive prohibition on resource shuffling could result in a range of cumulative of 120 to 360 million metric tons CO_2e, presuming that leakage from out-of-state coal power is not permitted.[39] Furthermore, the authors acknowledge that the lack of an effective prohibition on resource shuffling could result in as much leakage as 428.3 million metric tons CO_2e.[40]

Although top economists have identified the clear potential for leakage from a weak rule on resource shuffling, no public assessment to date scrutinizes the actual regulatory framework ARB has adopted. Here, we evaluate that structure and connect our concerns to the published work on the potential for significant leakage. We conclude that the current safe harbors provide almost unlimited exemptions from the prohibition on resource shuffling, raising the possibility of completely unchecked leakage. We also conclude that the safe harbor guidance clearly permits early divestment from out-of-state coal without any apparent concern for leakage.

In light of these conclusions, we urge the EMAC to revisit the problem of resource shuffling, focusing on the text of current regulations, current ARB guidance documents, and proposed modifications to both. These efforts are particularly important in light of the EMAC's role as a public advisory body to ARB: as part of its stakeholder engagement mandate, the EMAC is expected to "review stakeholder concerns and prioritize them for economic analysis."[41] Our findings suggest the EMAC members' draft lower and upper bound estimates for leakage in the electricity sector should be revised significantly upwards. The concerns we express also call attention to the need for independent economists to suggest solutions.

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37 Bushnell, J., Y. Chen, and M. Zaragoza-Watkins, M., *Downstream Regulation of CO_2 Emissions in California's Electricity Sector*, Energy Institute @ Haas Working Paper #236 (January 2013), available at http://ei.haas.berkeley.edu/pdf/working_papers/WP236.pdf.

38 Pursuant to an agreement between ARB and the University of California Energy Institute, the EMAC provides expert analysis and advice to ARB on market design, operation, and monitoring issues. *See* California Air Resources Board, Emissions Market Assessment Committee webpage, available at http://www.arb.ca.gov/cc/capandtrade/emissionsmarketassessment/emissionsmarketassessment.htm.

39 Bailey, E.M., S. Borenstein, J. Bushnell, F.A. Wolak, and M. Zaragoza-Watkins, Forecasting Supply and Demand Balance in California's Greenhouse Gas Cap and Trade Market (March 12, 2013), § 5, draft white paper available at http://www.stanford.edu/group/fwolak/cgi-bin/sites/default/files/files/BBBWZ_POWER_final(1).pdf. Note that although the authors are affiliated with the EMAC, the draft report does not represent ARB's official position on any issues.

40 *Id*.

41 *See* California Air Resources Board, Emissions Market Assessment Committee webpage, supra note 38.

3.1 ARB's Safe Harbors Are So Broad as to Overwhelm the Prohibition on Resource Shuffling.

A number of the safe harbor provisions in the Staff Guidance document are so broad that most electricity transactions can be structured to fit within their boundaries. As a result, the safe harbors permit market participants to engage in activities that cause massive, widespread leakage. We review each safe harbor in turn, using the paragraph number that corresponds to the listing in the Staff Guidance.[42]

Although we have policy objections to many of the safe harbors, the worst offenders are #6 and #8, which offer nearly unlimited potential for leakage. We are also extremely concerned about the potential for leakage from early divestment from out-of-state coal power, currently possible under safe harbors #2, #7, and #9. We quantify these leakage risks in Section 4.

Across the board, ARB could improve the quality of its approach by carefully delineating the requirements of each safe harbor; this is especially important for determining what ARB means by referring to electricity deliveries that are "necessitated" by some other condition.

Below, we review each safe harbor provision in order:

1. *"Electricity deliveries that are caused by the procurement of electricity eligible to be counted towards and purchased for Renewable Portfolio Standard (RPS) compliance in California."*

   This provision appears to exempt any transaction involving the delivery of qualified renewable electricity to the grid. Thus, any strategy that results in leakage but involves renewable electricity would qualify for a safe harbor. This exemption would permit both cherry picking and facility swapping, as defined by ARB in prior workshop documents. For example, a utility that seeks to purchase qualifying renewable electricity could replace its unspecified imports (cherry picking) or specified imports from coal-fired or natural gas-fired sources (facility swapping).

2. *"Electricity deliveries made for the purpose of compliance with state or federal laws and regulations, including the Emission Performance Standard (EPS) rules established by CEC and the CPUC pursuant to Senate Bill 1368."*

   Like the Renewable Portfolio Standard exemption above, this provision could exempt any transaction that relates to compliance with any state or federal law. What constitutes a delivery "made for the purpose of compliance" is too vague and permits covered entities to claim an extremely broad interpretation of this safe harbor.

   Under such an interpretation, any transaction that includes a regulatory compliance feature would potentially be eligible for a safe harbor, even if it resulted in obvious

[42] California Air Resources Board, supra note 18, § A.4.

and intentional leakage. For example, consider a utility that is bound to purchase electricity from a number of qualifying facilities, and claims that in response, it must shed its contract with a coal plant in order to comply with the requirement that it accept the qualifying facilities' power. The resulting transactions could be described as a compliance strategy, but also result in leakage. Such a broad interpretation would permit cherry picking and facility swapping, as defined by ARB in prior workshop documents.

3. *"Electricity deliveries made for the purpose of compliance with requirements related to maintaining reliable grid operations, such as North American Electric Reliability Corporation (NERC) Reliability Standards, and Reliability Coordinator directives, including the provision of electricity between balancing authorities or load-serving entities when required to alleviate emergency grid conditions."*

   Absent minor reforms, covered entities could abuse this provision, tacking a qualifying safe harbor on to transactions that have no relationship to reliability standards. Specifically, it is possible to conceive of a malicious strategy that is designed to create or take advantage of grid reliability standards to enable resource shuffling. Although arguably a more remote concern than some of the broader loopholes we identify here—though in light of the trading behavior of companies like Enron during the California Electricity Crisis in 2000, perhaps not implausible—it is easily resolved without harming safety or reliability policy motivations. We propose a solution to this problem in Section 5.1.

4. *"Electricity deliveries made for the purpose of compliance with either a judicially approved settlement of litigation or a settlement of a transaction dispute pursuant to the dispute resolution terms and conditions of a contract for reasons other than reducing GHG compliance obligations."*

   The most compelling case for a safe harbor covering settlements is the argument that a flat prohibition on resource shuffling could result in a legal Catch-22 for a covered entity that is party to a settlement negotiation. If a judicial order in a settlement process would result in a covered entity receiving credit for emissions reductions that have not taken place, then that entity would be unable to reconcile the outcome of the settlement and the requirements of the carbon market regulations.

   For example, imagine a dispute over a California's utility's contracts with out-of-state renewable and natural gas-fired power plants. Presume the California utility is, per the terms of the settlement, required to exit the gas contracts and take more of the renewable energy, while its out-of-state counterparty takes the reverse arrangement. As a result, the California utility will report lower emissions, despite a corresponding increase in out-of-state emissions. The California utility will be stuck in a bind: through good faith negotiations, the judicially approved dispute process placed the utility in violation of the basic prohibition on resource shuffling. This seems decidedly unfair to the utility, justifying the outcome provided by this safe harbor provision.

   In our view, however, there is no reason a covered entity should be able to pursue or

achieve resource shuffling through a settlement negotiation. On the other hand, it would not be efficient for a judge to have to anticipate the resource shuffling implications of proposed settlements. Instead, a better solution would be to provide some sort of flexible option that addresses the leakage caused by parties who have legitimate interests in undertaking activities that would normally constitute resource shuffling, such as the resolution of a dispute or litigation. We propose such an option in Section 5.

5. *"Electricity deliveries that are necessitated by the retirement of resources."*

   Retirement is the clearest way to avoid leakage. Although this safe harbor is not necessary (because it is implied by the definition of leakage), it is a helpful restatement of the fundamental policy.

6. *"Electricity deliveries that are necessitated by termination of a contract or divestiture of resources for reasons other than reducing GHG compliance obligation."*

   From our perspective, this is the second most problematic provision for two reasons.

   First, the requirement that the contract termination or divestiture is motivated by reasons other than reducing a compliance obligation is overbroad and vague. Under this provision, it appears that any party could elect to engage in resource shuffling, so long as it could make a colorable argument that it was motivated by something other than the resource shuffling implications of its actions.

   Second, it is not clear which deliveries would be "necessitated" by contract termination or divestiture. Is replacing power deliveries from canceled contracts or divested interests necessary? After all, unilateral or mutually agreeable decisions to terminate or divest are not always necessary; but if these decisions create necessity, does that mean that parties can elect their way into necessity?

   For example, consider a long-term contract between a California utility and an out-of-state coal power plant. Suppose the utility and power plant agree that the utility's long-term interests are best served by it investing more in generation assets the utility owns, rather than contracting with third party providers; as a result, they agree to terminate the contract on mutually agreeable terms. In this instance, the utility might claim that it was not motivated by GHG compliance obligations, and that, as a result of its contract termination, it would be necessary to acquire new renewable or natural gas supplies. In turn, the coal power plant might be able sell its power to other customers (e.g., those who were previously buying the natural gas or renewable power that was subsequently sold to the California utility). Under this safe harbor provision, the utility would appear to be able to avoid the prohibition on resource shuffling, despite the fact that resource shuffling would have actually occurred. Most importantly, the qualifying rationale—the utility's preference for ownership assets—could be replaced with any conceivably plausible business purpose.

   Without specifying any standard for how ARB would review a party's purported motivations, and by permitting such a broad range of potential motivations to satisfy the

safe harbor, this provision is readily subject to gaming by market participants. It is not clear that an enforcement action could proceed against an apparently misleading but colorable excuse under this safe harbor, even if ARB had the resources to show that GHG compliance motivations were significant while all alternative explanations were not.

The implications are particularly significant for out-of-state coal power interests, as we analyze in detail in Section 4.

7. *"Electricity deliveries that are necessitated by early termination of a contract for, or full or partial divestiture of, resources subject to the EPS rules."*

   This safe harbor provision appears to add little more than its predecessor, except that it specifically exempts a subset of termination or divestiture conditions that would already be covered under the previous safe harbor. Again, the implications for leakage from out-of-state are particularly severe.

8. *"Electricity deliveries that are necessitated by expiration of a contract."*

   This is by far the most dangerous safe harbor, providing nearly unlimited potential for manipulation. The provision creates strong economic incentives to write short-term contracts or elective expiration provisions into their electricity contracts, providing a complete liability waiver for any subsequent activity. Surely ARB does not intend to provide an unlimited safe harbor, but the fact remains that this provision can be exploited to achieve nearly any end.

   As with many other provisions, the breadth of the safe harbor turns on what is meant by "necessitated," a term that is especially confusing in the context of a complex market operated in real time. Exactly which electricity deliveries are "necessitated" by a contract's expiration: may a first deliverer of electricity substitute any power it wishes?

9. *"Electricity deliveries pursuant to contracts for short term delivery of electricity with terms of no more than 12 months, for either specified or unspecified power, linked to the selling off of power from, or assigning of a contract for, electricity subject to the EPS rules from a power plant that does not meet the EPS with which a California Electrical Distribution Utility has a contract, or in which a California Electrical Distribution Utility has an ownership share, and based on economic decisions including congestion costs but excluding implicit and explicit GHG costs. In evaluating these short-term deliveries of electricity, ARB will consider the levels of past sales and purchases from similar resources of electricity, among other factors, to judge whether the activity is resource shuffling."*

   Carefully parsing this safe harbor shows that ARB intends to permit any short-term sales of high emission power contracts, especially from out-of-state coal power, if market participants can make a colorable economic argument about the desirability of the transaction without reference to compliance costs.

It is not clear under what circumstances the State could challenge a party claiming a safe harbor here, as to do so would require the State to analyze the entire economic decision-making framework and show that under no circumstances was the decision plausible without the inclusion of implicit or explicit greenhouse gas costs. Imagine trying to bring an enforcement action to prove a negative: the State would have to show that the first deliverer could only have been motivated by the avoided compliance costs, a complex inquiry in the context of interstate electricity markets. We are not convinced this safe harbor is narrowly tailored in such a way as to fairly balance the public's interest in minimizing leakage.

10. *"Short-term transactions and contracts for delivery of electricity with terms of no more than 12 months, or resulting from an economic bid or self-schedule that clears the CAISO day-ahead or real-time market, for either specified or unspecified power, based on economic decisions including implicit and explicit GHG costs and congestion costs, unless such activity is linked to the selling off of power from, or assigning of a contract for, electricity subject to the EPS rules from a power plant that does not meet the EPS with which a California Electricity Distribution Utility has a contract, or in which a California Electricity Distribution Utility has an ownership share, that is not covered under paragraphs 11, 12 or 13 below."*

    In contrast to our objections to the short-term exemptions for contracts arising from power plants that do not meet the EPS, we believe this safe harbor is more sensible. Although we cannot specifically justify why a 12-month limit is the right time horizon, permitting short term trading from EPS-compliant resources makes sense. The requirement that such trading clears the CAISO market seems like a reasonable way of assuring the economic integrity of affected transactions, increasing market certainty without undermining the environmental integrity of the carbon market.

11. *"Electricity deliveries that are necessitated by operational emergencies or transmission or distribution constraints, including constraints caused by the inability to obtain or retain transmission rights, transmission curtailments or outages, or emergencies."*

    Unless a covered entity conspires to abuse this provision, it is entirely appropriate in our view. We anticipate this possibility in our proposal in Section 5, which attempts to provide reliable safe harbors while preserving the possibility of enforcement where evidence explicitly indicates malicious intent.

12. *"Electricity deliveries that are necessitated because a First Deliverer has surplus electricity (more than enough to meet demand) as a result of the First Deliverer being required to take electricity from specific generating units (e.g., electricity contracts with "must-take" or "must-run" provisions.)"*

    Again, unless a covered entity conspires to abuse this provision, it is entirely appropriate in our view. We address this possibility in our proposal in Section 5.

13. *Deliveries of electricity that are required to make up for transmission losses associated with electricity deliveries in California.*

Again, unless a covered entity conspires to abuse this provision, it is entirely appropriate in our view. We address this possibility in our proposal in Section 5.

3.2 The Structure of ARB's Safe Harbor Approach Is Too Permissive.

By providing a list of safe harbor provisions, ARB presumably intends to create a more flexible regulatory regime that responds to stakeholder concerns. Unfortunately, the approach is too blunt as currently envisioned, as must be reformed.

Specifically, the November 2012 Staff Guidance document includes affirmative definitions of what constitutes resource shuffling. These definitions are provided in addition to the long list of safe harbors that exempt certain activities. The Board's proactive efforts here are largely wasted, however, as the Staff Guidance clearly indicates that any transaction falling into a safe harbor is completely exempt from liability.[43] Because the safe harbors are extremely broad, and because the Staff Guidance does not offer a coherent framework for resolving when a trading behavior may qualify for a safe harbor, this structural approach to the regulation is far too permissive.

There is nothing necessarily wrong about a rule structure that offers a reliable liability shield for qualifying activities. Indeed, many stakeholders would presumably place a high value on this outcome. Nevertheless, that approach requires explicit treatment about when a covered entity may claim a safe harbor. By failing to consider the potential for covered entities to include qualifying safe harbor transactions as part of a plan, scheme, or artifice to receive credit for emissions reductions that have not occurred, the Staff Guidance permits malicious trading activity to take advantage of the generous safe harbor provisions in situations that it presumably did not mean to provide them.

As currently written, the Staff Guidance offers no assistance in determining when a single "activity" should be treated as part of a set of "activities" for the purpose of evaluating the resource shuffling rule framework. We believe that the Staff Guidance would permit a covered entity to tack on a qualifying safe harbor activity to an otherwise invalid activity or set of activities, and claim a liability shield on the overall transaction. As a result, the current structure broadens the safe harbor approach far beyond any reasonable outcome.

Unless either ARB either (1) reforms the language indicating that safe harbor provision are completely dominant over the affirmative definitions of resource shuffling, or (2) provides explicit limitations about when a set of activities can be integrated together for the purpose of applying safe harbors, the Staff Guidance can be easily exploited by parties who wish to avoid the basic prohibition on resource shuffling. We address both possibilities in Section 5.

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[43] California Air Resources Board, supra note 18, § A.5 ("Resource shuffling involves substitution . . . when such substitution does not qualify under the 'safe harbors' listed above.").

4. ANALYSIS: LEAKAGE RISK FROM COAL DIVESTMENT

As the previous section demonstrates, ARB's current policy trajectory clearly permits utilities to divest from out-of-state coal power contracts and ownership interests without violating the prohibition on resource shuffling. In this section, we analyze the associated leakage risks that follow from this permissive structure.

Our analysis finds a potential for leakage from out-of-state coal power of up to 186.9 $mmtCO_2$ between 2013 and 2020, an average of 23.4 $mmtCO_2$ per year over the same period (see Table 1). For comparison, the Electric Power Research Institute ("EPRI") projects that cumulative mitigation over the same period must be between 97 and 395 $mmtCO_2e$, depending on the performance of complimentary policies, the supply of carbon offsets, and the use of the State's allowance price reserve account.[44] As a result, the maximum leakage we identify here accounts for between 47% and 193% of the cumulative, economy-wide mitigation required under AB 32.

To bound our analysis of the leakage risks from a permissive resource shuffling rule, we construct two baseline scenarios that reflect different ways of looking at the requirements of California's Emissions Performance Standard, also known as SB 1368. This statute requires state regulators to set a greenhouse gas emissions performance standard equal to combined cycle natural gas power plant emissions.[45] SB 1368 prohibits utilities from entering into a "long-term financial commitment" with facilities that fail to meet this performance standard.[46] Although utilities cannot enter into long-term financial commitments, new or renewed contracts with terms of less than five years are still permitted.[47]

Table 1: Leakage Potential from Early Divestment, 2013 through 2020 ($mmtCO_2e$).

Scenario	Replacement Power	
	Zero-Carbon (e.g., renewable)	**Natural Gas**
Maximum Coal	186.9	107.7
Planned Divestment	127.6	74.1

[44] Electric Power Research Institute, Exploring the Interaction Between California's Greenhouse Gas Emissions Cap-and-Trade Program and Complimentary Emissions Reductions Policies, EPRI Report #3002000298 (March, 2013), available at http://www.epri.com.

[45] Cal. Pub. Utilities Code § 8341(d)-(e).

[46] *Id*. § 8341(a).

[47] *Id*. § 8340(f) (defining long-term financial commitment as a "new ownership investment . . . or a new or renewed contract with a term of five or more years").

Our scenarios explore different plausible strategies for compliance with SB 1368. The first, "Maximum Coal Scenario," represents a future in which all current and projected procurements from coal power continue indefinitely. This scenario represents a situation in which utilities exploit the potential to continue to make short-term contracts with non-compliant facilities beyond their current contract terms. The second, "Planned Divestment Scenario," assumes that utilities will divest from coal power contracts (but not ownership interests) at the end of current contract terms. Although the first scenario best approximates the leakage implications of resource shuffling, we address the second scenario because it arguably represents the political consensus reached under SB 1368, which effectively precludes new long term interests in coal power, and sunsets existing interests—although again, nothing in SB 1368 precludes repeated, short-term extension of existing contracts.

Against each baseline, we calculate the leakage potential if coal power is replaced with zero-carbon energy (e.g., renewables) and natural gas baseload emissions (e.g., natural gas combined cycle, also equivalent to the default emissions level for unspecified power). Covered entities that are permitted to resource shuffle will preferentially substitute any available zero-carbon replacement resources, but may be limited by supply. Our two replacement power options fully bound the potential leakage.

Summary results are provided in Table 1, and we discuss the full methodology in Appendix III. As these calculations demonstrate, the potential for leakage from legacy coal power contracts is quite large. If ARB's regulations on resource shuffling permit utilities to divest from these contracts without ensuring the underlying facilities shut down, this decision will result in as much as 187 mmtCO_2 leaking out of AB 32.

4.1 Comparing Resource Shuffling Leakage Risks to Cumulative Mitigation Expected Under AB 32.

The magnitude of the impacts we identify warrants further explanation and comparison with the cumulative mitigation efforts required under AB 32.

As a threshold matter, it is important to understand that the cap-and-trade targets under AB 32 are expressed in terms of annual emissions levels, not cumulative mitigation requirements. For example, ARB projects that total reductions from the cap-and-trade program must be 22 mmtCO_2e per year below expected business-as-usual emissions in 2020.[48] Translating these annual targets into cumulative mitigation targets requires assumptions about the performance of AB 32 market features, such as the availability of carbon offsets and the use of the allowance price containment reserve ("APCR"), as well as so-called complimentary policies, such as the Low Carbon Fuel Standard or Renewable Portfolio Standard (see Table 2).

[48] *See* Table 1.2-3 in California Air Resources Board, Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document (Aug. 19, 2011), available at http://www.arb.ca.gov/cc/scopingplan/document/final_supplement_to_sp_fed.pdf.

Table 2: Cumulative Mitigation Expected Through 2020, Assuming Maximum Use of Carbon Offsets ($mmtCO_2e$).[49]

Mitigation from Complimentary Policies	Allowance Price Containment Reserve	
	Fully Used	Not Used
As Expected	97.0	219.0
Zero Effect	273.2	395.0

Assuming that complimentary policies meet their targets and that the APCR is fully exhausted, the Electric Power Research Institute estimates that cumulative abatement through 2020 will total 97.0 $mmtCO_2e$. As a result, the maximum potential for leakage we estimate here is 192% of the cumulative mitigation expected under the best-case scenario for AB 32 implementation.

If ARB continues its permissive approach to resource shuffling, however, it is unlikely that the APCR will be fully exploited. Allowances placed in the APCR are available only if carbon market prices rise quickly; but if utilities can use resource shuffling to avoid compliance obligations, it is likely that prices will remain below the APCR threshold. In this situation, again assuming complementary policies meet their target, EPRI estimates that cumulative mitigation through 2020 will be 219.0 $mmtCO_2e$. As a result, the maximum potential for leakage we estimate here is 85% of the cumulative mitigation expected under this scenario.

It is also possible that the mitigation expected under complimentary policies falls short, due to legal challenges, ineffective policy implementation, or other unforeseen problems. To estimate the worst-case scenario, EPRI estimates the cumulative mitigation required if complementary policies do not deliver any mitigation benefits. In this case, the price of carbon under the cap-and-trade market is likely to be high, and the APCR is likely to be used. With full use of the APCR and zero mitigation from complementary policies, cumulative mitigation is projected to be 273.2 $mmtCO_2e$. As a result, the maximum potential for leakage we estimate here is 68% of the cumulative mitigation expected under this scenario.

Finally, if complementary policies fail, but AB 32 market prices stay below the APCR threshold, cumulative mitigation through 2020 would need to reach 395.0 $mmtCO_2e$. As a result, the maximum potential for leakage we estimate here is 47% of the cumulative mitigation expected under this scenario.

[49] See Figures 6-1 through 6-3 in EPRI, supra note 44. EPRI assumes that the maximum number of allowances that can be used for compliance under AB 32 are available. In other words, the cumulative mitigation projections are what is needed *after* covered entities fully exploit the potential for carbon offsets.

As this discussion illustrates, estimating the cumulative mitigation required under AB 32 requires analytical assumptions about the impact of complementary policies and use of allowances in the APCR. For additional context, Table 3 presents a full comparison of all leakage risk scenarios evaluated in this report against the cumulative mitigation scenarios analyzed by EPRI.

Table 3: Maximum Leakage Risk As a Percentage of Cumulative Mitigation Expected Under AB 32 Through 2020 (mmtCO_2e).

Resource Shuffling Leakage Risk Scenario	*Complementary Policies' Effects:* / *APCR Use:*	**Cumulative Mitigation Scenario**[50]			
		None / None	None / Full	Full / None	Full / Full
Maximum Coal	Zero-carbon replacement	47%	68%	85%	193%
	Natural gas replacement	27%	39%	49%	111%
Planned Divestment	Zero-carbon replacement	32%	47%	58%	132%
	Natural gas replacement	19%	27%	34%	76%

Although a comprehensive comparison of leakage risks from resource shuffling against cumulative mitigation under AB 32 requires a comparison across multiple variables, one clear pattern emerges: the more successful California's comprehensive climate policy becomes, the more a lax regulation on resource shuffling will undermine the cap-and-trade market.

5. PROPOSED SOLUTION

We appreciate that ARB faces a difficult task in designing a prohibition on resource shuffling that minimizes leakage, creates market certainty, works in harmony with existing state energy policies, and treats in-state and out-of-state electricity providers equally.

[50] For a more complete explanation of the cumulative mitigation requirements under AB 32, *see* Figures 6-1 through 6-3 in EPRI, supra note 44.

Although this is a tall order, we believe it is possible and offer a fully developed proposal that strikes a different balance.

Our proposed solution can be found in the appendices to this report. Appendix I presents a draft regulatory text that is compared against the current text of the Staff Guidance document, showing the deletions and additions we propose. We also present our proposed regulatory text in its original form in Appendix II.[51]

Notably, our proposal focuses on minimizing leakage, but also provides a number of provisions to increase market certainty and compliance flexibility for covered entities. Our reforms fall into three categories:

- **Clarifying the logic of the compliance regime.** Whatever one believes about the appropriate mix of safe harbors, the basic structure of the regulatory system for resource shuffling is unclear. We expand upon the elements of compliance and enforcement, specifying under which conditions covered entities may safely rely on safe harbor provisions to avoid liability. By providing specific requirements for each element, our proposal increases regulatory certainty.

- **Closing overbroad safe harbors.** Based on the concerns expressed in Section 3, we eliminate the broadest safe harbors. Additional closures are possible due to the compliance flexibility options we introduce.

- **Increasing compliance flexibility.** A strong prohibition on resource shuffling creates the possibility of a legal catch-22, in which a covered entity is required to do something that is also prohibited as resource shuffling. We introduce a flexible compliance mechanism that allows covered entities to elect to remain responsible for any leakage. This option allows us to close some of the more complex safe harbors that address conflicts between AB 32 and other state energy policies, especially those related to coal power.

We evaluate how our proposal achieves each of these goals in the next sub-sections.

5.1 Section (A) Clarifies the Compliance Regime.

Fundamentally, we believe that the relationship between safe harbors and the underlying prohibition on resource shuffling must be clarified. The first element of our proposal is designed to provide this clarity while working with whatever mixture of policy goals ARB ultimately adopts in a revised rulemaking. In addition, the rule structure should encompass the possibility that multiple transactions constitute a pattern of resource shuffling.

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[51] Although our proposal is written to expand upon the definition of resource shuffling in Cal. Code Regs., tit. 17, § 95802(a)(252), it is easily adapted to the formatting ARB proposed in its July 2013 draft regulations. Specifically, our Section A could remain with the main definition in § 95802(a)(252), while our Sections B through D could be moved to the location where ARB has placed its safe harbor language, § 95852(b)(2).

Section (A) of our proposal implements these goals:

- **Section (A)(i).** We begin by expanding the definition of a "plan, scheme, or artifice" to encompass either single or multiple transactions, which we call an "integrated series of transactions." In order to be considered part of an integrated series of transactions, each transactional step must be "reasonably" related to the goal of "receiving credit based on emissions reductions that have not occurred." Our goal here is to maintain the terminology ARB has already selected in its original regulations, clarifying the scope of the prohibition and providing clear metrics for how stakeholders, regulators, and courts should construct the definition.

- **Section (A)(ii).** Next, we exempt electricity deliveries due to safety or reliability concerns from being included in any analysis of integrated series of transactions. This provision provides a liability shield to any covered entity that responds to safety or reliability concerns. The only possible liability would occur if the entity "intended to create, manipulate, or exploit" these situations. By including intention as a required element of liability here, the provision provides a broad liability shield that can only be overcome with specific evidence of wrongdoing.

- **Section (A)(iii).** This paragraph is a crucial addition to the text, as it constructs the relationship between the liability shield of the safe harbors and the underlying prohibition on resource shuffling. It also specifies the burden of proof in an enforcement action. The net effect of these construction principles is to provide a reliable means for covered entities to establish and rely upon safe harbors, increasing market certainty and clarifying enforcement authority.

    - **Section (A)(iii)(1).** In order to provide market certainty, this provision offers a liability shield to any integrated series of transactions that includes an activity qualifying for a safe harbor for all but one safe harbor. This means that if a covered entity can assert its safe harbor, no enforcement action is possible related to an integrated set of activities that reasonably includes that safe harbor activity. The burden is on the enforcing party to prove that the safe harbor is not reasonably related to other activities in the integrated series of transactions. Thus, covered entities can comply with the regulation by assuring themselves that they have attained the standards for one of the safe harbors, without being concerned about potential liability due to regulatory uncertainty. The regulator may still bring an enforcement action if overwhelming evidence supports its case.

    - **Section (A)(iii)(2).** The burden of proof is reversed for one safe harbor, which we introduce later in the proposal to increase compliance flexibility. This safe harbor exempts individual activities that would prospectively result in less than some maximum specified amount of leakage. The burden of proof in an enforcement action here is reversed because the purpose of the new safe harbor is to exempt small transactions from enforcement liability; yet the potential for a covered entity to abuse this generous provision is significant. The goal with this reversed burden of proof should be

understood only to provide ample enforcement authority if a covered entity splits a single, high-leakage transaction into multiple, low-leakage activities. A party that asserts this safe harbor in good faith should have no trouble establishing its good intentions with minimal transaction costs.

- **Section (A)(iv).** Finally, this provision affirms that written contracts constitute evidence of "a plan, scheme, or artifice." Contracts can also establish the basis of the parties' intentions, according to an objective standard: contracts indicate the intention to create the consequences that a qualified expert would reasonably expect from the contracts. This provision enables enforcement actions on the basis of contractual evidence, both upholding and streamlining the requirement that enforcement demonstrate malicious intent.

5.2 Section (B) Closes the Broadest Safe Harbors.

Section (B) of our proposal implements these goals:

- **Close the Broadest Safe Harbors:**

    - **Sections (B)(vi) and (viii).** These two safe harbors are so broad that a creative lawyer could fit nearly any transaction could fit through them, completely negating the prohibition on resource shuffling. Their reform (and, we argue, elimination) is a necessary prerequisite to meeting the statutory requirement of minimizing leakage.

    - **Sections (ii), (vii), (ix).** As Section 4 of this report illustrates, the leakage risk from out-of-state coal power is significant and problematic. We recommend eliminating these provisions, which are no longer necessary in light of Section (D) of our proposal.

    - **Sections (B)(i), (iv).** These safe harbors appear to anticipate situations in which covered entities potentially face a Catch-22, with a strong ban on resource shuffling preventing an entity from engaging in an activity that another law or judicial settlement compels. We are sympathetic to this argument, but with the introduction of the reverse offset in Section (D), we believe these concerns are no longer as compelling.

      In our view, there is no economic reason to justify exempting renewable energy transactions from the resource shuffling concern, as Section (B)(i) could be used to facilitate "cherry picking" or "facility swapping." Similarly, there is no economic reason to justify exempting a settlement from the prohibition on resource shuffling — except for the concern that it would be expensive and time intensive for judges or counterparties to anticipate the resource shuffling consequences. Our reverse offset concept relieves judges and counterparties of this burden, and provides a covered entity with a clear escape mechanism from a settlement that results in resource shuffling.

- **Add New Safe Harbors.** Finally, we add two new safe harbor provisions to expand compliance flexibility for covered entities.

    - **Section (B)(xiv) [redline version]; Section (B)(vii) [clean version].** This new safe harbor explicitly exempts any transaction in which the net compliance obligation across the transacting parties does not decrease. This provision provides for the future linkage of California's carbon market with other jurisdictions, specifically exempting transactions where the compliance obligation passes from one party to another, but never disappears. To prevent abuse of this exemption, the provision explicitly disallows application of the safe harbor liability shield in Section (A)(iii) to an integrated series of transactions, unless each transaction independently qualifies for one or more safe harbors. In other words, covered entities cannot use this new safe harbor as a "get out of jail free" card to avoid liability for leakage from related transactions.

    - **Section (B)(xv) [redline version]; Section (B)(viii) [clean version].** The second new safe harbor sets a maximum leakage threshold, below which any transaction is automatically exempt from the basic definition of resource shuffling. Because we recommend closing a number of overly broad safe harbors, we recognize that some stakeholders may find our proposal to be too burdensome, especially for smaller transactions. As a compromise, we suggest that ARB identify a threshold amount of leakage that constitutes a "minimal" level, consistent with the statutory requirements. Note that we reverse the burden of proof for covered entities relying on this safe harbor, in order to protect against the possibility that a covered entity might translate a single, high-leakage transaction into multiple, low-leakage transactions that each qualify for this safe harbor. Fundamentally, the purpose is to exempt small trades, not to encourage new loopholes.

5.3 Section (C) Defines Specific Categories of Resource Shuffling.

Section (C) of our proposal implements these goals:

- **Section (C)(i).** This provision essentially aims to prevent "facility swapping," as defined by ARB in previous workshop documents. We retain it, removing only the condition that the facility swapping be done in order to reduce a compliance obligation. It does not matter what motivated the leakage; even if ARB wished to set a definition that applied only when the transfer was caused by compliance cost considerations, enforcement would be almost impossible. Because the number of facilities that do not meet the Emissions Performance Standard is limited, we believe it is better to set a stricter limit; the small number of facilities that are affected by this rule limits the risks of increased market uncertainty.

- **Section (C)(ii).** It is not immediately clear that Section (C)(ii) is necessary given the language in Section (C)(i), but we retain the approach put forward by ARB for

consistency. As with Section (C)(i), we remove the condition that the facility swapping be done in order to reduce a compliance obligation. We add in language limiting this definition by excluding transfers to parties who face compliance obligations in carbon markets with which the California market has officially been linked.

- **Section (C)(iii).** This provision affirms the prohibition on "laundering," as defined by prior ARB workshop documents. We exclude activities from the definition that are "merely incidental" to "otherwise economically sound transactions," excluding implicit and explicit greenhouse gas prices. This exclusion signals the regulator's intention not limit use of the affirmative definition, without requiring an enforcement action to prove that the offending activity or activities was motivated by avoiding compliance costs. It provides an opportunity for a covered entity to demonstrate that the alleged resource shuffling was part of an economically sound activity and was not the purpose or reasonably intended effect of a broader series of transactions.

- **Section (C)(iv).** This provision affirms the prohibition on "cherry picking," as defined by prior ARB workshop documents. We adopt the same approach to defining the scope of the affirmative definition as in Section (C)(iii).

5.4 Section (D) Increases the Compliance Flexibility.

This section implements a new market-based compliance option that is designed to expand regulated entities' ability to comply with a strong prohibition on resource shuffling. We call this new instrument a "reverse offset."

The name intentionally reflects a close parallel with traditional offsets. A carbon offset protocol awards credit for emissions reductions that occur outside the scope of a carbon market's jurisdiction. In contrast, a reverse offset retains environmental liability for activities that shift emissions out of the carbon market, without reducing them.

Legally, the reverse offset acts to split the environmental liabilities from the remaining property right attributes of a transaction that would otherwise constitute resource shuffling. A covered entity that elects a reverse offset retains that liability, and is permitted to do as it pleases with the remaining property rights. Because the covered entity retains the emissions liability in any transfer, there is no increase in emissions outside of the state's market, and thus, no leakage. Similarly, there is no reduction in emissions reporting, and thus, no resource shuffling.

Economically, the reverse offset provides clear and accurate incentives to all covered entities. Because an electing entity retains an environmental liability that it must satisfy with allowances, the reverse offset prices leakage at the market price for allowances. Like an offset, the reverse offset harmonizes the cost of compliance using market forces.

In policy terms, the reverse offset provides a middle ground between strict command-and-control regulation and a retreat from enforcing the prohibition on resource shuffling. By design, the reverse offset accommodates multiple, previously conflicting policy goals.

It allows covered entities to divest from coal, increase renewable energy while exporting legacy fossil fuel-based electricity, and engage in any profitable activity. Its only effect is to price the leakage that would otherwise occur. Environmentally, the reverse offset protects against leakage because it allows ARB to close overbroad safe harbors.

Unlike previous proposals that would have separated the greenhouse emissions liability from all other attributes in electricity contracts,[52] the administrative costs of the reverse offset would be more modest. There is no need to track both attributes separately for all contracts—only for those that covered entities elect to separate to avoid resource shuffling. Furthermore, ARB would not have to track the emissions attributes; our proposal would require electing covered entities to report the supplemental emissions, until such time as the underlying facility shuts down or becomes the compliance obligation of another covered entity.

Section (D) of our proposal implements the reverse offset:

- **Section (D)(i).** A covered entity making an election under this section must notify ARB in writing, specifying the details of the transaction.

- **Section (D)(ii).** A covered entity making an election under this section agrees to assume continued compliance obligations for the resource that is transferred outside of the coverage of AB 32. The ongoing compliance obligation is defined as the difference between the higher emitting resource that was transferred away and the newer resource that replaced it. Thus, if a utility swapped a coal contract for a gas contract, holding total MWh constant, it would continue to report total compliance obligations equal to the coal emissions levels. As usual, it would report its regular compliance obligations, equal to the natural gas emissions; in addition, it would report the difference between the old coal emissions and the new natural gas emissions, which brings the total back to the original level of emissions. This section also sets out the data reporting requirements for the new compliance obligations, requiring a consistent estimation or reporting methodology, unless subsequent operation of the generating resource transferred outside of AB 32 justifies new methods or data. This reporting requirement compels the covered entity to report accurate emissions information.

- **Section (D)(iii).** A covered entity making an election under this section assumes its new compliance obligations until one of two terminal conditions. The first terminal condition occurs when the transferred resource retires. The second terminal condition occurs when another entity accepts liability for the transferred resource, either within the California carbon market, or in another market with which the California carbon market has been linked. Essentially, this requires the

[52] For an overview of fully unbundled emissions and electricity contracts, s*ee* Hobbs, B.F., J. Bushnell and F. Wolak, *Upstream vs. Downstream CO_2 Trading: A Comparison for the Electricity Context*. University of California, Berkeley, Energy Institute @ Haas Working Paper #203 (March 2010), §§ 6-7, *also published as* Hobbs, B.F., J. Bushnell and F. Wolak (2010), Upstream vs. downstream CO_2 trading: A comparison for the electricity context. *Energy Policy* 38: 3632-3643.

covered entity making an election under this section to assume continued responsibility for the emissions that would otherwise leak out of AB 32, until such time as the leakage ends—either because the emissions end, or because the liability falls on another party within the capped system. Both conditions represent the end of the potential for leakage, and thus serve as clear bases for terminating the elective liability concept under the reverse offset.

6. CONCLUSIONS

We review ARB's approach to banning resource shuffling and find that the safe harbors developed in the Staff Guidance and codified in the July 2013 draft amendments are so broad as to overwhelm the rule. We find that almost all transactions can be structured to fit into several of the broadest provisions.

Furthermore, the safe harbors clearly exempt early divestment from out-of-state coal power contracts from the prohibition on resource shuffling. We present the most detailed analysis of the leakage that would result from this policy decision, estimating leakage risks of up to 187 mmtCO_2 through 2020. Compared against expected cumulative mitigation efforts in the cap-and-trade market, this leakage risk accounts for between 47% and 193% of total compliance required under AB 32. Leakage from the broadest safe harbors could be even higher.

This policy trajectory does not satisfy the statutory requirement that ARB minimize leakage in its carbon market regulations. The current approach is also economically unjustified in light of the fact that ARB has already provided free allocations to utilities on the basis of their future greenhouse gas emissions and expected compliance costs. We believe that a decision to permit significant leakage through resource shuffling undermines the economic and environmental integrity of what has already become the most important carbon market in the world, and call on ARB to revise its approach.

In addition to documenting our concerns about the current policy trajectory, we provide a fully developed set of reforms that ARB might consider in an upcoming rulemaking. A subset of these reforms is designed to increase market certainty and improve the enforceability of the safe harbor approach, whatever perspective ARB adopts on the leakage risks we identify. Based on our concerns about leakage, we propose closing a number of safe harbors. Some of the provisions are simply too broad to be included in a robust final rule. Others pose reduced (though still substantial) risks of leakage; they also become unnecessary in light of our suggested reforms.

Our suggested reforms are built around a new "reverse offset" concept, under which covered entities can elect to retain greenhouse gas emissions liability in any transaction that would otherwise constitute resource shuffling. This new option provides additional compliance flexibility, permitting ARB to close safe harbors while still permitting covered entities to engage in a wide variety of market-based transactions. Although the reverse offset option acts to keep compliance costs on covered entities, this outcome is a fair and reasonable burden to bear because utilities that would face costs under our pro-

posed rule structure have already been fully compensated by ARB's existing allowance allocation process.

Although we designed our proposal to address the goal of minimizing leakage under AB 32, we believe that the end result could reduce the risk of litigation over preemption issues. By reducing an opaque set of rules that require significant interpretation into a clear, narrowly focused and mechanistic regulatory text, we anticipate that any reviewing court would be less likely to find grounds on which to preempt ARB's authority.

Appendix I: Regulatory Proposal, Redline Edit Version

Key: Original text from regulations and Staff Guidance in black.

New additions proposed here in blue with underlining.

~~Suggested deletions in red with strikethrough.~~

Cal. Code Regs., tit. 17, § 95802(a)(250) — Resource Shuffling

(A) General definition

"Resource shuffling" means any plan, scheme, or artifice to receive credit based on emissions reductions that have not occurred, involving the delivery of electricity to the California grid.

(i) A plan, scheme, or artifice may consist of either (1) a single transaction, or (2) an integrated series of transactions that are reasonably related to a covered entity receiving credit based on emissions reductions that have not occurred.

(ii) For the purpose of establishing liability under this definition, an integrated series of transactions does not include any transaction that is necessitated by a safety concern or emergency condition, unless an entity that is party to the integrated series of transactions intended to create, manipulate, or exploit the safety concern or emergency condition as part of a plan, scheme, or artifice to receive credit for emissions reductions that have not occurred.

(iii) Any integrated series of transactions that includes an activity that qualifies as a safe harbor under subsection (B) below does not constitute resource shuffling, unless either of the following conditions hold:

(1) The purported safe harbor activity is not reasonably related to any otherwise-valid purpose of the other activities in the integrated series of transactions. In order to establish the existence of resource shuffling despite the presence of a valid safe harbor, any party brining an enforcement action or other legal claim bears the burden of establishing that the valid safe harbor is not reasonably related to an integrated series of transactions that would independently constitute resource shuffling; or,

(2) The integrated series of transactions involves the intentional re-arrangement of a transaction that exceeds the leakage threshold specified in subsection (B)(xv) into multiple transactions that qualify for the safe harbor in subsection (B)(xv). In order to satisfy the safe harbor conditions specified in subsection (B)(xv), a party against whom an enforcement action or other legal claim has been brought must establish a valid purpose to the re-arrangement of the larger transaction for which the total leakage exceeds the threshold in subsection (B)(xv). Receiving credit based on emissions reduc-

tions that have not occurred is not a valid purpose, nor is any economic benefit that follows from such credit.

(iv) Without limiting other means of establishing a plan, scheme, or artifice under this section, the plain meaning or reasonably expected effects of (1) a contract or (2) a series of contracts that are part of an integrated series of transactions establishes that the parties to that contract or series of contracts intentionally engaged in a plan to undertake the activities specified therein, and knowingly intended any consequences that a person with relevant subject matter expertise would reasonably expect to follow from those activities. Furthermore, the actions of and evidence related to the mental state of agents who have authority to act on behalf of covered entities will constitute the actions of or evidence related to the mental state of that entity.

(B) "Safe harbor" activities that are not resource shuffling

~~Effective January 1, 2013, t~~The following ~~substitutions of electricity deliveries from a higher emission resource with electricity deliveries from a lower emission resource~~ transaction types shall not constitute resource shuffling as defined by Section 95802(a)(250):

~~(i) Electricity deliveries that are caused by the procurement of electricity eligible to be counted towards and purchased for Renewable Portfolio Standard (RPS) compliance in California.~~

~~(ii) Electricity deliveries made for the purpose of compliance with state or federal laws and regulations, including the Emission Performance Standard (EPS) rules established by CEC and the CPUC pursuant to Senate Bill 1368.~~

(iii) Electricity deliveries made for the purpose of compliance with requirements related to maintaining reliable grid operations, such as North American Electric Reliability Corporation (NERC) Reliability Standards, and Reliability Coordinator directives, including the provision of electricity between balancing authorities or load-serving entities when required to alleviate emergency grid conditions.

~~(iv) Electricity deliveries made for the purpose of compliance with either a judicially approved settlement of litigation or a settlement of a transaction dispute pursuant to the dispute resolution terms and conditions of a contract for reasons other than reducing GHG compliance obligations.~~

(v) Electricity deliveries that ~~are necessitated by~~ directly replace those that no longer occur due to the retirement of resources.

~~(vi) Electricity deliveries that are necessitated by termination of a contract or divestiture of resources for reasons other than reducing GHG compliance obligation.~~

~~(vii) Electricity deliveries that are necessitated by early termination of a contract for, or full or partial divestiture of, resources subject to the EPS rules.~~

~~(viii) Electricity deliveries that are necessitated by expiration of a contract.~~

~~(ix) Electricity deliveries pursuant to contracts for short term delivery of electricity with terms of no more than 12 months, for either specified or unspecified power, linked to the selling off of power from, or assigning of a contract for, electricity subject to the EPS rules from a power plant that does not meet the EPS with which a California Electrical Distribution Utility has a contract, or in which a California Electrical Distribution Utility has an ownership share, and based on economic decisions including congestion costs but excluding implicit and explicit GHG costs. In evaluating these short term deliveries of electricity, ARB will consider the levels of past sales and purchases from similar resources of electricity, among other factors, to judge whether the activity is resource shuffling.~~

(x) Short-term transactions and contracts for delivery of electricity with terms of no more than 12 months, or resulting from an economic bid or self-schedule that clears the CAISO day-ahead or real-time market, for either specified or unspecified power, based on economic decisions including implicit and explicit GHG costs and congestion costs, unless such activity is linked to the selling off of power from, or assigning of a contract for, electricity subject to the EPS rules from a power plant that does not meet the EPS with which a California Electricity Distribution Utility has a contract, or in which a California Electricity Distribution Utility has an ownership share, that is not covered under ~~paragraphs 11, 12 or 13~~ subsections [(B)(xi) through (B)(xiii)] below.

(xi) Electricity deliveries that are necessitated by operational emergencies or transmission or distribution constraints, including constraints caused by the inability to obtain or retain transmission rights, transmission curtailments or outages, or emergencies.

(xii) Electricity deliveries that are necessitated because a First Deliverer has surplus electricity (more than enough to meet demand) as a result of the First Deliverer being required to take electricity from specific generating units (e.g., electricity contracts with "must-take" or "must-run" provisions~~.~~).

(xiii) ~~Deliveries of e~~Electricity deliveries that are required to make up for transmission losses associated with electricity deliveries in California.

(xiv) Transactions in which the net compliance obligations across all transacting parties do not decrease. For the purposes of calculating net compliance obligations, this includes obligations within the California carbon market as well as obligations within other jurisdictions with which the California market has been officially linked. Notwithstanding the provisions of Section (A)(iii), his safe harbor cannot be applied to an integrated series of transactions, unless each related transaction independently qualifies for one or more safe harbors.

(xv) Transactions in which the quantity of emissions that could prospectively qualify as leakage is less than [**A MAXIMUM THRESHOLD**].

(C) Activities that constitute resource shuffling

The following ~~two~~ activities are identified by ARB as resource shuffling:

(i) Substituting relatively lower emission electricity to replace electricity generated at a high emission power plant procured by a First Deliverer under a long-term contract or ownership arrangement, when the power plant does not meet California's Emissions Performance Standard regulations~~, and the substitution is made in order to reduces a First Deliverer's compliance obligation~~.

(ii) Assigning a long-term contract for high emission electricity specified in subsection (C)(i)~~A.5 (1) directly above~~ to a third party such that the assignment results in a reduction in the net compliance obligations across both parties~~, for the purpose of reducing a compliance obligation~~. For the purposes of calculating net compliance obligations, this includes obligations within the California carbon market as well as obligations with other jurisdictions with which the California market has been officially linked.

(iii) Replacing specified power with deliveries of unspecified power, such that the replacement results in a reduction of a covered entity's compliance obligations and when the replacement is not merely incidental to an otherwise economically sound transaction or integrated series of transactions, excluding implicit and explicit greenhouse gas prices.

(iv) Replacing unspecified power with deliveries of specified, low-emitting power, such that the replacement results in a reduction of a covered entity's compliance obligations and when the replacement is not merely incidental to an otherwise economically sound transaction or integrated series of transactions, excluding implicit and explicit greenhouse gas prices.

(D) Voluntary assumption of leakage

Any covered entity that engages in a transaction or integrated series of transactions that would normally constitute resource shuffling may make an election under this subsection, in which case that transaction or integrated series of transactions will not constitute resource shuffling.

(i) A covered entity making an election under this subsection must notify the Air Resources Board in writing before it undertakes a transaction or integrated series of transactions, specifying the nature of the transaction or integrated series of transactions.

(ii) A covered entity making an election under this subsection will assume the compliance obligations that correspond to the compliance obligations that entity faced before undertaking the affected transaction or integrated series of transactions. After executing the transaction or integrated series of transactions, each affected entity will report its adjusted greenhouse gas emissions as it would if it had not made an election, with one supplemen-

tal term: an additional source of greenhouse gas emissions equal to the difference between the greenhouse gas emissions associated with the transfers away from the covered entity and the greenhouse gas emissions associated with transfers to the covered entity, pursuant to the methods established by the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, as set forth in title 17, California Code of Regulations, chapter 1, subchapter 10, article 2 (commencing with section 95100). This supplemental reporting should match the methods and data used in previous reporting affecting the transferred resource, unless subsequent operation of the transferred resource justifies the use of new methods or data.

(iii) A covered entity making an election under this subsection assumes its historical compliance obligation under subsection (D)(ii) until such time as (1) the resource transferred away from the covered entity retires, or (2) another covered entity accepts liability for the same resource in the California carbon market, or another with which the California market has been formally linked. At such time, the covered entity that made the original election under this subsection may file a written notice to the Air Resources Board specifying the applicable circumstances. Once a true and accurate filing has been made, the covered entity will no longer be responsible for its historical compliance obligations from that point forward, and may cease to report its historical emissions pursuant to subsection (D)(ii).

Appendix II: Regulatory Proposal, Clean Version

Note: All edits from Appendix I are adopted here.

Cal. Code Regs., tit. 17, § 95802(a)(250) — Resource Shuffling

(A) General definition

"Resource shuffling" means any plan, scheme, or artifice to receive credit based on emissions reductions that have not occurred, involving the delivery of electricity to the California grid.

(i) A plan, scheme, or artifice may consist of either (1) a single transaction, or (2) an integrated series of transactions that are reasonably related to a covered entity receiving credit based on emissions reductions that have not occurred.

(ii) For the purpose of establishing liability under this definition, an integrated series of transactions does not include any transaction that is necessitated by a safety concern or emergency condition, unless an entity that is party to the integrated series of transactions intended to create, manipulate, or exploit the safety concern or emergency condition as part of a plan, scheme, or artifice to receive credit for emissions reductions that have not occurred.

(iii) Any integrated series of transactions that includes an activity that qualifies as a safe harbor under subsection (B) below does not constitute resource shuffling, unless either of the following conditions hold:

(1) The purported safe harbor activity is not reasonably related to any otherwise-valid purpose of the other activities in the integrated series of transactions. In order to establish the existence of resource shuffling despite the presence of a valid safe harbor, any party brining an enforcement action or other legal claim bears the burden of establishing that the valid safe harbor is not reasonably related to an integrated series of transactions that would independently constitute resource shuffling; or,

(2) The integrated series of transactions involves the intentional re-arrangement of a transaction that exceeds the leakage threshold specified in subsection (B)(xv) into multiple transactions that qualify for the safe harbor in subsection (B)(xv). In order to satisfy the safe harbor conditions specified in subsection (B)(xv), a party against whom an enforcement action or other legal claim has been brought must establish a valid purpose to the re-arrangement of the larger transaction for which the total leakage exceeds the threshold in subsection (B)(xv). Receiving credit based on emissions reductions that have not occurred is not a valid purpose, nor is any economic benefit that follows from such credit.

(iv) Without limiting other means of establishing a plan, scheme, or artifice under this section, the plain meaning or reasonably expected effects of (1) a contract or (2) a series of contracts that are part of an integrated series of transactions establishes that the parties to that contract or series of contracts intentionally engaged in a plan to undertake the activities specified therein, and knowingly intended any consequences that a person with relevant subject matter expertise would reasonably expect to follow from those activities. Furthermore, the actions of and evidence related to the mental state of agents who have authority to act on behalf of covered entities will constitute the actions of or evidence related to the mental state of that entity.

(B) "Safe harbor" activities that are not resource shuffling

The following transaction types shall not constitute resource shuffling as defined by Section 95802(a)(250):

(i) Electricity deliveries made for the purpose of compliance with requirements related to maintaining reliable grid operations, such as North American Electric Reliability Corporation (NERC) Reliability Standards, and Reliability Coordinator directives, including the provision of electricity between balancing authorities or load-serving entities when required to alleviate emergency grid conditions.

(ii) Electricity deliveries that directly replace those that no longer occur due to the retirement of resources.

(iii) Short-term transactions and contracts for delivery of electricity with terms of no more than 12 months, or resulting from an economic bid or self-schedule that clears the CAISO day-ahead or real-time market, for either specified or unspecified power, based on economic decisions including implicit and explicit GHG costs and congestion costs, unless such activity is linked to the selling off of power from, or assigning of a contract for, electricity subject to the EPS rules from a power plant that does not meet the EPS with which a California Electricity Distribution Utility has a contract, or in which a California Electricity Distribution Utility has an ownership share, that is not covered under subsections [(B)(iv) through (B)(vi)] below.

(iv) Electricity deliveries that are necessitated by operational emergencies or transmission or distribution constraints, including constraints caused by the inability to obtain or retain transmission rights, transmission curtailments or outages, or emergencies.

(v) Electricity deliveries that are necessitated because a First Deliverer has surplus electricity (more than enough to meet demand) as a result of the First Deliverer being required to take electricity from specific generating units (e.g., electricity contracts with "must-take" or "must-run" provisions).

(vi) Electricity deliveries that are required to make up for transmission losses associated with electricity deliveries in California.

(vii) Transactions in which the net compliance obligations across all transacting parties do not decrease. For the purposes of calculating net compliance obligations, this includes obligations within the California carbon market as well as obligations within other jurisdictions with which the California market has been officially linked. Notwithstanding the provisions of Section (A)(iii), this safe harbor cannot be applied to an integrated series of transactions, unless each related transaction independently qualifies for one or more safe harbors.

(viii) Transactions in which the quantity of emissions that could prospectively qualify as leakage is less than [**A MAXIMUM THRESHOLD**].

(C) Activities that constitute resource shuffling

The following activities are identified by ARB as resource shuffling:

(i) Substituting relatively lower emission electricity to replace electricity generated at a high emission power plant procured by a First Deliverer under a long-term contract or ownership arrangement, when the power plant does not meet California's Emissions Performance Standard regulations.

(ii) Assigning a long-term contract for high emission electricity specified in subsection (C)(i) to a third party such that the assignment results in a reduction in the net compliance obligations across both parties. For the purposes of calculating net compliance obligations, this includes obligations within the California carbon market as well as obligations with other jurisdictions with which the California market has been officially linked.

(iii) Replacing specified power with deliveries of unspecified power, such that the replacement results in a reduction of a covered entity's compliance obligations and when the replacement is not merely incidental to an otherwise economically sound transaction or integrated series of transactions, excluding implicit and explicit greenhouse gas prices.

(iv) Replacing unspecified power with deliveries of specified, low-emitting power, such that the replacement results in a reduction of a covered entity's compliance obligations and when the replacement is not merely incidental to an otherwise economically sound transaction or integrated series of transactions, excluding implicit and explicit greenhouse gas prices.

(D) Voluntary assumption of leakage

Any covered entity that engages in a transaction or integrated series of transactions that would normally constitute resource shuffling may make an election under this subsection, in which case that transaction or integrated series of transactions will not constitute resource shuffling.

(i) A covered entity making an election under this subsection must notify the Air Resources Board in writing before it undertakes a transaction or inte-

grated series of transactions, specifying the nature of the transaction or integrated series of transactions.

(ii) A covered entity making an election under this subsection will assume the compliance obligations that correspond to the compliance obligations that entity faced before undertaking the affected transaction or integrated series of transactions. After executing the transaction or integrated series of transactions, each affected entity will report its adjusted greenhouse gas emissions as it would if it had not made an election, with one supplemental term: an additional source of greenhouse gas emissions equal to the difference between the greenhouse gas emissions associated with the transfers away from the covered entity and the greenhouse gas emissions associated with transfers to the covered entity, pursuant to the methods established by the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, as set forth in title 17, California Code of Regulations, chapter 1, subchapter 10, article 2 (commencing with section 95100). This supplemental reporting should match the methods and data used in previous reporting affecting the transferred resource, unless subsequent operation of the transferred resource justifies the use of new methods or data.

(iii) A covered entity making an election under this subsection assumes its historical compliance obligation under subsection (D)(ii) until such time as (1) the resource transferred away from the covered entity retires, or (2) another covered entity accepts liability for the same resource in the California carbon market, or another with which the California market has been formally linked. At such time, the covered entity that made the original election under this subsection may file a written notice to the Air Resources Board specifying the applicable circumstances. Once a true and accurate filing has been made, the covered entity will no longer be responsible for its historical compliance obligations from that point forward, and may cease to report its historical emissions pursuant to subsection (D)(ii).

Appendix III: Leakage Risk Methodology

Note: This appendix provides supporting information for the conclusions presented in Section 4.

We drew upon analysis performed by the California Energy Commission of utility energy supply plans (forms S-2) and utility supply contracts (forms S-5) filed in 2011.[53] These forms were submitted by publicly owned utilities and, on a voluntary basis subject to partial confidentiality, the investor owned utilities Southern California Edison and San Diego Gas and Electric. The forms report delivered energy for the years 2009 and 2010, and projected and contracted amounts for years 2011 through 2020. This methodology is essentially equivalent to the approach taken by the draft March 2013 market report from the Emissions Market Assessment Committee members.[54]

We identified contracts and resource plans for energy delivery from seven coal-fired sources.[55] Contracted power amounts range from 19 MW (Banning's contract with San Juan Unit 3) to 1,045 MW (Los Angeles Department of Water and Power's partial ownership of the Intermountain Generating Station). Where available, we calculated the emissions associated with each contract for a given year based on the utility's reported planned energy delivery from that source for that year. In years for which a contract remained valid, but the California utility did not report a planned delivered energy amount, we estimated delivered energy and associated emissions based on the simple average of the utility's reported delivered or planned energy from the source between 2009 and 2012.

Our analysis considers two baseline scenarios. In the "Scheduled Divestment" scenario, we calculate baseline emissions based on the length of the California utility contract and on the expected continued operation of the source, as of the time of publication. In other words, we assume that when there are no specific plans in place to retire a power plant, the source will remain in use throughout the lifetime of the contract. While some of the plants that sell power to California utilities may shut down or refuel prior to contract

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[53] Forms S-2 and S-5 are available at http://energyalmanac.ca.gov/electricity/s-2_supply_forms_2011/ and http://energyalmanac.ca.gov/electricity/s-5_supply_forms_2011/, respectively. At the time of this paper's publication utilities have begun submitting updates forms S-2 and S-5 for 2013, which forms are expected to be compiled and available for further analysis no later than early 2014. Note that this basic methodology is equivalent to the approach taken by Bailey et al., supra note 39.

We gratefully acknowledge assistance from the California Energy Commission's Jim Woodward, who helped us identify and better understand the data sources used here. Of course, the opinions expressed in this paper are solely the authors' responsibility.

[54] *See* Bailey et al., supra note 39.

[55] Boardman Power Plant, Unit 1; Four Corners Power Plant Units 4 & 5 (treated as one source), Intermountain Generating Station Units 1 & 2 (treated as one source); Navajo Generating Station Units 1, 2, & 3 (treated as one source), Reid Garner Power Plant Unit 4; San Juan Power Plant Unit 3; and San Juan Power Plant Unit 4.

expiration,[56] these plants are presumed to continue operations under present circumstances. In this scenario, where plants are scheduled to close or re-power,[57] we presume that the utility will not enter a subsequent contract for more coal-based power.

Because SB 1368 prohibits new long-term contracts for power with coal-level emissions, but does not expressly forbid multiple short-term extensions of existing contracts,[58] we have also modeled potential leakage based on a "Maximum Coal" baseline scenario. In the "Maximum Coal" scenario, we assume all existing contracts are extended until scheduled plant closure. Because plant closures do not result in the continued operation of the coal based emission source outside of the California cap, we do not treat this reduction as leakage in either scenario. If a plant were to re-power simultaneously with divestment, leakage proportional to the difference in emissions between the current level and the re-powered level could occur, but the prospects of this situation occurring for any of the plants under consideration here remain purely speculative.[59]

We calculate the emissions associated with each contract on the basis of (1) planned power delivery per year, multiplied by (2) an emission factor based on fuel type, and (3) the plant heat rates. The California Energy Commission provided data on plant-level heat rates, based on the Velocity Suite database,[60] and we rely on fuel CO_2e emission coefficients published by the Energy Information Administration.[61] Where multiple units are treated as a single source, the simple average of the units' heat rates is used. Plant data are summarized in Table 4.

In order to calculate leakage potential, for each scenario we modeled two variations: replacement power supplied by zero-emission renewables and replacement power sup-

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[56] Navajo and Four Corners Units 4 & 5, for example, are currently involved in Clean Air Act regulatory processes that may result in decisions to shut down or refuel rather than retrofit to meet new air pollution reduction requirements. See http://www.epa.gov/region9/air/navajo.

[57] San Juan Unit 3 is slated to shut down by the end of 2017, despite contracts with California utilities that extend until 2030. *See* http://www.pnm.com/news/2013/0215-san-juan.htm?source=systems-sj-h. Boardman is scheduled for closure by the end of 2020, but this closure would not have any effects within our study period. *See* http://www.deq.state.or.us/aq/pge.htm. Reid-Gardner has recently been proposed for early closure in 2017, but this closure is not yet scheduled, and is therefore excluded form our analysis.

[58] *See* Cal. Pub. Utilities Code § 8341(a) (prohibiting utilities from entering any long-term financial commitment for baseload power unless the generation supplied under the commitment meets state GHG standards); *see also* § 8340(f) (defining a long-term financial commitment as "either a new ownership investment in baseload generation or a new or renewed contract with a term of five or more years, which includes procurement of baseload generation").

[59] Navajo and Four Corners Units 4 and 5 are subject to ongoing rulemaking processes that may eventually result in decisions to re-power, shut down, or partially shut down, but at present there are no firm plans for any particular change in operations. *See* http://www.epa.gov/region9/air/navajo. Reid Gardner Unit 4 is currently scheduled for retirement in 2023, but the plant's owner, NV Energy, has recently proposed retiring the unit in 2017. *See* http://mvprogress.com/2013/04/10/nv-energy-proposes-early-retirement-for-reid-gardner/.

[60] For more information on this privately-owned data aggregation service, see http://www.ventyx.com/en/enterprise/business-operations/business-products/velocity-suite

[61] Voluntary Reporting of Greenhouse Gases Program Fuel Emission Coefficients http://www.eia.doe.gov/oiaf/1605/coefficients.html.

plied by combined-cycle natural gas. In the case of renewable replacement power, leaked emissions equal 100% of coal-based emissions for which a utility would avoid responsibility through early divestment. Leakage potential for natural gas replacement of energy displaced by early divestment is calculated assuming an Emission Factor of 0.429 $mtCO_2e/MWh$, equivalent to the California Air Resources Board's designated emission factor for unspecified power.[62] Leakage is determined by calculating the difference between coal-based emissions and emissions from an equivalent supply of natural gas-based energy: leaked emissions are the emissions for which the utility would avoid responsibility through early divestment in coal power and substitution of natural gas power.

Table 4: Power Plant Data.

Plant	Utility	Averaged Heat Rate (Btu/kWh)	EIA Emissions Factor (lbs CO2e/MMBtu)	Emissions Factor (mtCO2e/MWh)
Four Corners Units 4 & 5	SCE	10023.5	212.7	0.967
Boardman (owned by Portland General Electric)	SDG&E	11097.0	212.7	1.07
Intermountain Generating Station	LADWP	10823.0	205.3	1.01
Navajo Units 1, 2 & 3	LADWP	10923.3	205.3	1.02
Reid Gardner Unit 4	CDWR	11611.0	205.3	1.08
San Juan Unit 3	Imperial ID	10578.0	212.7	1.02
MSR San Juan Unit 4	Silicon Valley Power	10662.0	212.7	1.03
MSR San Juan Unit 4	Modesto ID	10662.0	212.7	1.03
Intermountain Power Plant Unit 1	Anaheim	10762.0	205.3	1.00
Intermountain Power Plant Unit 2	Anaheim	10884.0	205.3	1.01
San Juan Unit 4	Anaheim	10662.0	212.7	1.03
Intermountain Power Plant	Riverside	10823.0	205.3	1.01
Intermountain Generating Station	Glendale	10823.0	205.3	1.01
San Juan Unit 3	Glendale	10578.0	212.7	1.02
Intermountain Generating Station	Pasadena	10823.0	205.3	1.01
Intermountain Generating Station	Burbank	10823.0	205.3	1.01
MSR San Juan Unit 4	Redding	10662.0	212.7	1.03
San Juan Unit 3	Colton	10578.0	212.7	1.02
San Juan Unit 3 (delivered via exchange)	Azusa	10578.0	212.7	1.02
San Juan Unit 3	Banning	10578.0	212.7	1.02

By a substantial margin, Los Angeles Department of Water and Power (LADWP) is in a position to potentially cause the most leakage by early divestiture. More than 40% of

[62] Cal. Code Regs, tit. 17, § 95111(b), *available at* http://www.arb.ca.gov/cc/reporting/ghg-rep/regulation/mrr-2012-clean.pdf.

If, rather than using the Air Resources Board's value, we had calculated the leakage on the basis of an assumed F-type gas turbine with a heat rate of 6,719 Btu/kWh, burning pipeline-quality natural gas with a carbon content of 53.06 kg CO_2/mmBtu (HHV), the emissions factor would have been .357 $mtCO_2$/MWh. Our leakage calculations for this scenario are therefore somewhat more conservative than they may have been under this plausible alternative assumption. *See* Energy Information Administration, Carbon Dioxide Emissions Factors for Stationary Combustion, available at http://www.eia.gov/oiaf/1605/coefficients.html; *see also* U.S. Department of Energy, National Energy Technologies Laboratory, Natural Gas Combined Cycle Plant (F-Class) Fact Sheet, http://www.netl.doe.gov/KMD/cds/disk50/NGCC%20Plant%20Case_FClass_051607.pdf.

total currently scheduled[63] coal-based utility emissions for the study period are attributable to this contract. If LADWP were to exchange its ownership interest in the Intermountain Generating Station with an out-of-state entity and replace its energy deliveries with renewable sources for which it could report zero emissions, up to 7.7 $mmtCO_2$ per year of leakage would result. If such a divestiture were to occur in 2013, 51.8 $mmtCO_2$ could leak through a single transaction. If all California utilities with an interest in or contract with the Intermountain plant were to divest in 2013 without accompanying plant closure or offsetting external emissions, over 87 $mmtCO_2$ would leak. Although the utility currently has no plans for divestment during the study period, it does intend to transition fully out of its relationship with Intermountain between 2020 and 2025.

Our calculations pertaining to the California Department of Water Resources's (CDWR) energy deliveries from Reid Gardner Unit 4 reflect CDWR's scheduled phase out of that contract, which expires in 2013. For years 2009 through 2012, CDWR received or planned an average of 924 GWh from Reid Gardner. Based on 2011 submissions to the California Energy Commission, CDWR planned to transition to deliveries from the recently completed Lodi natural gas-fired power plant in California beginning in 2013.[64] During the 2013 transition year, CDWR planned to receive 493 GWh from Reid Gardner, which would be supplemented with energy from the Lodi plant. If our analysis projected backwards to 2009, this transition would represent leakage to be calculated on a natural-gas replacement basis against the Maximum Coal baseline, but it would not represent leakage against the Scheduled Divestment baseline. Against this 2009 baseline, annual potential leakage estimates against the Maximum Coal baseline for this contract would approximately double. In order to capture as complete as possible a range of potential leakage on a consistent methodological basis our analysis calculates both natural gas replacement and renewable energy replacement potential leakage values for this contract, despite CDWR's plan to employ natural gas replacement. Because this is one of the relatively smaller contracts, the difference in potential cumulative leakage between the natural gas and renewable replacement scenarios is 1.8 $mmtCO_2e$ against the Maximum Coal Baseline, and 0.20 $mmtCO_2e$ against the Scheduled Divestment baseline.

Full results are provided in Table 5 and Table 6, below.

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[63] This contract is therefore associated with 40% of all renewable-replacement leakage potential against the "Planned Divestment" baseline and 27.7% of all renewable-replacement leakage potential against the "Maximum Coal" baseline.

[64] CDWR Public S-2 Supply Form 4-10-11, available at http://energyalmanac.ca.gov/electricity/s-2_supply_forms_2011/CDWR%20PUBLIC%20S-2%20Supply%20Form%204-20-11.xlsx.

Table 5: Cumulative Leakage Potential, Maximum Coal Baseline Scenario ($mmtCO_2e$).

Contract Expiration	Plant	Utility	Million Metric Tonnes CO2e By Year								CUMULATIVE LEAKAGE POTENTIAL	
			2013	2014	2015	2016	2017	2018	2019	2020	RENEWABLE REPLACEMENT	NATURAL GAS REPLACEMENT
2016	Four Corners Units 4 & 5	(GWh) SCE	5,129 4.96	5,129 4.96	5,129 4.96	5,129 4.96	5,129 4.96	5,129 4.96	5,129 4.96	5,129 4.96	39.68	22.1
2018	Boardman (owned by Portland General Electric)	(GWh) SDG&E	545 0.58	545 0.58	545 0.58	545 0.58	545 0.58	545 0.58	545 0.58	545 0.58	4.67	2.8
2027	Intermountain Generating Station	(GWh) LADWP	7,147 7.20	7,639 7.70	7,398 7.46	6,888 6.94	6,314 6.36	5,794 5.84	5,301 5.34	4,933 4.97	51.82	29.8
2030	Navajo Units 1, 2 & 3	(GWh) LADWP	3,887 3.95	3,887 3.95	3,887 3.95	3,887 3.95	3,887 3.95	3,887 3.95	3,887 3.95	3,887 3.95	31.63	18.3
2013	Reid Gardner Unit 4	(GWh) CDWR	493 0.53	493 0.53	493 0.53	493 0.53	493 0.53	493 0.53	493 0.53	493 0.53	4.24	2.6
2030	San Juan Unit 3	(GWh) Imperial ID	754 0.77	723 0.74	755 0.77	756 0.77	755 0.77	0 0.00	0 0.00	0 0.00	3.82	2.2
2030	MSR San Juan Unit 4	(GWh) Silicon Valley Power	425 0.44	425 0.44	425 0.44	425 0.44	425 0.44	425 0.44	425 0.44	425 0.44	3.50	2.0
2030	MSR San Juan Unit 4	(GWh) Modesto ID	424.80 0.59	424.80 0.62	424.80 0.61	424.80 0.62	424.80 0.62	424.80 0.62	424.80 0.62	424.80 0.62	4.90	3.4
2027	Intermountain Power Plant Unit 1	(GWh) Anaheim	902 0.90	958 0.96	902 0.90	961 0.96	902 0.90	958 0.96	902 0.90	961 0.96	7.46	4.3
2027	Intermountain Power Plant Unit 2	(GWh) Anaheim	958 0.97	902 0.91	958 0.97	904 0.92	958 0.97	902 0.91	958 0.97	904 0.92	7.54	4.4
2030	San Juan Unit 4	(GWh) Anaheim	360 0.37	401 0.41	378 0.39	408 0.42	381 0.39	412 0.42	386 0.40	413 0.42	3.23	1.9
2027	Intermountain Power Plant	(GWh) Riverside	1031 1.04	1038 1.05	1020 1.03	1041 1.05	998 1.01	1012 1.02	1028 1.04	956 0.96	8.19	4.7
2027	Intermountain Generating Station	(GWh) Glendale	245 0.25	245 0.25	245 0.25	245 0.25	245 0.25	245 0.25	245 0.25	245 0.25	1.98	1.1
2030	San Juan Unit 3	(GWh) Glendale	110 0.11	110 0.11	110 0.11	110 0.11	110 0.11	0 0.00	0 0.00	0 0.00	0.56	0.3
2027	Intermountain Generating Station	(GWh) Pasadena	725 0.73	725 0.73	725 0.73	727 0.73	725 0.73	725 0.73	725 0.73	727 0.73	5.85	3.4
2027	Intermountain Generating Station	(GWh) Burbank	538 0.54	538 0.54	538 0.54	538 0.54	538 0.54	538 0.54	538 0.54	538 0.54	4.34	2.5
2030	MSR San Juan Unit 4	(GWh) Redding	60 0.06	60 0.06	60 0.06	180 0.19	180 0.19	180 0.19	180 0.19	180 0.19	1.11	0.6
2030	San Juan Unit 3	(GWh) Colton	144 0.15	144 0.15	144 0.15	144 0.15	144 0.15	0 0.00	0 0.00	0 0.00	0.74	0.4
2030	San Juan Unit 3 (delivered via exchange)	(GWh) Azusa	194 0.20	205 0.20	200 0.20	200 0.20	202 0.20	0 0.00	0 0.00	0 0.00	1.02	0.6
2030	San Juan Unit 3	(GWh) Banning	127 0.14	134 0.14	131 0.14	131 0.14	132 0.14	0 0.00	0 0.00	0 0.00	0.68	0.4
LEAKAGE POTENTIAL	RENEWABLE REPLACEMENT		24.5	25.0	24.8	24.4	23.8	21.9	21.4	21.0	186.9	
	NATURAL GAS REPLACEMENT		14.1	14.4	14.3	14.1	13.7	12.6	12.4	12.1		107.7

Estimated Figure
Plant Closure
Contract Expiration
Scheduled Divestment

Table 6: Cumulative Leakage Potential, Scheduled Divestment Baseline Scenario ($mmtCO_2e$).

Contract Expiration	Plant	Utility	Million Metric Tonnes CO2e By Year								CUMULATIVE LEAKAGE POTENTIAL	
			2013	2014	2015	2016	2017	2018	2019	2020	RENEWABLE REPLACEMENT	NATURAL GAS REPLACEMENT
2016	Four Corners Units 4 & 5	(GWh) SCE	5,129 4.96	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	**4.96**	**2.76**
2018	Boardman (owned by Portland General Electric)	(GWh) SDG&E	545 0.58	545 0.58	545 0.58	545 0.58	545 0.58	545 0.58	0 0.00	0 0.00	**3.50**	**2.10**
2027	Intermountain Generating Station	(GWh) LADWP	7,147 7.20	7,639 7.70	7,398 7.46	6,888 6.94	6,314 6.36	5,794 5.84	5,301 5.34	4,933 4.97	**51.82**	**29.76**
Planned Divestment by end of 2015	Navajo Units 1, 2 & 3	(GWh) LADWP	3,887 3.95	3,887 3.95	3,887 3.95	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	**11.86**	**6.86**
2013	Reid Gardner Unit 4	(GWh) CDWR	493 0.53	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	**0.53**	**0.32**
2030	San Juan Unit 3	(GWh) Imperial ID	754 0.77	723 0.74	755 0.77	756 0.77	755 0.77	0 0.00	0 0.00	0 0.00	**3.82**	**2.21**
2030	MSR San Juan Unit 4	(GWh) Silicon Valley Power	425 0.44	425 0.44	425 0.44	425 0.44	425 0.44	425 0.44	425 0.44	425 0.44	**3.50**	**2.04**
2030	MSR San Juan Unit 4	(GWh) Modesto ID	424.80 0.59	424.80 0.62	424.80 0.61	424.80 0.62	424.80 0.62	424.80 0.62	424.80 0.62	424.80 0.62	**4.90**	**3.44**
2027	Intermountain Power Plant Unit 1	(GWh) Anaheim	902 0.90	958 0.96	902 0.90	961 0.96	902 0.90	958 0.96	902 0.90	961 0.96	**7.46**	**4.27**
2027	Intermountain Power Plant Unit 2	(GWh) Anaheim	958 0.97	902 0.91	958 0.97	904 0.92	958 0.97	902 0.91	958 0.97	904 0.92	**7.54**	**4.35**
2030	San Juan Unit 4	(GWh) Anaheim	360 0.37	401 0.41	378 0.39	408 0.42	381 0.39	412 0.42	386 0.40	413 0.42	**3.23**	**1.88**
2027	Intermountain Power Plant	(GWh) Riverside	1031 1.04	1038 1.05	1020 1.03	1041 1.05	998 1.01	1012 1.02	1028 1.04	956 0.96	**8.19**	**4.70**
2027	Intermountain Generating Station	(GWh) Glendale	245 0.25	245 0.25	245 0.25	245 0.25	245 0.25	245 0.25	245 0.25	245 0.25	**1.98**	**1.13**
2030	San Juan Unit 3	(GWh) Glendale	110 0.11	110 0.11	110 0.11	110 0.11	110 0.11	0 0.00	0 0.00	0 0.00	**0.56**	**0.33**
2027	Intermountain Generating Station	(GWh) Pasadena	725 0.73	725 0.73	725 0.73	727 0.73	725 0.73	725 0.73	725 0.73	727 0.73	**5.85**	**3.36**
2027	Intermountain Generating Station	(GWh) Burbank	538 0.54	538 0.54	538 0.54	538 0.54	538 0.54	538 0.54	538 0.54	538 0.54	**4.34**	**2.49**
2030	MSR San Juan Unit 4	(GWh) Redding	60 0.06	60 0.06	60 0.06	180 0.19	180 0.19	180 0.19	180 0.19	180 0.19	**1.11**	**0.65**
2030	San Juan Unit 3	(GWh) Colton	144 0.15	144 0.15	144 0.15	144 0.15	144 0.15	0 0.00	0 0.00	0 0.00	**0.74**	**0.43**
2030	San Juan Unit 3 (delivered via exchange)	(GWh) Azusa	194 0.20	205 0.20	200 0.20	200 0.20	202 0.20	0 0.00	0 0.00	0 0.00	**1.02**	**0.59**
2030	San Juan Unit 3	(GWh) Banning	127 0.14	134 0.14	131 0.14	131 0.14	132 0.14	0 0.00	0 0.00	0 0.00	**0.68**	**0.40**
LEAKAGE POTENTIAL	**RENEWABLE REPLACEMENT**		**24.50**	**19.54**	**19.29**	**15.00**	**14.35**	**12.50**	**11.41**	**11.00**	**127.6**	
	NATURAL GAS REPLACEMENT		**14.1**	**11.3**	**11.2**	**8.7**	**8.4**	**7.3**	**6.6**	**6.4**		**74.1**

Estimated Figure
Plant Closure
Contract Expiration
Scheduled Divestment