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## **Managing Environmental Risks through Private Sector Cooperation: Theory, Experience and a Case Study of the California Code of Sustainable Winegrowing Practices**

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### **Abstract**

There is growing interest in voluntary agreements as an economic policy tool for managing environmental risks. Numerous studies have been published about the theory of such arrangements, how they work, and what they accomplish. They demonstrate that voluntary agreements can create value for both regulators and firms. Little has been written, however, that analyzes various voluntary arrangements in the winegrowing sector. The evidence accumulated from other sectors indicates that efforts in the winegrowing sector may be following an appropriate path for attaining management objectives. The California Sustainable Winegrowing Practices (SWP) project indicates a number of strategies that may be useful in developing voluntary agreements in other regions. The recommendations include using an integrated approach with the initiative from the bottom toward the top, involving interest groups early in the process, and evaluating the need for a certification program.

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## **Introduction**

Winegrowers, and the organizations that regulate them, are increasingly aware of the links between grape and wine production and environmental outcomes, particularly land, soil and air degradation. The industry has responded to this awareness by organizing environmental risk management initiatives in numerous countries including France, Italy, South Africa, New Zealand, Australia, Argentina, and the United States. The OIV (International Organization of Vines and Wines) is currently considering a Resolution (CST/03/252) which addresses the issues of sustainable development on a global scale. This paper reviews studies of voluntary environmental management programs and examines the California winegrowers' experience to find lessons that might be useful to winegrowers and governments in other areas. The focus of this paper is on the method for involving winegrowers and the broader community in evaluating existing practices, organizing educational efforts and establishing standards for sustainable production practices. The method may be appropriate for other areas even if the final set of standards differs to conform to local conditions.

Voluntary environmental management programs have emerged in numerous industries and countries as alternatives to mandatory environmental regulations. Rivera (2002) identifies three classes of voluntary programs: (1) public voluntary programs established by governments to encourage improved practices (e.g. the Eco-Management and Audit Scheme of the EU, 1993); (2) negotiated schemes between government and firms; and (3) unilateral initiatives established by industry associations or third-party organizations. California growers and wineries initiated a voluntary environmental program in collaboration with community interest groups and government agencies. This effort produced The California Code of Sustainable Winegrowing Practices (SWP). This initiative fits into Riviera's third class, even though government representatives were involved early on.

As well as describing the creation of the SWP, in this paper we consider what design considerations can increase the environmental benefits of voluntary agreements and draw lessons for winegrowing firms and governments that regulate them. This discussion can draw no definitive conclusion about whether the SWP, or programs like it, will provide greater environmental protection than other forms of regulation. In general, no a priori prediction can be made about the relative cost effectiveness of voluntary agreements and other forms of regulation (Sergeson and Micheli 1998) because analysts do not know what environmental targets regulators might have chosen or the instruments they would have selected to meet these targets. Further, the extent to which firms participate in voluntary programs determines the environmental benefits of these agreements, and thus their value to regulators or society at large.

It is too early to evaluate or critique the SWP's performance in fostering the adoption of sustainable practices. The ultimate test will be the extent to which this program has contributed to environmental protection, and thus social welfare, and at what cost. An empirical analysis comparing environmental performance before the SWP and after would be the best means for policy makers and the industry to evaluate the cost effectiveness of this effort.

The remainder of this paper is organized as follows: Section 2 reviews the theory and experience of voluntary environmental programs that have been used in the past. We use this review to draw some general lessons about what value firms can capture from these programs and what design characteristics can make the agreements more valuable. Section 3 examines the California program. We consider what circumstances made agreement to a code of conduct possible, and whether the SWP is likely to bring value to firms. Section 4 provides some lessons for firms from the SWP and experience elsewhere about when and how voluntary environmental agreements can be valuable. Section 5 addresses the broader social concern of how voluntary agreements can be designed that achieve cost-effective environmental protection.

## **Theory and Experience of Voluntary Environmental Agreements**

While voluntary codes of conduct are new to the wine industry in California, voluntary regulatory agreements, including information disclosure programs, voluntary pollution reduction or environmental management programs, and eco-labeling or certification programs have been widely used in other industries. In this section we review both theoretical and empirical research that has been conducted to understand why this form of environmental management may be attractive to firms and actual or potential regulators, and when this form of management may be most effective. This review suggests that cost-effective management of environmental performance using voluntary measures depends on which firms participate, what investments or reductions these firms actually make, and the gains associated with reduced costs from flexible implementation that might be lost under formal command-and-control regulation with attendant confrontation and litigation. This review suggests that the most effective voluntary programs target industries whose customers value good environmental performance and provide a means for firms to credibly signal their environmental performance.

Voluntary environmental programs gained some popularity in the United States (U.S) in the 1990s for the regulation of a wide range of pollutants created by manufacturing firms. As of the year 2000, there were over 10 such programs in that country. The first voluntary environmental program used by the U.S. Environmental Protection Agency (USEPA) was the well-known 33/50 program for toxic pollutants which concluded in 1995 (USEPA 1999). While programs vary widely, generally voluntary programs create a framework in which firms (1)

volunteer to reduce emissions, though there is no penalty for delay or renegeing on a commitment, (2) disclose their environmental performance or emissions, and (3) participate in a process to share information about environmental practices (Karamanous 2001, Videras and Alberini 2000).

Other voluntary environmental programs include national and international certification programs, such as ISO 14000, a framework for environmental management leading to third party certification, (ISO, 2002) and Costa Rica's certification for sustainable tourism (Rivera 2002).<sup>1</sup> Certification programs such as these create a series of practices that participating firms chose to adopt or targets that they chose to meet. Upon verification that these have been achieved, external auditors then certify each firm's accomplishment. Firms are then free to publicize the fact that they have been certified.

The success of these programs, as measured by their effect on environmental outcomes relative to what was being achieved in the absence of regulation, depends on whether firms choose to participate and thus over-comply with legal requirements. Empirical evidence suggests that firms have found it profitable to participate in voluntary programs for a variety of reasons. First, access to information from the EPA and other companies can allow firms to gain information about abatement practices that otherwise might be more costly to obtain. Second, firms may perceive themselves to be in a strategic game with regulators. If there is some threat of impending regulation that will impose technology or emissions standards on firms, voluntary programs can allow firms to avoid or delay the implementation of this formal regulation.<sup>2</sup> Well known results show that traditional command-and-control regulation can be more costly for industries than flexible forms of regulation that allows firms to choose different abatement technologies (Oates, Portney, and McGartland 1989). Capital markets may award lower borrowing cost to firms that provide environmental performance information (Konar and Cohen 1997, Foulon, Lanoie and Laplante 2002). Firms may also capture a premium in their output market if they can credibly advertise that they are good environmental performers (Arora and Gangopadhyay 1995). We consider this aspect of voluntary environmental agreements further below.

It is somewhat more surprising that regulators have found voluntary environmental programs attractive. At the outset of these programs, regulators do not know the environmental benefits that they will bring, and the gains that they do bring may

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<sup>1</sup> Some countries, including Japan, accomplish selected environmental regulation goals by creating a framework for firm-by-firm performance agreements with regulators (see Welsch and Hibiki 2002). We exclude these agreements from our review.

<sup>2</sup> Alternatively, voluntary over-compliance may encourage regulators to tighten environmental standards, thus creating barriers to entry for the industry.

be less than could be achieved under formal regulation.<sup>3</sup> However, these programs are relatively less costly for regulators managing limited enforcement budgets than traditional regulation. Thus, the benefit per regulatory dollar spent may be high. This is especially true in the U.S. where litigation is common. Regulators may also find voluntary agreements to be attractive in a context where there is little political appetite for additional formal regulation (Karamanos 2001).

Before turning to the question of whether voluntary agreements result in efficient environmental protection, the profile of participating firms must be determined. Obviously, firm participation will be determined by the make-up of the relevant industry and the nature of voluntary program, but there is some empirical evidence about the sort of firms that find over-compliance and voluntary environmental programs profitable (see Arora and Cason 1995, Nakamura, Takahasi and Vertinsky 2001, Videras and Alberini 2000, Rivera 2002). Evidence from the 33/50 program, as well as other voluntary programs where firms publicly commit to improving performance and disclose their progress, suggests that larger firms, more pollution intensive firms, and firms in more concentrated industries choose to participate.<sup>4</sup> These are firms whose behavior can be most easily monitored by civil society groups and regulators. Firms with a lower cost of abatement (as suggested by the amount of money they spend on research and development) and more financially healthy firms are also more likely to participate. These are the firms most able to afford reductions. There is also evidence that firms with more customer contact and more intra-industry contact (as measured by membership in trade associations) are more likely to voluntarily improve their environmental performance. These are the firms that are more likely to capture a “green” premium for good performance, or be hurt by negative publicity or pressure from their peers.

The profile of participating firms and the design of successful programs reviewed above suggest that voluntary agreements can create value for firms and be a relatively efficient method for environmental protection. The greater the value created by good environmental performance, the more effective a voluntary agreement will be in changing firm behavior. Value is likely to be highest when firms are rewarded for good environmental performance, whether by capital markets, their peers, or consumers, when firms can afford to make environmental investments, and when they perceive a threat of future costly formal regulation.

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<sup>3</sup> Note that voluntary agreements differ in this respect from cost-sharing programs that have been used in agriculture. These programs commit a monetary budget to achieving environmental goals and, with appropriate data about growers’ costs and outside opportunities, the impact of a program can be predicted *ex ante*.

<sup>4</sup> This firm profile suggests that emissions reductions from voluntary programs can be substantial, but it does not guarantee that this is a cost-effective means of achieving environmental goals or that voluntary environmental programs provide adequate protection of the environment.

For a given industry profile, the most important design consideration is whether a voluntary agreement will allow firms to credibly show that they have undertaken improvements and allow consumers and other interest groups to identify which firms have changed their behavior. Voluntary agreements are vulnerable to “free-riding;” firms have an incentive to claim that they have undertaken pollution reductions that they have not actually made. The most effective programs will have mechanisms that discourage this behavior. These mechanisms include information disclosure programs, third party certification and peer pressure. Information programs and third party certification allow consumers and others to identify those firms that are actually participating in the program. Peer pressure is a more indirect method by which firms may be discouraged from free-riding. Precisely because of free-riding concerns, publicizing only industry-wide information or leaving other opportunities open for firms to claim better performance may lower the effectiveness of a voluntary environmental agreement.

## **The California Experience**

Major segments of the global grape and wine industry have used their agrarian roots to design an image for wine consumers that may well be enhanced by increased social and environmental investment. Advertisements often feature beautiful vineyards highlighting viticultural regions of origin and publicity often emphasizes the natural conditions under which grapes and wine are produced. This link to the natural environment provides an opportunity to gain recognition for protecting it and to earn potential price premiums or other market advantages. This marketing strategy and history provides a rationale for the sustainable winegrowing program in California.

The California Code of Sustainable Winegrowing Practices (SWP) is a comprehensive program encompassing research, education, farming and processing activities, self-evaluation techniques, and a community forum to identify and resolve environmental and social concerns. The SWP was developed under the leadership of the Sustainable Winegrower Joint Committee and is one product of Wine Vision, a national strategic planning effort involving industry, educators, community groups and others.<sup>5</sup> This arrangement places SWP within the context of other forces affecting the industry and emphasizes the need to evaluate the complex inter-relationships between wineries, grape production, the environment, and society. The joint committee is composed of almost 50 members from the Wine Institute, the California Association of Winegrape Growers and other interest

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<sup>5</sup> The ideas giving rise to the California SWP are not unique. They stem in part from the Australian initiative and others cited earlier and have evolved following a course similar to that taken in the Champagne region in France beginning in the 1980s (Moncomble, 2003). The SWP joint committee's objectives are comparable to those of "le groupe national paysages viticoles" under the auspices of ITV (Centre Technique Interprofessionnel de la vigne et du vin) in France which is composed of about 20 persons from diverse public and private backgrounds.

groups, including government. It developed the framework of the SWP project starting in June 2001 with the intent of producing a workbook guiding winegrowers toward sustainable practices. An important element of the SWP process was to involve other groups as close as possible to the start of writing and editing. Contributors outside of industry included Nature Conservancy, Latino Issues Forum, three state and two federal agencies, consultants and university professionals.

The Code of Sustainable Winegrowing Practices Workbook (Wine Institute 2002) compiled by the joint committee and its designated staff, defines sustainable winegrowing as a set of practices that are “environmentally sound, socially equitable and economically feasible.” The practices are derived from numerous cited sources, predominantly from academic and related professional publications concerning science, policy and regulation. Other citations are to interest group publications (17 percent), government (10 percent) and industry and trade sources (10 percent). In addition the workbook provides a list of almost 300 resource sites where winegrowers can obtain additional information about government regulations and new sustainable practices, such as waste disposal techniques, pollution friendly packaging, sprayer calibration, and erosion control systems. The composition of the joint committee and its staff and the diversity of inputs and reviewers suggest that the components of "best" practices are reasonably valid. As in other voluntary agreements, it is difficult to compare the SWP to the practices formal regulators might have mandated under a "command and control" environmental policy. This information provision element of the SWP is analogous to the efforts by regulators to provide information about pollution reduction possibilities in other voluntary environmental agreements used in other industries.

The centerpiece of the Workbook is a format that permits growers and vintners to rate themselves as to the sustainability of their practices and to plan for future changes. These self-assessments are made voluntarily and when collected and analyzed provide a snapshot of how growers and vintners are performing now and how they might perform in the future. Of course, current performance could be more positive than communities believed, or could be more negative. There is no explicit penalty for supplying incorrect information about practices chosen now or in the future.

The Workbook does not specify the costs of achieving sustainable practices. It provides a framework for winegrowers to estimate costs, but ultimately the decision about adoption will depend on the magnitude of cost increases (or savings) and other considerations. Results from other voluntary programs and formal regulation experiences indicate that increased environmental protection requires more money than existing practices. The self-assessment feature of SWP guides winegrowers to evaluate all aspect of their existing practices. This process could lead to improved efficiency, and lower costs, in some areas, but there is no evidence that these

efficiencies will fully offset the added cost of sustainable practices. If so, experience suggests that more winegrowers will participate if the threat of even more costly government regulations is strong, or if there is a certification program that generates price premium or other market advantage. Currently, SWP does not include a certification program.

The SWP project goes beyond obvious environmental considerations such as land erosion, pollution, and worker safety. It includes consideration of energy efficiency, packaging, sustainable employee practices, and relations with neighbors and the community. An important element is the establishment of an ongoing forum, through the Joint Committee, the SWP educational program, and greater community participation as outlined in the Workbook. This encourages a continuing exchange of views and adaptations as environmental, economic, and social conditions change which may provide a more effective means of managing environmental risk than ad hoc arrangements to deal with problems after they have arisen.

The Workbook defines 13 categories of management practices, four applying only to vineyards, two applying only to wineries and seven applying to both. The categories are:

- Viticulture
- Winery water conservation and quality
- Soil management
- Materials handling
- Vineyard water management
- Solid waste reduction and management
- Pest management
- Environmentally-preferred purchasing
- Wine quality
- Human resources
- Eco-systems management
- Neighbors and communities
- Energy efficiency

Each of the categories includes an array of relevant practices or criteria to assess sustainability. For example, the pest management category contains 38 criteria including monitoring, weed knowledge, herbicide choice, training employees, and coverage. The human resource category includes 16 criteria such as staffing and recruiting strategy, safety training and sustainability bonus systems. Altogether, the workbook describes 216 criteria for the 13 categories. For each of the criteria the workbook lists four levels of conformance leading toward sustainability. The first level indicates minimum conformance to the practice and the fourth level indicates



full conformance.<sup>6</sup> Winegrowers use these four levels to assess their practices and identify areas for improvement.

## **Lessons for Winegrowing Industries**

1. An integrated approach is likely to improve effectiveness, but improved performance will not be free. SWP is unique among some voluntary programs in taking a "ground to glass" approach rather than focusing solely on one aspect or level within the production-processing-distribution continuum. When the relationships between various practices are understood, this may lead to more efficient (less costly) ways to combine resources. For example, better water management may generate funds that can be used for more environmentally friendly IPM practices. Some sustainable practices may require more frequent personal attention in the vineyard or winery. This can result in better supervision or accomplishment of other production practices.

This is not to say that firms' can change their production processes to become more "sustainable" as defined by a code of conduct, without increased costs. Free lunches, or "win-win" technology adoption opportunities, may be quickly exhausted. Accepting increased production costs to become more sustainable may be appropriate for firms however if they perceive value from more sustainable choices. Interviews suggest that there are incentives to accept some level of increased production costs: (1) SWP is a way to differentiate and improve the product; (2) SWP is the right thing to do (perhaps a life-style or social conscience choice); and (3) SWP will avoid worse and more costly regulations in future. If value is realized from adoption of improved practices it is possible that an integrated approach will lead to conflicts about the distribution of benefits among different levels represented in the program. This has yet to be a problem in California. If it becomes a problem, it may well be worked out through ongoing negotiations between wineries and growers.

2. Early involvement of interest groups may increase the chances of successfully agreeing to a credible code of conduct. Strong and continuing leadership from within the winegrowing sector was necessary to attract widespread participation in the SWP project. Collaborators were involved in formative discussions and were asked to critically review sections of interest to them. The key is to get such involvement early. The project must not be presented in apparently completed form with requests for comment. It must be a grass-root effort, from the ground up.

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<sup>6</sup> For example, in the water management category under the off-site water movement criterion, the lowest conformance is where drainage systems are not in place that minimize off-site movement of silt or chemicals. The highest level is achieved when irrigation practices create no runoff; cover crops prevent rainfall runoff, drainage systems are in place to minimize off-site movement in the event of storms and any soil permeability problems have been addressed.

3. The key to this project is self-evaluation. SWP allows participants to voluntarily assess the sustainability of their practices against standards that have been developed through cooperation within the SWP project. It helps the "audience" identify areas of excellence and those that need improvement. It allows individuals and groups to identify relevant action plans. The results of the self-evaluation reports are being used to establish a benchmark of current practices against which to measure future changes. The benchmark has an advantage of providing relatively quantitative evidence on existing practices that may defuse sweeping allegations of environmental damage or underline the need for rapid change. The design of the self-evaluation process allows winegrowers to assess where they are along the scale of environmental protection for each of their practices and to identify those areas where change might be beneficial.

4. A certification system need not be essential in gaining agreement on a code of conduct but may be an effective means for adding value to the product. SWP does not provide a certification seal or other visual evidence that winegrowers have adopted sustainable practices. The experience so far is that participation in the program has not been hampered by this lack of recognition. However, in the longer term some sort of certification might be desirable if it allows participants to gain a market advantage.

The experience of other programs suggests that certification is a valuable marketing tool. This value can compensate firms for the cost of improving their environmental performance. Credible certification means that firms cannot falsely claim to be good performers. Thus, it helps reduce the free-rider problem but need not compel participation. Firms may choose not to enroll in a certification program though this action in itself sends information that might influence consumers or capital markets. In the end, firms need to weigh carefully the possibility of formal regulation in the event that voluntary codes of conduct, with or without certification, are not agreed to.

5. Voluntary SWP programs cannot please everyone. There is some resistance from California winegrowers who fear that putting things on paper (e.g. the SWP workbook) will lead to adoption of the practices by government as the only allowable process. This worries them more than the likelihood that the SWP might forestall more onerous regulations. Some environmental or community groups may not participate in hopes that government will adopt even stricter regulation. A voluntary program is unlikely to satisfy either one of these sub-groups. Empirical evidence shows that fear of stricter government regulation often motivates participation in voluntary programs in the belief that such programs will forestall further regulation.

## **Implications for Governments**

1. Voluntary programs are an economic alternative for managing environmental risks in some situations. Regulators working in the context of limited budgets and a political environment where there is little appetite for additional formal regulation may be able to use or encourage the adoption of voluntary agreements to generate environmental benefits. However, there is no a priori reason to expect that voluntary environmental agreements will achieve the socially desirable level of environmental protection. Each situation needs to be evaluated on its own merits including how a voluntary agreement might mesh with existing regulation. From the government's perspective, this means that voluntary agreements may be appropriate in specific situations as a complement to formal regulations, but not as a replacement for them.

2. Voluntary agreements are most effective when more firms participate and improve environmental performance. The greater the value created by good environmental performance, the more effective a voluntary agreement will be in changing firm behavior. The benefit to the environment is likely to be high when firms are rewarded for good environmental performance, whether by capital markets, their peers, or consumers, when firms have sufficient resources to make environmental investments, and when they perceive a threat of costly mandatory regulation in the future. Governments may consider providing resources for third-party certification and information disclosure. They may also encourage firms to agree to codes of conduct that limit the opportunities for free-riding.

3. Free-riding reduces participation and thus environmental benefits. Policing free-riding can be accomplished by information disclosure programs, third-party certification or by peer pressure. Once firms agree to participate in a voluntary agreement, requiring them to publish information about their performance allows consumers to identify firms that have improved their performance. Simply providing a mechanism for information disclosure can also encourage improved performance, perhaps because firms anticipate a reaction by capital markets to the failure to disclose.

4. Credible standards may make the environmental benefits of voluntary agreements larger. When environmental codes of conduct are decided, it is important that standards reflect environmental goals rather than political or financial considerations alone. Regulators may encourage the participation of academics or other experts when goals and targets are decided.

5. Bottom-up initiatives can be effective. Though it is a relatively unfamiliar role, governments might succeed better by stimulating industry and interest group initiative rather than taking the initiative itself. Bottom-up initiatives can be perceived as reasonable and sensitive to firms' economic realities.

6. Voluntary systems may reduce the risk of trade barriers. SWP may provide a means to defend against trade barriers erected on environmental grounds. This is a sensitive issue in the United States, which does not adhere to the Kyoto Treaty on environmental protection. The scientific nature of the voluntary SWP and the benchmark data provided by it could offset complaints if adherents to the treaty were to erect barriers against non-Kyoto traders on the grounds of inadequate practices.

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