

## California's cap-and-trade system: Diffusion and lessons

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## Introduction

California adopted and designed its cap-and-trade system at a time when experimentation with emissions trading emerged in many countries and regions, notably in the European Union, and even lawmakers in Washington DC discussed it as an option for strengthening US federal climate policy. The California State Legislature adopted the *Global Warming Solutions Act* in 2006, and the cap-and-trade system came into effect in 2012. This paper investigates the role of policy diffusion and policy learning in shaping the design of California's cap-and-trade system. The system's specific design elements play a vital role for its environmental and economic performance, and the potential for other states and countries to link to California's carbon market.

Two sets of theoretical assumptions help explain the scope and design of California's cap-and-trade. First, we build on previous research when we assume that policy diffusion mechanisms like regulatory competition and/or policy learning influenced decision makers to learn from elements of other trading systems when designing the California emissions trading program. We explore actors, interests, administrative arrangements, institutions and ideas that have been crucial in the design and scope of the California cap-and-trade system, and analyze the importance of policy diffusion mechanisms in this process. Policy diffusion and learning from other ETS design processes, both international and domestic, can likely explain choices made for the design of the California cap-and-trade.

Second, we assume that local political concerns were also important for the design of California's cap-and-trade system. We seek to identify political factors that may have facilitated or restricted the policy diffusion process in the Californian context. We expect local political concerns to be instrumental for explaining the cap-and-trade system's specific

design elements and scope. Several elements in the carbon market are controversial. First, California's cap-and-trade is comprehensive in coverage, and expanded to cover also the transport sector in the second commitment period (2015-2017) to the dismay of the state's sizeable oil industry. Second, while the democratic state congressional majority and Governor Brown keep pushing forward with policy initiatives to strengthen the carbon price and expand the carbon market further by linking with other cap-and-trade systems, critics claim that California is a special case and that others cannot easily copy its policies. Furthermore, controversy is emerging regarding the innovative use of revenue generated from cap-and-trade auctioning, which has filled up the Greenhouse Gas Reduction Fund substantially, allowing the state government to support infrastructure investments, projects for disadvantaged communities and other low-carbon policies. In sum, the scope and design influence the linking potential to other trading systems.

### **Background: California's cap-and-trade program**

The California cap-and-trade experiment initiated at a time when attention and knowledge about climate change was increasing, but federal climate policy was in a gridlock between a polarized US Congress and a president, George W. Bush, unwilling to move on federal climate policy. Attempts to adopt a federal cap-and-trade system failed in the US Senate in 2003 and 2005, in parallel with EU's introduction of ETS. In California, the political majority was different from Washington DC, with dominance of one party – the democrats - in the state assembly. With a strong history of environmental policy pioneering, California democrats advocated the need for climate action. In an unlikely alliance with republican governor Schwarzenegger, these legislators put climate policy on the agenda, and looked to the EU and the Kyoto Protocol experience for inspiration when they proposed The Global

Warming Solutions Act (AB 32).<sup>1</sup> The California Legislature adopted AB 32 in 2006, and governor Schwarzenegger signed it into law. AB 32 constitutes the basic building block legislation that made possible the development of California’s climate policy package. AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020 — a reduction of approximately 15 percent below emissions expected under a “business as usual” scenario.

With AB 32 adopted, the California Air Resources Board (CARB) was authorized to develop regulations to achieve “the maximum technologically feasible and cost-effective GHG emission reductions.” AB 32 did not recommend emissions trading specifically, but as an option for how to implement the objectives in the legislation. The full implementation of AB 32 “intends to help mitigate risks associated with climate change, while improving energy efficiency, expanding the use of renewable energy resources, cleaner transportation, and reducing waste” (CARB 2016).

CARB developed an initial Scoping Plan in 2008, which outlined California’s emissions reduction target and included a wide range of recommended strategies, direct regulations, market-based approaches, voluntary measures and other programs. The most important policy programs introduced were the renewable portfolio standard (RPS), the low carbon fuel standard (LCFS), energy efficiency measures, and the cap-and-trade system. It was politically sensitive to use market mechanisms at the time, mainly because some ENGOs, environmental justice groups, and parts of the democratic congress majority were sceptic towards such policy instruments. Over the next three years, CARB’s own experts developed the detailed rules of the cap-and-trade program, and engaged a range of external experts and stakeholders in the process. In 2011, CARB submitted final rules for the state’s cap-and-trade program, and

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<sup>1</sup> Interview 1

the program was implemented in January 2012. An update of the Scoping Plan was approved by CARB in 2014, and includes new strategies and recommendations.

California's cap-and-trade system covers about 85% of the state's total emissions, and targets emitters of more than 25 000 tons of CO<sub>2</sub> equivalents annually. It covers all major sectors, including electricity producers and first deliverers, process industry and manufacturing, oil and gas producers, and transport fuels. In total, about 450 entities are required to participate in the carbon market. The allocation of permits is based on 90% free allocation and 10% auction in the first two phases, with a reduction of free permits to 75% by 2020 for some covered sectors in the third phase. Banking and borrowing of permits is allowed. The rules for offset purchasing are firm; allowing maximum 8% offset permits for each covered entity and quite rigid assessments of eligible projects. Offsetting projects approved so far are mainly located in the United States, but expansion to international REDD projects are under discussion. For the purposes of reliable monitoring, reporting and verification of activities in the market and cuts in emissions, CARB requires all covered entities to report on a yearly basis. The program contains a flexible price-containment mechanism, where the Allowance Price Containment Reserve builds up a pool of additional allowances that can be introduced into the market if permit prices exceeded specified levels. In effect, this creates a price ceiling. The program also has a price floor that started at \$10 per ton for 2012–2013, and then increasing at a rate of 5% per year. Finally, the revenue from auctions go into the Greenhouse Gas Reduction Fund, and proceeds are earmarked for low carbon development projects in California (Wettestad and Gulbrandsen 2015, Rabe 2016, EDF/IETA 2015).

In parallel with establishing the cap-and-trade program, California helped initiate the Western Climate Initiative (WCI) from 2007 onwards. WCI was a regional collaborative initiative to develop a regional cap-and-trade program, with seven US states (California, Washington, Oregon, New Mexico, Arizona, Utah, and Montana) and four Canadian provinces (Quebec,

Ontario, Manitoba and British Columbia) as members. Over a period of four years, several partner workshops and meetings planned the design elements of WCI, making it close to implementation ready by 2011. However, after federal climate policy initiatives stalled in the US Congress in 2010 and a wave of new governors took office after the midterm elections the same year, almost all collaborating states bowed out of WCI by the end of 2011 (Rabe 2016). Only California and Quebec remained committed to implementing cap-and-trade, and in 2014, the two programs formally linked and now constitutes one carbon market. Other WCI members have either abandoned cap-and-trade entirely, or still planning for possible future implementation.

In sum, California's cap-and-trade was designed to be a 'backstop' that sweeps up GHG emission cuts that other key parts of the state's climate policy program – the Renewable Portfolio Standard, the energy efficiency program, the Low Carbon Fuel Standard – do not cover. In the design process, regulators looked to other emission trading systems like the EU ETS, RGGI, and discussions within the Western Climate Initiative, when they designed important mechanisms like allowance allocation and offset rules. At the time, state-level climate action was buzzing as a result of low attention to the issue at the US federal level under President Bush. In this context, California made strides to develop a climate policy model that other parts of the country could follow, and made an active effort to shape the national debate.

## **Analytical framework**

Our point of departure is that two sets of explanatory factors can help explain the scope and design of California's cap-and-trade system. First, policymakers can learn about policies, administrative arrangements, institutions and ideas from other trading systems (Shipan and

Volden 2012, Elkins and Simmons 2005). Second, local political concerns are important (Dolowitz and Marsh 2000).

We build on previous research when we investigate whether *policy diffusion* influenced decision makers, and led them to learn from elements of other trading systems when designing the California emissions trading program. Policy diffusion can be defined broadly as ‘a process in which policies spread across time and space’ (Börzel and Risse 2012).

Diffusion happens via learning, or as adaptation to altered conditions (Elkins and Simmons 2005:39). For learning, two main mechanisms can be identified: The first is ‘transnational communication and lessons drawing’, where a government that is considering introducing emissions trading draws rational lessons about program design from external actors. These lessons can be drawn from others through bilateral channels or multilateral channels, and be communicated by governmental and non-governmental actors.

Both convergence and divergence may occur as policy instruments evolve over time. Indeed, recent scholarship has argued that full convergence is not a necessary or even a likely outcome of diffusion because norms, ideas and practices often change in form and content as they diffuse (Klingler-Vidra and Schleifer 2014: 264). This draws attention towards local political considerations and local actors’ possible use of emissions trading to further other underlying policy objectives. Moreover, learning how to avoid the weaknesses of a policy model appears to be an important form of sophisticated learning, leading to incomplete rather than complete policy convergence (Klingler-Vidra and Schleifer 2014). Hence, *local political factors* are crucial for explaining ETS program design. Local institutions act as “filters” through which external practices and impulses pass (Jackson Inderberg and Bailey 2016; Falkner and Gupta 2009).

The paper assesses how three sets of local factors and actors may have facilitated or restricted the policy diffusion process in the Californian context. First, we explore how prevailing economic, political and cultural characteristics shaped the scope and design of the cap-and-trade system. Previous research point out that “the greater the difference between two countries, the more adaptation to local circumstances will be required” (Underdal 2013: 19). This observation is corroborated by some diffusion research that finds that cultural proximity increases the likelihood of policy diffusion (Jordan and Huitema 2014). Hence, we may expect diffusion across very different jurisdictions to be less likely or to result in significant policy divergence.

Second, we assess the role of institutional frameworks. We pay particular attention to the opportunities and constraints formal policy-making procedures provide for actors to influence policy outcomes. We also aim to identify veto players in the state government, i.e. actors that can block or change the adoption of particular policy models or design features (cf. Tsebelis 2002). We also look into the material effect cap-and-trade had on key industry actors, and identify their lobbying efforts in the policy-making process. In the context of policy diffusion, we expect affected actors to exploit varying opportunities to block, change or refine specific design elements, suggesting that full convergence is not a likely outcome of diffusion across jurisdictions with different policy styles and industry structures.

Third, we analyze whether path dependencies and lock-in effects in terms of previous policy programs and experience influenced the scope and design of the cap-and-trade system. Previous research demonstrate that path dependencies can create “lock-in” effects that constrain and influence policy choices (Pierson 2000). A key point for path dependency scholars is that the timing and sequence of choices governing the development of a policy can constrain and impact future choices and political processes. Given the expected impact of path



dependencies from existing policies, we would not expect full convergence as a particular model diffuse from one jurisdiction to another.

Adapting these considerations to California's cap-and-trade design discussion, we first assess not only policy consequences but also local political factors that affected considerations made by decision makers, like the importance of electoral support (Arnold 1990). We look into interdependence relationships between policy-makers and the electorate (e.g. Bueno de Mesquita et al. 2005) and policy-makers and interest groups (e.g. Skodvin et al. 2010), assuming that the support of the electorate and stakeholders was important as policymakers developed the design of the cap-and-trade system. Tsebelis (1995) conceived of the stability of an established policy as a function of (a) the number of veto players, (b) the opinion distances among them, and (c) their collective action capacity. Hence, finding a compromise policy program that attract sufficient support is assumed to have been crucial. We also recognize path dependency related to previous policy decisions and actions as potentially important for developing California's climate policy program (Pierson 2000). We examine how past policies affected the design of the cap-and-trade system by analyzing whether established policy programs (the status quo) and prior political decisions created path dependency for the policy learning process.

Finally, we assess the potential for California's cap-and-trade – developed specifically in its own special political context – to link with other systems. Is California's design and scope a role model for other systems because of its effectiveness, and what strategies are employed by politicians and regulators to facilitate linkage with other trading systems?

We employ data from position papers and reports produced by major actor groups, more formal stakeholder processes, impact assessments, and policy reviews. Hearings and public discussions in the state legislature and other decision-making institutions (notably CARB) are

also used. These processes provide evidence of the forms of reasoning underpinning the design of the cap-and-trade system and the explicit and more implicit reference to external factors – lessons, competitive concerns, and tactical concerns. The data is scrutinized in order to provide a comprehensive picture of the main societal actors and arguments shaping the cap-and-trade system’s design and scope, as well as to specify to what extent and how different diffusion mechanisms were operating. Complementing this with semi-structured interviews with key stakeholders enables firm process tracing to identify the causal chains of events and path dependencies that resulted in the design of the California cap-and-trade system. We conducted 13 semi-structured expert interviews in October 2015 (see Appendix). Interviews started with a presentation of our research questions, and were followed by approximately six open-ended questions related to the role of the organization/expert in shaping the design of the cap-and-trade program, to identify who the key actors in the design process were, and to assess where the idea of cap-and-trade originated from. Interviews lasted between 45 and 90 minutes. We interviewed state politicians or their expert staff, ENGOs, relevant state agencies and academics. We were not able to get interviews with utilities or oil industry representatives, which would have been preferable to maximize representativeness of primary data material. Secondary data like E&E News and published literature have been employed to fill this gap in our interview data.

## **Analysis**

### *Origins of the cap-and-trade program: a case of policy diffusion?*

Previous research points to a number of potential sources of learning as California designed its cap-and-trade program. Emissions trading as a climate policy instrument originated in discussions related to the Kyoto Protocol in the late 1990s, inspired by successful US

experiences with the SO<sub>2</sub> trading market established under the Clean Air Act (Schmalensee and Stavins 2013). After initial skepticism, the European Union embraced the idea of a carbon market and started planning and implementing its pioneering ETS from 2001 onwards (Skjærseth and Wettestad 2008). In a parallel process, the US Congress debated several proposals for adopting a federal cap-and-trade program, but bills failed in the Senate in 2003, 2005 and 2008 (Bang 2010). Moreover, nine states on the East Coast formed the Regional Greenhouse Gas Initiative (RGGI) in 2005 with the aim to set up a regional cap-and-trade to cut GHG emissions from the electricity sector. WCI was initiated on the heels of RGGI in 2007, and included both a broader scope (all sectors of the economy) and membership (11 states and provinces) (Rabe 2016).

Our interviewees point to several sources of learning as California's cap-and-trade system was designed. First, in the early phase politicians and regulators were interested in drawing lessons from the experiences made when the EU developed and implemented its emissions trading system. European politicians visited California, and, in particular, Tony Blair helped convince Governor Schwarzenegger that emissions trading would be a cost-effective and useful policy approach for California.<sup>2</sup> Some interviewees mentioned that it might have made a difference that the governor was European, and hence inclined to be influenced by European experiences.<sup>3</sup> Schwarzenegger became an important pusher for a California cap-and-trade system. Bureaucrats and technical experts from the EU visited California several times to share their knowledge and experience.<sup>4</sup> Representatives from CARB also went on study-trips to the EU to learn about emissions trading.<sup>5</sup> A common understanding among our interviewees is that the main purpose of learning from the EU was to avoid some of the key

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<sup>2</sup> Interview 13

<sup>3</sup> Interview 13

<sup>4</sup> Interview 2

<sup>5</sup> Interview 6

mistakes, especially regarding over-allocation of permits, rules for offsets, and avoiding windfall profits to emitters. Such design elements had caused serious flaws in the European ETS, driving the carbon price too low, and Californian politicians and regulators were set on not making the same mistakes. Hence, learning from the EU ETS mainly focused on designing better allocation- and offset rules for California.

Second, our interviewees emphasized the increasingly important role of other domestic emissions trading programs as sources of influence in the design-phase of the cap-and-trade. Specifically, collaboration within the WCI inspired important choices made. For several years pursuant to and parallel to CARB's work with the scoping plan, western states and Canadian provinces were engaged in collaboration on developing a multi-sector, market-based program to reduce greenhouse gas emissions. California, Montana, New Mexico, Oregon, Utah, and Washington, and the Canadian provinces of British Columbia, Manitoba, Ontario, and Quebec took part in the discussions from 2007-2011. Some of our interviewees pointed to an interactive process, where common WCI design elements were developed for offset and compliance with the specific aim of future linkage between systems, and all participating states went through lawmaking preparations.<sup>6</sup> More critical voices see the WCI process as dominated by Californian ideas and expert knowledge, and California as the main provider of premises for other WCI members (Rabe 2016, [Interview X](#)). By 2011, all member states except California withdrew from WCI. Still, the design of Quebec's cap-and-trade system was clearly influenced by WCI collaboration, which simplified the process of linkage to California's system.<sup>7</sup>

Some of the flexibility provisions in the California cap-and-trade program were designed based on lessons from the EU ETS and RGGI (Rabe 2016). Specifically, the number of

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<sup>6</sup> Interview 5

<sup>7</sup> Interview 5

covered entities will expand over time, and hence increase the size of the market. The percentage of emission allowances that will be auctioned rather than allocated without charge will also increase gradually, from 10% in 2012 and reaching 25% by 2020. The auctioning method is designed to generate government revenue for specific purposes, with some parallels to a carbon tax (Rabe 2016). After activating the California cap-and-trade system's first phase from January 2013 regulators increasingly are in a dialogue about linkage with RGGI, as well as the US EPA which is in the process of implementing federal regulations for cutting carbon emissions from utilities.<sup>8</sup>

Third, academics made a significant impact on designing the cap-and-trade system. Notably, an independent committee consisting of economists from California's top universities gave important input to CARB on specific design elements, like the price collar.<sup>9</sup> This academic study was designed to do a lot—among other things, to create political cover for a trading system. There were many interest groups quite opposed to trading. That helps explain why the policy outcome was both—regulation and trading.<sup>10</sup>

CARB ran a thorough preparatory process between 2007 and 2012 to develop the cap-and-trade program and the broader climate policy package. Based on the experiences with over-allocation and windfall profits in the EU ETS, CARB put a lot of weight on ensuring that the data and rules were right before implementation of the carbon market.<sup>11</sup> Stakeholder involvement was important in this process, and CARB organized 24 workshops with a broad range of stakeholders to discuss the design of the cap-and-trade system. More than 20 designated experts in CARB worked on developing the scoping plan. All new proposed design elements were subject to public hearing processes with long commenting periods, and

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<sup>8</sup> Interview 5

<sup>9</sup> Interviews 9, 10 and 11

<sup>10</sup> We plan to expand on this topic in later versions.

<sup>11</sup> Interviews 6 and 11

thousands of comments were submitted and answered.<sup>12</sup>In particular, CARB considered and planned the interaction between the complementary policies (RPS, LCFS) and the cap-and-trade program as a backstop to sweep up remaining GHG emissions cuts, and designed the system with a price collar that allowed the carbon price to stay at a politically acceptable level.<sup>13</sup>

To summarize, the California cap-and-trade program design developed with an eye to the experiences from other emissions trading systems, in particular the EU ETS, RGGI, and the regional WCI collaboration. The main focus was to avoid making the same mistakes as others had experienced, especially related to allocation of permits, compliance rules, offset practices and price-setting. In other words, diffusion happened by avoidance rather than copying (Underdal 2013). Domestic internal learning and diffusion was more important than the EU throughout the design process, and learning from the EU by avoidance was most important initially and did not make much of a difference when the system was up and running.

#### *Local political concerns: path dependency and politics*

In developing its climate policy program, California's democratic political majority and the regulatory authorities did not only draw lessons from other emissions trading systems. Designing a system that took local concerns into account was crucial for garnering support from stakeholders and the public. Hence, local political concerns mediated how lessons were learned. California has a long history of serious air pollution problems, and the state is vulnerable to serious impacts of climate change, like droughts, wildfires and water shortages. Californians express high concern for environmental degradation and climate change, and

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<sup>12</sup> Interview 5

<sup>13</sup> Interview 5

relatively strong support for climate policy compared to other states (Yale Program on Climate Change Communication 2013).

The Clean Air Act in 1970 assigned special rights for California to be a frontrunner for air pollution policy, and regulatory agencies built a solid capacity to design environmental regulation, with particular expertise in air pollution problems. As a result, an exceptional number of people with high competence within the field work in key agencies like the CARB, the California Energy Commission, and the California Public Utility Commission. Our interviewees underlined this highly developed competence as crucial for California's ability to design the current climate policy program.<sup>14</sup>

All of our interviewees underline that the so-called 'complementary policies' – the RPS, LCFS, and energy efficiency measures – in fact represent the most important components in California's climate policy package in terms of emissions reductions. Regulators and legislators emphasize that the complementary policies were designed to take the bulk of emissions cuts (as much as 80% in 2015), while the cap-and-trade system was designed to be a backstop that sweep up remaining cuts (not more than 20% in 2015) that are not addressed through the RPS, energy efficiency measures, or LCFS.<sup>15</sup>

This policy mix was purposely designed this way to avoid soaring permit prices and political controversy, according to regulators and legislators.<sup>16</sup> If allowance prices had been too high, protests could have mounted against cap-and-trade and potentially jeopardized its continuance. The climate policy package is built to gradually increase allowance prices, and gradually increase acceptance of cap-and-trade among stakeholder groups.<sup>17</sup>

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<sup>14</sup> Almost all interviews mentioned this

<sup>15</sup> Interviews 5, 6, 2, 3 and 1

<sup>16</sup> Interviews 5, 6, 2, 3 and 1

<sup>17</sup> Interviews 5, 6, 2, 3 and 1

A strong coalition of actors were heavily involved in designing the climate policy package in this particular way, with intended interaction between direct regulation and cap-and-trade. The coalition consists of legislators, the governor's office, and emissions trading experts in key state agencies and ENGOs. First, democratic legislators, like senator Pavley, formed a strong majority in the state legislature that actively pushed through legislation that could support a strong climate policy, including cap-and-trade. Part of their mission was to have regular hearings and debates in the state legislature that would educate state politicians on the climate change issue, with the intention to build a stable majority coalition that support climate policy initiatives in both the Assembly and Senate.<sup>18</sup> The midterm elections in 2014 brought in a diverse group of democrats that represent both traditionally strong environmentalist strongholds like Los Angeles and San Francisco, but also more representatives for low-income voters and districts with industries and business sectors that are not as enthusiastic about climate policy. These new legislators look for amendments to the climate policy package that take into account their constituents' concerns. For instance, senator Ben Hueso proposed legislation (SB 189) to educate and prepare the workforce for more 'green jobs' and at the same time increase employment levels in low-income households.<sup>19</sup>

Second, the Governor's office has persistently supported cap-and-trade as a central piece of California's climate policy. Governors Schwarzenegger, Davis and Brown were instrumental in initiating and supporting ambitious climate policy initiatives. In close alliance with the democrat majority in the state legislature they used executive orders at crucial moments to initiate and implement climate policy instruments like the cap-and-trade that initially did not get direct support in legislature. CARB gets its authority both from legislation and from the

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<sup>18</sup> Interview 1

<sup>19</sup> Interviews 1, 2, 3 and 4



governor. When the former is unsupportive, then the latter can re-steer CARB on new missions. In the climate policy case, experts hired at CARB were selected and promoted for their support of the pro-climate policy approach. Continued support from the governor's office for cap-and-trade is expected by the democratic majority in the state legislature, since it is unlikely that a governor that is unsupportive of a strong climate policy would be elected in California.<sup>20</sup>

Third, the coalition includes experts from the CARB, Energy Commission, and NRDC that were instrumental in designing the climate policy package, based on strong expertise and decades of experience as described above. Some of the top people involved have worked on environmental regulations since the 1970s. They represent a network of experts that have worked together over many years, and to a large extent are on the same page in terms of what the best policy solutions are. Drawing on lessons from previous regulatory processes, these experts were instrumental in designing a climate policy package for California where command and control measures like the RPS, LCFS and energy efficiency regulations are the basic building blocks. Cap-and-trade, being a new and untested policy instrument, was given a less central place, at least in the early phases. ENGOs, in particular NRDC and EDF, worked in close partnership with regulators on developing the design of the cap-and-trade system, and had a powerful position in designing key elements like the offset rules.<sup>21</sup> One example of close relations and transitioning of experience and knowledge in the decision-maker network is Mary Nichols, who first worked as NRDC staff and later came to the CARB

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<sup>20</sup> Interviews 1, 2, 3 and 4

<sup>21</sup> Interviews 12, 13, 9, 10 and 11

as a key person during the scoping plan years. Critics question ENGOs for having too close relations to regulators and for their lack of critical input to the policymaking process.<sup>22 23</sup>

Major stakeholders were closely involved in shaping the climate policy package. California's investor-owned utilities (IOUs) - Pacific Gas & Electric, Southern California Edison and San Diego Gas & Electric - played an important role in the scoping plan process, and very actively took part in workshops organized by CARB and in hearings and commenting regulatory proposals. As key stakeholders, the IOUs weighed in with their market expertise to shape the design. The allocation mechanism and auctioning rules were of particular interest to utilities. In the cap-and-trade program, permits are distributed free to utilities, which was a crucial requirement from the power producers. To create a market, IOUs must sell all of their permits at quarterly auctions and then buy back enough permits to cover their emissions. Moreover, the emissions associated with the power that is imported into the state must be accounted for. About 30 percent of power is imported from neighboring states. As a result, the issue of resource shuffling is addressed, which is a form of carbon leakage specific to the electricity sector. Leakage occurs when state distributors improperly substitute imports from low-emitting sources for high-emitting sources to the California electricity network. As a result, higher emitting power is redirected to states not covered by a cap (Cullenward 2014; EDF/IETA 2015). The cap-and-trade regulation specifically list 13 "safe harbors" that are not considered resources shuffling. First deliverers must report electricity deliveries to CARB with emissions calculated under the specific compliance obligations (EDF/IETA 2015).. Resource shuffling can impact the carbon price and also can undermine the efficacy of the cap-and-trade program and California's ability to meet its emission reduction targets (Cullenward 2014). Californian IOUs are generally considered the most progressive IOUs in

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<sup>22</sup> Interviews 10 and 11

<sup>23</sup> We plan to elaborate more on the key role of NRDC, which was pointed out by some interviewees as the most important architect of the cap-and-trade system.

the country on climate change issues, and with the current design for allocation, auctions, reporting and compliance they are not opposed to regulation.

California's Independent System Operator (CAISO) is becoming more involved in a dialogue with CARB and CPUC as plans to expand California's electricity market into a regional market are evolving. CAISO underline the need to design an efficient day-ahead market to include more renewables at the same time as having a well-functioning energy imbalance market. Interaction with the cap-and-trade system is especially important for price-setting in the electricity market.<sup>24</sup>

Fuel suppliers and the oil industry have taken on a stronger opposition role to the climate policy package than the utility industry. The oil industry prefer a cap-and-trade system over a carbon tax, and have signaled strong disagreement with the RPS and LCFS. In 2015, the industry launched a massive campaign to prevent new legislation that would have mandated a state-wide reduction in oil consumption of 50% by 2050. The lobby campaign appears to have had effect, since the bill (SB 350) did not receive sufficient support in the state legislature in a decisive vote in October 2015.<sup>25</sup> Several of our interviewees described it as a very successful campaign.<sup>26</sup>

Some of our interviewees, who are independent academics, were quite critical to the design of the policy mix, and pointed out that the de facto central role of the RPS and LCFS is an indication that the cap-and-trade system is not working optimally.<sup>27</sup> Too many compromises have been made with stakeholders, which have opened up for leakage problems. In particular, resource shuffling involving creative ways of using coal-fired power from neighboring states

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<sup>24</sup> Interview 7

<sup>25</sup> Interview 2

<sup>26</sup> We plan to write more about the role of the oil industry here.

<sup>27</sup> Interviews 9, 10 and 11

constitutes a leakage problem caused by compromises between CARB and the utility sector.<sup>28</sup> Moreover, critics claim that there is little reason for California to celebrate the cap-and-trade system as a cornerstone policy instrument as long as the bulk of the emissions cuts are addressed through traditional command-and-control regulations. In essence, these critics say, the climate policy package is carefully constructed to hide the marginal costs of climate action.<sup>29</sup> With a relatively low and stable carbon price in the cap-and-trade system attracting most attention, the much higher costs incurred by the less talked about RPS and LCSF are not so visible for the public.

Since the implementation of the cap-and-trade system, and increasingly in the second phase (2015-2017), revenue generated from cap-and-trade auctioning has filled up the Greenhouse Gas Reduction Fund substantially.<sup>30</sup> This has allowed the state government to support infrastructure investments, projects for disadvantaged communities and other low-carbon policies with fresh funding. According to our interviewees, the Governor and state legislative majority plan to use the proceeds to support green projects, and to build new infrastructure. These actors find it especially pertinent to use the proceeds to support low-income constituents in electoral districts where the Representative or Senator is in a swing-vote position. In other words, the intention is to use the proceeds strategically to build future support for even more ambitious climate policies.<sup>31</sup>

Other interviewees were critical to the way proceeds have been used so far. They question whether the supported projects really are green projects, and suspect that money is used to pay off potential critics of the cap-and-trade program, indicating that the process is shady.<sup>32</sup>

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<sup>28</sup> Interview 11

<sup>29</sup> Interviews 9, 10 and 11

<sup>30</sup> We plan to expand this discussion with facts and figures. This part of the cap-and-trade policy is quite innovative – although controversial, and could become a model for others.

<sup>31</sup> Interviews 2, 3, 6, 1 and 4

<sup>32</sup> Interview 10

Moreover, since California's constitution requires a 2/3 majority to change taxes, cap-and-trade were viewed by some interviewees as a way of circumventing this rule. They argued that a revenue neutral carbon tax combined with support for R&D would be a better approach, not least because that would relieve CARB from the role of creating a financial market that they have little experience in handling and controlling.<sup>33</sup>

### *Potential for linkage*

The linking of the California and Québec cap-and-trade programs expands the scope of the two systems. The goal for California's legislators and regulators is to expand the system further, and include more states and provinces that are considering cap-and-trade, like Ontario. Moreover, the Obama-administration's Clean Power Plan, if implemented, has the potential to drive some US states to develop new legislation for the implementation of cap-and-trade. Washington State is already considering this (EDF/IETA 2015). California engages in close discussions with US EPA and RGGI whether and how Clean Power Plan compliance plans can include linked carbon markets.<sup>34</sup>

According to our interviewees, two different views prevail among policymakers and experts regarding the potential for linking California's cap-and-trade with other systems.

On the one hand, the coalition of legislators, regulators and ENGOs see a good potential for linkage, emphasizing that other states or provinces can easily copy the design that California has developed.<sup>35</sup> Other states should introduce similar systems, and then link to the California cap-and-trade to achieve maximum cost-effectiveness in carbon emissions cuts. Not all

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<sup>33</sup> Interviews 9, 10 and 11

<sup>34</sup> Interview 1

<sup>35</sup> Interviews 5, 6, 1, 2, 3, 12 and 13

elements in linked cap-and-trade systems need to be exactly similar, but our interviewees underlined that it is especially important to keep the integrity of California's offset rules intact.<sup>36</sup> Linkage through common offset practices would be a good option.

The coalition regard the current regulations to be rigorous approach to ensure the environmental integrity of offsets that will be eligible to enter California's program. CARB is responsible for adopting protocols that set guidelines that individual projects must meet and that make accounting and other practices consistent across like projects. CARB has approved five protocols so far: ODS, livestock digesters, urban forests, US forest projects and mine methane capture (EDF/IETA 2015).

On the other hand, some carbon market experts are highly skeptical to the potential for linking California's cap-and-trade system to other US states.<sup>37</sup> Because California is a unique case in several respects, it is unlikely that other states in the US are able to adopt similar systems. First, the democratic majority in the state legislature is very strong and stable, and has a long history in being champions of environmental policy. This political landscape is not very common in other states. Second, California has very little coal left in its energy mix after policy reforms related to air pollution control caused a switch from coal to natural gas as the major source of electricity generation. Most other US states rely on coal for a much larger share of their power production. Third, public support for ambitious climate and environmental policy is very strong and stable, which is not the case in many other states. Fourth, and perhaps most significant, California has very strong competencies in regulatory agencies for developing complex and comprehensive environmental policies that has taken decades to develop. In sum, these experts claim that it is unlikely that neighboring states can easily copy California's climate policy package because they experience circumstances that

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<sup>36</sup> Interview 5

<sup>37</sup> Interviews 9, 10 and 11

are less benign for developing ambitious policy. This is significant because if various cap-and-trade systems cannot be linked, a situation with a balkanized global trading system could arise and most of the economic and environmental advantage of trading will be lost.

Furthermore, some interviewees claimed, existing linkages to Quebec and Ontario were created more to show off politically, while the environmental effect is very modest.<sup>38</sup>

## Conclusions

As California adopted AB 32 and started to develop its cap-and-trade program, regulators and politicians looked to other jurisdictions to learn from their experiences. Exchanges of knowledge with the EU ETS and RGGI shaped key design mechanisms, with the effect that California decided on a different design for allocation of permits and offset rules to avoid mistakes like over-allocation, double counting and windfall profits to permit holders. In the case of auctioning rules, however, California seem to have converged towards the RGGI model with establishing a fund for surplus auction revenue that is used for investment in additional low carbon projects. The effect of policy diffusion and learning was stronger in the early phase of developing the cap-and-trade than in later phases.

Despite the signature status of the trading system, in fact California mostly relies on much less transparent and more costly direct regulation – notably the RPS, energy efficiency measures, and the LCFS – to cut GHG emissions. Our findings indicate that the climate policy package was purposely designed for interaction between cap-and-trade and complementary direct regulation to avoid high permit prices in the cap-and-trade program, which would have caused political controversy. If allowance prices had been too high, protests could have

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<sup>38</sup> Interviews 9, 10 and 11

mounted against cap-and-trade and potentially jeopardized its continuance. Instead, the RPS and LCFS now take the brunt of the carbon emissions cuts, and represent the more costly policies without having a directly visible price for consumers. Overall, the climate policy package is built to gradually increase allowance prices, and gradually increase acceptance of cap-and-trade among stakeholder groups. Key stakeholders have played crucial roles in developing the specific design elements of the cap-and-trade system to make it work in the local context.

While on the surface California is integrating with other systems, notably Quebec's, the California cap-and-trade system develops mostly in its own special political context in later phases of system design. The adaption of the cap-and-trade program to local conditions and needs makes it more difficult to link with other carbon markets, since they too will have local contexts that need to be adjusted to. This raises questions about how emissions trading systems will achieve more effectiveness and more cross-border trading, as many analysts have claimed and hoped. Linking carbon markets effectively and without carbon leakage can be a very challenging exercise.



## **Annex: List of interviews performed in Sacramento and San Francisco, October 2015:**

Interview 1: California Democratic State Senator, 13 October 2015.

Interview 2: Legislative Assistant for the California State Senate Energy, Utilities and Communications Committee, 13 October 2015.

Interview 3: Legislative Assistant for Democratic State Senator, 13 October 2015.

Interview 4: Legislative Assistant for Democratic State Senator, 13 October 2015.

Interview 5: California Air Resources Board, 12 October 2015.

Interview 6: California Energy Commission, 12 October 2015.

Interview 7: California Independent System Operator, 12 October 2015.

Interview 8: Statkraft San Francisco office representative, 14 October 2015.

Interview 9: Legal scholar, Stanford University, 14 October 2015.

Interview 10: Researchers, Hoover Institute, 14 October 2015.

Interview 11: Legal scholar, University of Berkeley, 11 October 2015.

Interview 12: NextGen, 15 October 2015.

Interview 13: NRDC, 15 October 2015.

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