

Piloting electrification of vehicles used by winegrowers in Sonoma

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Is the project a case of...:

- State-initiated co-creation
- Entrepreneur-driven co-creation
- Grassroots-based co-creation*

**For an elaboration of the typology, please consult the GOGREEN theoretical framework p. 25.*

Integrated case analysis

Before proceeding to the scoring of the GFs, please provide a 3–5 page case analysis in which you describe the background, history, and national, regional, and local contexts of the case, the problems and goals addressed by the local collaboration, the participating actors and their relationships, the unfolding of the co-creation process, the most important governance factors (this may include factors other than those in focus in this project), and the generated outputs and outcomes. The conclusion may specify a few lessons learned from the case study.

1) Background, history, and national, regional, and local contexts of the case

Sonoma County is one of the most important wine producing regions in the US and is located right next to the world-famous wine producing area, the Napa Valley. Around 60,000 acres are covered with vines and a large part of the population is working with grape growing and wine making. Regarding ownership and size, 95% of the vineyards are family owned and 80% of the vineyards are less than 100 acres, while 40% are less than 20 acres. There are 495 wineries producing, 70% of the wineries produce less than 6,000 cases of wine per year, and there are as many as 19 different viticultural areas (micro-climates) also called AVAs in Sonoma. Chardonnay is the most planted grape (26%), and Pinot Noir and Cabernet Sauvignon come in second, with 22% each.

The Sonoma County Winegrowers (SCW) was formed in 2006. It is a quasi-public agricultural commission authorized by the Californian Legislature to serve as a marketing organization for all winegrowers in Sonoma County. The organization is authorized to represent and collect an assessment from all farmers in the county, and to use the funding for marketing purposes only. It operates under the oversight of the California Department of Food and Agriculture. It was originally endorsed as a commission by the winegrowers through a 'yes' referendum to a proposition petitioned to the Department of Food and Agriculture. The proposition came from influential members of its organizational predecessor – a voluntary organization named Sonoma County Grape Growers Association. Some of the leaders of that association still play an important but informal role in the leadership of SCW. The status of being a commission is renewed at regular intervals through a referendum among all the grape growers. There are three other similar agricultural commissions in California, but SCW is the only one that ties marketing to sustainability.

The SCW is governed by a board and an executive committee. It also has a small staff of around 6 people that are for the most part specialized in marketing. The organization is headed by a president who is hired by and reports to the board.

The formation of the SCW builds on a long tradition for informal collaboration between the local wine growers. This collaborative tradition is also a product of the fact that Sonoma County is located close to the Bay Area, which has a tradition for local community activism. Politically, the population tends to be politically liberal. According to its mission statement, SCW's overall goal is to increase the value of grapes while nurturing and protecting sustainable agriculture for future generations. This mission statement indicates that SCW has a broad perception of what marketing entails. In addition to marketing Sonoma grapes through a link to sustainability, SCW trains the workers, hosts workshops for farmers on agricultural techniques, and arranges all sorts of social events for the farmers. Moreover, they build partnerships with stakeholders within the county as well as beyond, and the focus is increasingly on reaching national and international markets. This entails forming relationships with organizations and businesses on a much larger scale than themselves. Among such organizations and businesses are Ford Motors, Houston Rockets (a famous basketball team), Landry's (a restaurant and entertainment company with over 60 restaurant concepts), the baseball team, SF Giants, and the iconic tractor producer John Deere. As a part of the marketing endeavors, SCW is strongly engaged in promoting social sustainability among the workforce of predominantly Mexican immigrant workers. It has established a private non-profit foundation that promotes the wellbeing of the workers with a focus on housing, healthcare and other important social factors. A recent development is the establishment of the Leadership Academy funded by a foundation named "Voice of the Vineyards" The academy aims to develop the leadership skills of selected workers. The workers also participate in branding the SCW.

In 2014, SCW made sustainability a key element in their marketing strategy when it decided to aspire to become the most sustainable winegrowing region in the world. According to one of the leaders the questions they asked themselves was: "1) *How do we get the Governor of CA to recognize our local grape growers as leaders in conservation/sustainability?* 2) *What headlines do we want to see about farming, wine grapes and the wine industry in our local paper in 10 years?* and 3) *what headlines do we NOT want to see about farming, wine grapes and the wine industry in our local paper in 10 years?*". Enhancement of sustainability became the strategic answer to these questions. Instead of creating its own sustainability certification program specific to Sonoma County, SCW started out on this new journey by adopting the certification for sustainable winegrowing introduced by the Californian Sustainable Winegrowing Alliance (CSWA)— a collaboration between California Association of Wine Grape Growers and The Wine Institute (<https://www.sustainablewinegrowing.org/certified-sustainable-winegrowing.php>), Lodi Rules, Fish Friendly Farming, and Sustainability in Practice. These four certifications from around the state included a similar set of best management practices. CSWA was the most widely adopted program and it lists 140 different sustainable management practices and requires farmers to document continuous improvement and subject themselves to 3rd party auditing. All of the four certification programs that were accepted under the "Sonoma County Sustainable" umbrella were triple bottom line, required third-party audits and continuous improvements. The certification measures combine concerns for environmental sustainability with concerns for social and economic sustainability. Today, 99% of all the wine growers in Sonoma are

certified. The successful introduction of the certification scheme generated a taste for more sustainability initiatives.

In 2020, SCW formed a partnership with the California Land Stewardship Institute around a pilot project testing a climate adaptation certificate involving 17 local vineyards. Core goals were to improve soil quality by reducing the use of herbicides and pesticides and conserving water while increasing the use of organic compost and cover crops. Another goal was to test methods for measuring the impact of new agricultural methods on soil quality and carbon sequestration. As noted by one of the pilot-farmers, the concern for soil quality is strong among family farmers, who are in it for the long haul: *“My father was caring for the land to make sure my brother and I had something to farm. If he did something detrimental to the ranch or to the soil, we would have nothing”*. Each pilot-farm created its own land management program for promoting the sequestration of nitrous oxide and carbon emissions in a way that fits its circumstances and challenges. The greenhouse gas reductions made in the test-farms proved to be significant. The successful pilot project inspired the initiation of new partnerships around the promotion of soil quality, reduction in the use of pesticides and the promotion of carbon sequestration. Among them is a partnership with the global company Wilbur Ellis that sells chemicals such as fertilizers, pesticides and other products used in agriculture. The new project involves 7 pilot farms and, according to a survey conducted in 2023 another 45 farmers are interested in participating in this or another pilot project.

In 2021 SCW initiated the vehicle electrification project that we decided to pay special attention to in this GOGREEN case study. This pilot project aimed to test the prospects for electrifying the many vehicles that wine farmers use. The project was co-created between SCW, a branch of Ford Motors called Ford Pro that specializes in serving business customers, and three Sonoma test-farms – Bevill Vinyard Management, Vino Farms and Dutton Ranch. The three test farms grow grapes across 4,000 acres and use many vehicles. Ford Pro supplied the test farmers with an electric F-150LightningPro pickup, an E-Transit cargo van, and charging stations, which for the most part is powered by solar panels. Moreover, they provided a software package for installment in the electric vehicles as well as in the gas-driven vehicles of different makers that were in use. The purpose of the software was to give the farmers access to important data relevant for maintaining their cars and for monitoring idleness and vehicle downtime, thus informing efforts to lower operating costs and purposeless CO2 emissions. Other actors, such as Wilbur-Ellis, business was at various points in time involved in the project but not really part of the co-creation process. Sonoma County Council, the Sonoma County Transportation Authority, and the Regional Climate Protection Authority backed the project that fit into their overall policy aspirations but did not take an active part beyond participating in a few meetings and having bilateral discussions with the SCW president. The nine municipalities in Sonoma County were not involved.

2) The aims of the electrification project and the sustainability problems it seeks to address

For SCW, the aim of the pilot project was to further advance the environmental sustainability of wine growing in Sonoma County to further strengthen its new marketing narrative. Moreover, a partnership with a major business player like Ford Motors enhanced SCW’s credibility as professional and capable partner in the eyes of other large organizations and business. For the pilot farmers, the aim was mainly to further explore whether electrification could reduce expenses and enhance productivity, although it was also to some extent to avoid causing further acceleration of the trajectory towards droughts and wildfires caused by climate change. For Ford Pro, the goal was to learn from the test-farmers in its efforts to develop

products that meet the specific needs of farmers, although it constitutes a very little target group compared to package delivery services like FedEx or Amazon. Ford Pro was particularly interested in testing the possibilities of creating a market for their software equipment. In addition, the collaboration with SWG and the test-farms was a valuable showcase for marketing Ford Pro as a responsible business with a green profile.

3) The participants and their interaction and communication in and between meetings

From the beginning, there was close dialogue between the participants co-creating the electrification project. In the initiation and planning phase, the dialogue between Ford Pro and the leadership of SCW was relatively intense. There were several phone calls and online meetings every week. In those conversations, SWG and Ford Pro clarified mutual interdependencies and drew the contours of a joint project.

The next step was when Ford Pro sent a delegation of high-ranking people to Sonoma to visit some of the wine growers. This is when the detailing of the project design began and the three test farms were recruited. From this stage onwards, most of the dialogue took place between the individual farmers and the technicians at Ford Pro. The focus was on practicalities related to the use of the electric cars and the software in the everyday life at the farms. There were weekly contacts and on several occasions the technicians came out and conducted observations and deliberated pressing matters with the farmers on location. They engaged in a joint effort to identify problems and to search for workable solutions. Ford Motors also used those deliberations to test new ideas.

One of the test farmers remembers that a team of software guys and engineers showed up during harvest: *“They spent three days with each of us [the test farms]. Each night they were out in the fields, watching how we harvested, watching the machine harvesting. (...). And they came with all sorts of sketches and ideas saying “well, we noticed this, would it be of value to you if we provided this? I said, no. Okay, and they threw that away. Then they had something else. Would this be of any value? And I said, no. Okay, and they threw that away. And then they circled back and started again until they proposed something where I said: “that might be something” and then we tried that”*. Solutions were co-created in this way.

To sum up, the first co-creation outcome was produced at leadership level and was a joint project narrative and design. The second outcome was the development and testing of innovative prototypes for the use of software and electric vehicles in farming by the people on the ground. A third outcome relates to the environmental impact of the electrification project.

4) The role and forms of knowledge sharing, coordination and joint problem solving

Knowledge sharing about how to promote sustainable farming, coordination of different initiatives and collaborative efforts to solve challenging problems are all key ingredients in the way SCW generally works. The collaborative strategy is to bring a group of relevant and affected people together in a joint effort to better understand a problem, to brainstorm possible solutions and ideas and consider how to implement them. It is also a way to build partnerships and coalitions and to create support for concrete initiatives.

This collaborative approach is characteristic for how the organization operates internally. A network of key actors in the leadership group is in constant dialogue with each other, and people from this network are

in close dialogue with the local farmers. This activity is illustrated by the many formal and informal leadership meetings, and the huge number of social events and training workshops for farmers.

The collaborative approach is also significant for SCW's interaction with external actors, such as government agencies, businesses, and organizations. They are constantly exploring opportunities for forming partnerships by forming different institutional platforms that support collaborative endeavors. For the last couple of years, SCW has hosted a bi-annual task force meeting with analysts and academics with insights about marketing and/or sustainable agriculture. The task force meetings were first launched as an activity under "Sonoma County Center for Ag Sustainability" (SCCAG) nicknamed the Ag Center, that SCWG use as a way of framing different innovation purposes. In 2023, SCW hosted the first Farm of the Future Summit in Healdsburg. It brought together 40 stakeholders, primarily from the private sector, to discuss the future of agriculture and to stimulate the formation of new partnerships around sustainable farming.

Internal and external knowledge sharing, coordination and joint problem solving is also characteristic of the way the electrification project was conducted. As described above, Ford Pro, the SCWs leadership and the test farmers were in close dialogue in all the different phases of the project in a joint effort to exchange information, coordinate initiatives and collaborate to solve emerging challenges.

5) The relation between consensus and conflict and the handling of the latter

The SCW saw the opportunity to have wineries sponsor their marketing efforts given that both wine growers and wineries shared the benefits thus avoiding a potential conflict. Moreover, coordinating efforts to market Sonoma wines would make it efficient and institutionalizing the collaboration would promote mutual understanding. Therefore, they invited the wineries to support the work of the SCW by becoming members of a branding organization called the SCW Winery Collaborative that unites winegrowers in the SCW with vintners and wineries in a joint effort to market Sonoma grapes and wine. Today the organization has 50 wineries as members. This way of turning potential tensions into a constructive force in moving forward is characteristic for SCW.

Another potential conflict was avoided in the same manner. A lot of farmers drive other trucks than Fords and could feel excluded from the project. Therefore, it was decided to offer the software package to those who had other makes to prevent them from feeling excluded.

There are also conflicts that are left unresolved. One such conflict is with an agricultural labor union and concerns about overtime payment. The union successfully lobbied for lawlike regulations demanding a rise in overtime payment, which meant that the farmers are now inclined to hire more workers at harvest time and other peak seasons instead of using their existing staff because they cannot afford to pay overtime. This is to the regret of both workers and farmers. The existing staff would prefer to work longer hours to earn extra money just as it is much more attractive to the farmers to use their trained staff than to hire someone without knowledge of how things are done at their farm. It seems that there is limited tradition for collaborating with unions on labor-related issues. SCW cannot collaborate or negotiate with unions.

6) The role and form of leadership: lead actor, steering group and/or shared leadership

SCW is formally governed by a board composed of 20 farmers elected for up to four two-year terms. The board appoints one of its members as chair and hires a president who basically runs the SCW and is its

public face. There is also an executive steering committee with 10 members. A member of the executive committee explains: *“Technically, it's the chairman who gets to select who he or she would have on the executive, in addition to the Vice Chair, Treasurer and Secretary of the Board. But the way it's sort of worked out, it typically that it is those most active people who have ideas about the organization, and who once were or currently are, board members, but it pretty much consists of past chairmen”*.

The incumbent president has worked in SCW since 2012. She started out as marketing director before she was appointed president in 2013. She can be characterized as a both entrepreneurial and powerful lead actor with a strong followership. In 2018, she received the CAWG leadership award from the California Association of Winegrape Growers, and in 2021, she received Congressman Thompson's Woman of the Year award. She has also received a prestigious travel fellowship. She has a noteworthy capacity for mobilizing support and forming networks with resourceful people. Her philosophy is: *“Say yes and get into the room”*. This was exactly what she did when she initiated the vehicle electrification project.

The president is actively using the board as a forum for achieving a solid understanding of what local farmers think and feel and for exploring how the farmers are likely to interpret and react to different initiatives. At the board meetings, she reports on ongoing activities and presents different ideas and projects that she plans to launch. The communication at the meetings is star-shaped – she introduces the topics on the agenda, and responds to comments from the individual members, but there is not much dialogue between the members. She gets inspiration to develop new ideas from an informal inner circle of influential farmers, and the executive committee. The task force of external experts and other platforms such as the 2023 Healdsburg summit serves the same purpose.

7) The temporal unfolding of the co-creation process: major shifts and ups and downs

As the electrification project evolved, it soon became clear that there were many challenges. One bump on the way was that the grape farmers did not really use the electric van they were given by Ford Pro. Therefore, the focus was increasingly directed towards the pick-up trucks that proved to be popular not least because they look almost just like the old trucks, do not disturb existing job routines and provide mobile charging stations for electric equipment such as chainsaws etc.

A second challenge was recognition that a transition to electric vehicles would take a very long time because the turnover time for trucks is slow and the price of electric vehicles is high. They drive their vehicles for many years. This is particularly true for large trucks that tend to last a lifetime. A farmer explains: *“The trucks we have are brand new trucks. We just ordered one that's 240 000 dollars and it will last the rest of my lifetime and probably our kids' lifetime”*.

A third stumbling block was how to secure and store electricity for charging the vehicles. Farmers need easy access to charging. This led to the installation of solar panels that proved to be very successful in providing cheap electricity and reducing emissions. Moreover, they could serve other purposes than charging of cars. Installing solar panels is less of a problem for the large test-farms, however, than for the many small farmers who would not be able to afford them. Yet another problem was how to store electricity. It soon became clear that the farmers needed batteries to avoid buying expensive and unreliable electricity from Pacific Gas & Electricity (PG&E) when the sun was down and the trucks needed charging.

As the vehicle electrification pilot study came to an end, new partnerships were formed to find ways to store and secure easy and cheap access to electricity around the clock. This and other sustainability initiatives were launched under the heading 'Farm of the Future', which sets a broad agenda for collaborative efforts to innovate the way farming is conducted. A SCW leader notes: *"Every time we try something, we get new problems to solve. And then you're like, well, who can we work with to solve the new problem?"*. This is what farming the future is all about. One of the new partnerships is between SCW and the solar energy company, Jordan Energy and conversations with PG&E. One goal is to find a way to reduce the cost of solar panels, and another is to find ways to charge a growing number of electric cars and to improve possibilities for storing energy. Another goal is to identify charging solutions for rural parts of our community, where farming is predominant.

8) The most important governance factors

First, there is a long tradition for collaboration between the local farmers in Sonoma. All the people we have talked to stress that one of the exceptional characteristics of the Sonoma County wine grower community is a strong network and positive relationship between the farmers. An observer with extensive knowledge about US agriculture states: *"They work with each other and share thinking, share opportunities, share equipment, make their ranch available for people to come out and tour and talk about new technologies or new approaches. There is a cooperation there that really doesn't exist [elsewhere]"*. This collaborative spirit is in part explained by the low competition between winegrowers. There seems to be more competition between the wineries that seek to protect and advance their particular brand than between wine growers who sell their grapes to many different wineries.

Another important governance factor driving the co-creation processes is the quasi-public status of the organization i.e., that a government decision has made it mandatory for all grape farmers to be members and pay a fee that funds the organization. Hence, the assessment on all farmers provides the basic funding needed to hire competent staff and to contribute to blended finance schemes with participation of external actors. This quasi-public status is also conducive for securing recognition and support from state level government and financial support from the County government. Add to this that paying a mandatory tax incentivizes the farmers to get involved. As a Commission, SCW is committed to making business better for all farmers in Sonoma County and not only for a small group of members, as sometimes occurs with marketing associations. One of the farmers explains: *"The big thing is that the Commission makes everybody pay. In every other [voluntary] association where it's not mandatory to pay, there's a few who pay, and everyone prospers. There are too many free riders"*. In addition to preventing freeriding, the status as a commission governed by an elected board grants it legitimacy as the authoritative voice of the farmers.

A third and equally important governance factor is leadership. There is a clearly visible and entrepreneurial lead actor who is in close dialogue with an informal core group of influential farmers, a board of elected farmers, and a forum of hand-picked experts. This approach seems to be very effective for simultaneously securing support and input from the local farmers, for forward-looking strategizing and innovation, and for forming productive partnerships. An external actor with deep knowledge about SCW states: *"The leaders have a radar focus beyond the comfort zone. And I think that what these guys do really well is to*

identify threats and opportunities. This does not exist in many other organizations. (...) The leadership thinks in the long term, and I think that's kind of the mindset you need to have in management today".

The fourth important governance factor is a systematic use of experimentation. The strategy in everything SCW does is to try something out at the small scale, see if it works through prototyping and by scaling successful tests and pilots. The extensive use of experimentation goes hand in hand with a willingness to take risks, admit when things do not work, and then move on to finding ways to make them work or give them up and move on to trying something completely different.

Other important governance factors: biosphere conditions, access to blended financing, inclusion and empowerment of affected actors and clarification of interdependence.

9) The generated outputs and outcomes

First and foremost, SCW has turned Sonoma into one of the most sustainable wine growing region in the world. The certification scheme ensures that nearly all grape growers in the region are on a path to becoming more sustainable, and their efforts to do so are monitored through third party auditing. The progress is reported in an annual sustainability report produced by SCW. It documents the gradual progress in number of sustainable farms and acres, and the improvements in sustainability they make over time. The results are impressive in terms of changing the mindsets of the farmers and getting even the very skeptical farmers on board. The certification and progress in making winegrowing sustainable have served as an effective marketing tool, and in addition to improving farmer incomes by getting a better price for their grapes, it serves as a flag post that inspires other farmers to do the same.

In 2023, SCW scaled up its efforts to make the Sonoma wine industry sustainable when it invited the Sonoma wineries to join a new association called the Sonoma County Winery Collaborative (SCWC). While winegrowers grow and sell grapes, vintners make and sell wine and wineries both grow grapes and make and sell wine. In SCW they join forces. The SCW runs the association, and the members pay a membership fee. In 2023, after less than a year, there were over 50 members. The SCW functions as a platform for collaborating on marketing Sonoma wine between all the involved actors and scales up efforts to use sustainable methods by involving the wine producers.

Regarding outputs and outcomes of the sustainable soil management project, which is one of the other subprojects initiated by SCWs, early testing of the climate adaption certificate documented that moving from current practices to lowest emission scenario average would be to remove 1.16 megatons of CO2 equivalent per year. Multiplied by the acres participating in the pilot project following the certification can potentially remove 2,184 metric tons of CO2 equivalent from the atmosphere per year. Again, the results have paved the way for scaling up the initiative. In 2023, a survey among the farmers documented that 45 farmers were interested in becoming test farms. Moreover, it showed that 75% were particularly interested in promoting healthy soil, 45% were interested in regenerative agriculture, and 41% would like to work with water management, while 27% wanted to test electrification and 25% solar energy. Only 13% were keen to work with greenhouse emission reduction. These results signal a marked change in mindset towards sustainability among the farmers although reduction of CO2 emission may seem more abstract than working with directly visible problems.

There were also several positive outputs and outcomes of the car electrification pilot project. Electric charging can reduce many tons of CO2 emissions and proven to cost half of the price of fuel. Moreover, the software installed in the vehicles gave the farmers a lot of valuable information about how to reduce their energy consumption. The establishment of charging stations and the new opportunity to use the electric vehicles as charging stations for other equipment such as chainsaws out in the field (bidirectional charging) triggered a growing demand for a shift from fuel driven to electric work tools.

Finally, the experience with Ford Pro gave the SCW the courage to pursue partnerships with other large organizations and business. A member of the leadership group explains: *"If Ford Pro wants to show up, who else should have a stake in agriculture?"*. The success in establishing similar partnerships nurtured the idea to establish a pseudo-separate platform for co-created innovation after the model of the Aspen Institute. The idea is to *"turn Sonoma County into a living lab where you bring your problems and people come help you solve them"*. The planned title is Sonoma Center for Sustainable Agriculture, and the idea is that it will be independent and have its own funding.

The collaboration with Ford Pro also gave rise to the formulation of the 'farm of the future' narrative that tells a new story about what farming is and could become. One of the leaders of SCW explains: *"Without changing the way farmers see their own future, there would be no future. I say farm of the future is farmers real chance to go on the offense. (...) We want to be proactive. We no longer sell ourselves as a single ecosystem that is the ranch. Instead, we say that we are part of Sonoma County ecosystem, of California's ecosystem, of US's ecosystem"*. The spread of this sustainability narrative is expected to open the doors for new collaborations between local actors as well as beyond the county lines.

10) Lessons learned about the conditions for and drivers of co-created green solutions

The case highlights that a market for sustainable products is a powerful basis for promoting collaboration for green solutions because it creates interdependencies that motivate actors to join and invest in working together. Hence, all the involved parties have a shared interest in market themselves as sustainable and working together can strengthen their respective brands. It also seems as if a collaborative culture and limited competition between the involved actors is important. The limited competition is because the competition is mainly between wineries and not between grape growers.

Scoring and analysis of governance factors

1. Perceived importance of biosphere conditions

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Interviews

Documents

Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

The concern for the biosphere conditions is central to what the SCW generally does and to the electrification project in particular. As shown in a 2023 survey, the farmers in Sonoma view severe biosphere problems as a major challenge: 50% of the farmers view drought as a big problem, and 37 % list climate change as a major concern. Worries about the risk of wildfires come in third (31 %). Only 22% of the farmers are committed to the broader sustainability agenda, however. As noted by a person from the leadership in SCW this might be due to the fact that 99% of the farmers are already certified sustainable. The support for SCWs sustainability strategy seems mainly to be driven by marketing concerns and the fact the certification scheme gives the farmers a better price for their grapes, and the proposed sustainability methods contribute to improve the quality of the grapes and the health of the soil for future generations. Hence, the most important goals for the farmers are vineyard longevity (72%), making quality grapes (59%), and securing a high return on investments (40%). In other words, the support for the sustainability strategy that the leadership has turned into a cornerstone in SCWs marketing strategy rests on the fact that supports these aspirations.

An agriculture expert with extensive knowledge of US agriculture and the SCW explains: *“It takes farmers a long time to accept the climate change agenda. They don’t want to believe the science. But the climate has been so severe in terms of radical change all over the United States and the world. I think most of the farmers, the reasonable farmers, I’m hoping the majority, are beginning to understand that this is a real issue”*. The leadership in SCW have fully committed the organization to the sustainability agenda, while fully recognizing the need to pursue this agenda in a way that also promotes the social and economic sustainability of farming. The strategy is to gradually show the farmers that sustainable farming can not only increase their income and the livelihood of future generations, but also contribute to reducing the future impact of climate change and to restoring nature. The chief means to get some of the more skeptical farmers involved goes through the purse: *“One of the growers who is involved in the [vehicle electrification] pilot projects was extremely skeptical in the first 2 our 3 meetings. He runs one of the larger growing operations in the county, and was very “I buy big trucks, I gotta know how they’re gonna work”*. But he’s also a bottom-line kind of guy. *“If gas is gonna be 5 dollars a gallon, and I can have EV charging on my ranch and put up some solar panels and pay 20% of that in fuel, I’m interested. How do we figure that out?”*. The plus-sum game between saving money and making farming more sustainable seems key to the success of the certification strategy and the sustainability agenda.

Just as more farmers in Sonoma are beginning to see climate change and loss of biodiversity as a threat to farming, so do many of the external partners that SCW collaborate with. Thus, Ford Pro is on a quest to develop products that signal concern for the climate and for the protection of biodiversity.

2. Legislation, programs, and formal goals

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Interviews

Documents

Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

Both regional, state, and national levels of government have programs endorsing and encouraging, and sometimes even enforcing the green transition.

In 2009, Sonoma County established the Regional Climate Protection Authority (RCPA). Its goal is to support actions to adapt to and curb climate change. It has passed a Regional Climate Protection Plan, and a series of climate emergency resolutions. Other regional programs carry some funding for energy efficiency and water management projects. The reputation of Sonoma County is that it is a front runner in supporting the green transition. In 2014 and 2019, it was designated a climate champion by the White House.

Californian state government has an environmental leadership award (GEELA) that is given to actors that have done something extraordinary for the environment. Sonoma County Winegrowers won the prestigious GEELA in 2016 recognizing its sustainability commitment. It has also made different acts promoting environmental initiatives by lower-level agencies and governments. Some years ago, it passed a law that makes it illegal to sell gas cars from 2035, and in 2019 a state law offered regions the opportunity to establish a Climate Resilience District with authority to collect taxes.

The national government has recently passed two acts of immense importance for the green shift. In November 2021 it passed the 'Infrastructure Investment and Job Act', and the 'Inflation Reduction Act' came in August 2022. These acts provide support for projects that aim to advance clean energy, carbon sequestering soil, good-paying jobs in green industries and loans to those who invest in sustainable tools and technologies.

However, these public programs seem to have played a very limited role in motivating and promoting SCWs sustainability initiatives

3. Relative openness of public governance paradigms

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Interviews

Documents

Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

In the US, the relative openness of government to involvement of civil society and business actors seems to vary considerably between policy areas.

In some policy areas, such as energy, public tasks are contracted out to private firms and exposed to performance assessment, which by the way also considers sustainability promotion as demanded in recent federal law. In California, utility PG&E is a case in point. It is a private firm commissioned to make energy accessible to the public.

In environmental policy, government is open to the involvement of private for- and non-profit actors, but it merely defines overall goals, endorses sustainability initiatives and provide opportunities for local and regional partnerships to apply for funding. Government agencies are seldom directly involved in these partnerships.

Although the County government is expected to play a central role in promoting a green transition, it holds limited regulatory powers. It formulates regional environmental policies and distributes some funding. A high-ranking civil servant explains: “We do not have a lot of authority. We’re more of a collaborative governance structure. So, we mostly rely on soft power. But with the power of the purse, we can have actual power”. Hence, the available funding is used to incentivize private actors to collaborate amongst themselves to develop green solutions. To illustrate, the county government use their soft power in the form of policy programs and resolutions and their somewhat harder “power of the purse” to get the 10 municipalities in Sonoma County to collaborate with each other and with private stakeholders in the promotion of green initiatives. The government is not itself a participant in the collaborative efforts.

The attempt to “privatize” environmental policy initiatives is also found at state level and it is not only a product of lack of authority in this field, but also a product of the “change strategy” adopted by state government. A civil servant close to the CA governor with a past in the grape industry explains: “Involving the local stakeholders is how you get behavior change. If you can identify the leaders or those champions that are willing to be the innovator, be part of a demonstration. Growers doing this don't feel like ‘somebody's telling me what to do’. We're learning together. We're showing what we can do. This is how you get that first 25% people on board, and then the others are looking over the fence and learning about it and saying: ‘you mean that it didn't cost more’ or ‘what were the real challenges?’”. Hence, stimulating local collaboration is important because it produces local learning and ownership, and it might be achieved without direct government participation.

The state government also uses some degree of hard power regulation as illustrated by the ban on gas driven cars from 2035, but there seem to be more focus on incentivizing societal actors to solve the problems through local collaboration.

In sum, the predominant governance paradigm seems to be a hybrid between New Public Management and New Public Governance. The idea of mobilizing local partnerships is embraced (NPG), but the model is a privatized one whereby the emergence of local partnerships are merely incentivized through the provision of overall goals and funding rather than proactive collaborative engagement with societal actors.

4. Formalized institutional channels for citizen participation and community mobilization

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

In the US, there are many legal, institutional, and organizational structures supporting citizen participation and community mobilization. The constitution grants citizens the legal right to vote, participate in public debate, and form associations, and the multi-layered layout of the federal political system, the electoral system, and an extensive use of referenda provides access for citizens to influence local political processes. Although the use of these rights and opportunities varies between localities and community, the general picture is that there is a strong tradition for citizen participation and a vibrant civil society. This is particularly true in Northern California where there is a century long tradition for citizen participation and community self-organizing.

There are also some specific institutional arrangements in addition to the ballot box that are in place at the regional and municipal level that allow citizens to take part in governing certain services or to comment on concrete policies. User participation on school boards is a big thing and there are also formal procedures for citizen participation such as hearings that grant citizens a say on matters such as planning and infrastructure projects. In California, citizens also have the right to make propositions for new laws, the fate of which is determined through referendum. Finally, the right to form a marketing commission in agriculture is an important, although very special, channel for citizen participation that allows farmers to organize in a shared effort to promote their particular commodity field.

The county has several ways of engaging citizens in debates on how to address the climate crisis. It has a Climate Action Advisory Committee that brings together voluntary organizations and citizen group. There are also three different area-specific program committees—one on land and water, another on transportation, and yet another on buildings. The committees meet on a regular basis. The region also hosts different events for citizen deliberation. A civil servant from the county says: *“We just had a meeting Thursday night where we had 50 something people attended either in person or virtually to talk about what the priorities are in the community. (...) We are also very interested in building relationships with local community-based organizations that work with our lower income communities and aren’t typically participating in traditional meetings. We want to do more outreach and engagement within parts of the community that we have traditionally been defective in reaching”*. The strategy of the county government is clearly to engage people in local neighborhoods. The emphasis is on low-income citizens rather than landowners or winegrowers, but the strategy testifies to the presence of channels for participation.

However, there is no indication in the data material that the standard channels of participations have been instrumental for the formation of the SCW, but the state legislation that allows farmers the right to form an agricultural association seems to have played a key role on application to California Department of Food & Agriculture (CDFA).

5. Mechanism for ensuring top-down government and bottom-up social accountability

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Interviews

Documents

Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

It is important for the legitimacy of co-creation processes that it is possible for governments, funders, affected citizens and the general public to hold those involved in the co-creation process to account for their actions and results. Accountability does not only hinge on some degree of transparency around the co-created activities and their impact but also on ongoing dialogue with top-down interaction with public authorities and bottom-up interaction with local communities.

Top-down accountability is secured through the oversight conducted by the California Department of Food and Agriculture. This oversight is a condition for being a commission that is allowed to collect assessments. Reporting on how the money is used is a formal procedure that takes place every year. In addition, the Californian Sustainable Winegrowing Alliance regularly holds the farmers using its certification program to account for how they manage the sustainability certification by ensuring third party auditing of the farmers.

SCW is also strong on bottom-up accountability. The leadership is formally accountable to the members of the board, and each member of the board is accountable to the farmers at regular elections. On a more informal basis, the organization as a whole is giving accounts to the farmers and members of the local community in workshops and at social events. An observer close to the organization describes the leadership as follows: *"It is very big on accountability. The slogan is 'If we are going to do something we have to be accountable, just as if you do something, you must be accountable. Without accountability there is no trust"*. Every year the organization produces a report/magazine that summarizes what has been done in the past year. It is circulated online to all farmers and publicly assessable. SCW also host an annual meeting to report out on annual programs and spending.

The limitation is that much of the bottom-up accountability is narrative rather than factual. The SCW is aware of this shortcoming, and it is high on its agenda to develop ways to measures and valorize its accounts. Even more importantly, we have not seen any reports of the feedback from top-down or bottom-up accountability being used to improve the activities and outcomes of the sustainability efforts of the SCW, feedback and input led to the climate certification pilot with California Land Stewardship Institute and inspired the Farm of the Future efforts.

6. Strategic agenda-setting by means of translation

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

The leadership in SCW is well aware of UNs SDGs but UN goals and policies rarely set the agenda in the US and would not work as marketing narrative. A civil servant in the CA state government notes that the SDGs are inspiring because they provide an integrated perspective on environmental, social, and economic

sustainability that resonates well with what the CA state government tries to do, but adds that it is not popular to refer to the SDGs: *“I rarely hear anybody in agriculture in this state or in other departments and sectors, or in society at large, talk about this [the SDGs]”*. The general sentiment among those who know about the SDGs is that although they are relevant at an abstract level, it is more productive to translate them to concrete problems and aspirations that different groups of Americans have. Some wine growers would find that the SDGs are not ambitious enough while others would find them too demanding. And then there are the many who do not think that American farmers should strive to comply with any goals defined by the UN. An observer of the American agriculture community finds that *“the US agriculture do not respect the UN's role in setting the SDGs and it wants to be very independent. (...) You can imagine where that comes from. We're not going to have the world telling us what to do. (...) We do not like global governance.”* Therefore, it makes little sense to refer to the SDGs when mobilizing support for sustainability initiatives.

The strategy of the SCW leadership when trying to motivate farmers to shift to more sustainable agriculture and farming methods is two-fold. On the one side it is to talk about the actual challenges that farmers experience. Hence, they talk about drought and water shortage, the growing number of wildfires, the declining quality of the soil, and the decreasing number of fish in the streams. On the other side, farmers are interested in understanding and identifying opportunities for them to ensure that their land and business is viable for the next generation. This legacy of passing their farms onto their kids and grandkids is an incredibly powerful motivator. Talking about these concrete and clearly visible problems and opportunities serves as starting point for the introduction of the concept of sustainability, the sustainability certification, and for recruiting pilot farms who are willing and ready to experiment. Labelling these sustainability initiatives as marketing has further contributed to building support for initiatives that are well in tune with UNs social, economic, and environmental sustainability goals.

In sum, there is an attempt to set a strategic agenda by referring to sustainability and also an attempt to translate this agenda into something that may motivate farmers, but there is no attempt to translate the UN SDGs to the local level to support co-creation efforts.

7. Construction of narratives about successful multi-actor collaboration

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Interviews

Documents

Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

The narrative in Sonoma County and in the Bay Area in general is that collaboration is the way to success. An observer stresses that collaboration is not just something Sonoma wine growers talk about - it is something they practice: *“In my estimation, they do not just work well together. They (...) share thinking, share opportunities, share equipment, make their branch available for people to come out and tour and talk about new technologies or new approaches. There is a cooperation there that exists in the wine*

business, growing grapes and making wine, but you really don't see it much in other industries within agriculture". A local businessman who is close to many of the farmers in Sonoma County speculates about the origin of this propensity to cherish and practice collaboration: "I don't know if it's because you have the mix of the city and the hippies. Here, there is this (...) sense of 'we've got to find a common ground to work together'. I don't know if that's unique to northern California." Interestingly, there is also a strong competition narrative among the farmers. Competition is seen as a valuable and important driver of healthy businesses and a prosperous society, but rather than seeing competition and collaboration as conflicting they are viewed as things that go hand-in-hand: farmers compete when selling their grapes but collaborate when trying to improve their farming practices. Moreover, both competition and collaboration depend on the mutual respect between people.

This positive attitude to mixing collaboration and competition is also key to the narrative promoted by the SCW leadership. Competition is a driver for doing what is necessary to succeed as a farmer, but working together makes it possible to build a community that is beneficial for each and all of them, as well as for the citizens in Sonoma County. Their marketing strategy aims to help the individual farmers to do well on the grape market, just as it aims to build strong networks between the farmers as well as to farmers and other members of the local community. Collaboration is also the formula for building relationships with external actors that can strengthen the position of Sonoma wine growers in the national and global markets.

8. Building or harnessing institutional platforms and arenas

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Interviews

Documents

Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

SCW participates in different institutional platforms and arenas in Sonoma. One of them is the Sustainability Committee composed of different local organizations that are engaged in a dialogue about how to make Sonoma more sustainable. SCW also participates in regional, national, and global conferences and events where they can market Sonoma wine and build connections and partnerships with relevant actors around common agendas such as sustainability.

Over the years, SCW has established a range of forums where farmers and other local actors can raise issues and debate questions related to wine growing. There are workshops, training seminars and social gatherings. To illustrate, SCW hosted a workshop for the participants in the 17 pilot vineyards testing the climate adaption certificate. One of the test-farmers says: *"The first time [I had to do the certification], I didn't know how to figure out my greenhouse gas emission. How much carbon is in the soil by applying nitrogen, what impact is there"*. Participating in a workshop with the other test farmers brought clarity about how to do it. It also contributed to strengthening the network among the test farms.

There are also important leadership forums such as the SCW board and the executive committee. An observer near to SCW described what is going on in these arenas as follows: *“The board will look at issues, they’ll bring out issues, but the executive committee is more kind of the firehouse mentality: ‘There is an issue that we have got to address and do it right now, right away’. Where the board itself will take a longer view, the executive committee has a more immediate, short-term view of issues”*. In addition to engaging in the day-to-day running of the organization and in agenda setting, the executive committee also supplements the representative functioning of the board: *“The members of the executive board come from the various growing areas. So, you want to make sure that your executive board has representation, whether it’s Eastside, Northside, Southside, so you have that expertise. If there is an issue in a particular area, somebody can speak to it and they can address the issue, answer questions, whatever it is”*. In unison, the two leadership forums provide a solid foundation for securing well-informed and broadly supported decisions.

To advance its capacity for strategy building, the SCW leadership has established a think tank. It consists of experts in agriculture and/or marketing. A member explains: *“They [SCW] use this platform to say ‘here is what we are doing, and we want to know what you think (...). You should know that we are not beholden to the old ways and the old days. We want fresh thinking, and here are some of the issues that are challenging us, and we want to get your insight, your thoughts and some of your direction”*. The SCW leadership finds the think tank highly valuable, and as a next step they plan to turn it into an independent center with its own budget called Sonoma County Center for Agriculture Sustainability (Ag Center). The purpose is to turn Sonoma County into a sustainability lab where local entrepreneurs and beyond can meet to develop and test innovative projects. In other words, it will become a platform for collaboration.

While it is clear from all of the above that SCW and its leadership have access to a variety of forums where collaborative interactions can unfold and become strengthened, there is limited use of physical or digital platforms that supports the co-creation of the electrification of the wine growers’ vehicles and lowers the transaction costs of collaborating, except for the use of standard online meetings and the use of the SCW joint office space.

9. Provision of access to blended financing

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

The economic foundation for SCW is the assessments they collect from the farmers given their status as a commission. With this funding, it can run a professional and highly capable organization. The fact that it is mandatory for the farmers to contribute to funding SCW means that they are also more likely to get engaged and sometimes even provide additional funding because they already have a stake in how the money is being used. An observer of SCW thinks that this co-funding has played a key role in building

support making sustainability a cornerstone in the marketing strategy: *“So they [the leadership] had a real priority to make sure that the group was going in the direction that they supported. And, even if they didn't support it, that's where their money was being spent. (...) The reason why this [sustainability strategy] was able to really take root was because they [each farmer] had skin in the game (...) If it had been a voluntary organization they could have just defected and said 'I don't want to do it this year' or 'I don't understand it'. 'I'm focused over here. I've got my own issues. I don't need to participate’.* Co-funding simply motivated the farmers to invest time and energy in SCW projects rather than disengaging.

The SCW has obtained additional funding from government agencies and private actors. A leader points out that it is difficult to get grants for wine-related projects and explains that SCW has been unsuccessful in obtaining funding from federal government programs such as the National Infrastructure Investment and Job Act, from November 2021, or the Inflation Reduction Act passed in August 2022. Additional funding has mainly come from state government agencies such as California Department of Food & Agriculture (CDFA) in the form of Specialty Crop Block Grants and the (we have not received any funding from the Regional Climate Protection Authority) At times, they are also able to get big businesses to sponsor certain activities. One of the leaders in SCW explains: *“We receive sponsorship dollars from regional and national companies, which supports our overall budget. These dollars are in addition to the grower assessment that is paid every year which is our primary funding”.*

Although additional funding is important for the work SCW does, its continued existence and the efforts to certify the farmers as sustainable do not depend on it. The SCW has its own funding, and the certification is mainly done by the farmers themselves.

However, blended funding is necessary for conducting sustainability-related pilot projects such as the vehicle electrification project. This project is co-funded by SCW, the three test farmers and Ford Pro. SCW has spent a considerable amount of resources initiating and implementing the project; Ford Pro has provided the vehicles, chargers and software, and the staff to support and learn from the local tests, and the farmers have invested their time and energy in trying to adapt their practices to the new tools, and some of them have invested in solar panels to secure cheap and sustainable electricity for the vehicles. At the end of the project the farmers will be able to buy the electric vehicles at a discounted price from Ford Pro. Other supporting public and private actors have also contributed with in-kind resources.

10. The capacity to leverage support from authorities to enable local collaboration

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Interviews

Documents

Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

As noted earlier, it is not easy for actors in the wine industry to leverage support from the federal government. An agricultural expert claims that: *“Not all our industries have been created equal on Capitol Hill”.* Therefore, support from legislators and government hinges on the ability to form alliances with actors

who have a good and close relation with federal decision makers. This is precisely the strategy that SCW is following. They seek to be present everywhere they can and form alliances to as many sides and at as many levels as possible. To illustrate, the SCW organized a trip to the Capitol Hill and brought some of their workers to explain how they are promoting social sustainability in the wine industry. Some of the workers even got to pour wine and talk to Nancy Pelosi. One of the SCW leaders insists that dialogue with government actors is paramount to success: *"I think they [government actors] play a unique role, because they (...) create will, right? Sometimes when you're in private industry and want to form partnerships you need government support to pave and open the doors, you need the public agencies to be saying 'this matters' or 'this is important'"*.

One way of leveraging support from government is to be in close contact with the county government. SCW holds a seat in the Regional Advisory Committee composed of 25 local organizations. In the committee, the participants discuss issues related to transport and climate. Participating in these meetings does not only pave the way for funding but also for giving the regional civil servants the input they need when they talk to legislators about the purpose and content of new plans and programs. That SCW has succeeded in securing support from the county is illustrated by the fact that one of the civil servants describe their relationship with SCW as "almost symbiotic". While this support is important for SCW they do not receive any funding.

This explains why SCW has invested more in its interaction with the state government that has more to offer. However, this interaction has mainly been through informal channels. An advisor for SCW finds that dialogue with the state government is generally very supportive. So, SCW often goes to them: *"We want to make sure they know what we're doing and are aware of it. You know, being in media relations, good news doesn't travel too far. Bad news travels around the globe faster than the speed of light. So, we want to make sure they know our good news and the things that we're doing. And a lot of these, politics is local. So, the locally elected whether you're a congressman or a county supervisor – a lot of the growers know them personally, and we make sure that we have good dialogue"*. In other words, SCW does whatever it can to mobilize support from the local congressman, and it is also in close contact with influential civil servants within the agriculture department in the state administration. Given its status as a commission, SCW is not allowed to engage in lobbying, but they pursue available opportunities to keep key government actors informed about what they are trying to do and how the government can support their endeavor. A leader in SCW puts it this way: *"It is just about making sure that people understand what you are trying to do - if you've got a good story to tell. We want to make sure that it's being told and being understood, and the awareness starts to rise [among legislators and government agencies]"*.

There was no need for leveraging support for the SCW electrification project, but the existing contacts to public authorities cultivated through a number of years would probably have made it possible to receive some support.

11. Inclusion and empowerment of relevant and affected actors

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

The leadership in SCW is working hard to include and empower the farmers and to some extent also the workers at the farms. At the formal level, the elected board represents the farmers, and they are endorsing all decisions made through voting at board meetings. In addition to this formal inclusion, the president and staff use different informal methods to include the individual farmers. They are in dialogue with them at the many workshops and social events, and they conduct surveys among them to collect information about their challenges, opinions, and needs. The farmers are also encouraged to sign up for pilot projects. The philosophy driving these efforts to include the farmers in new initiatives is captured by the general idea that if the leadership does not understand the farmers, and if the farmers do not understand what SCW tries to do, the organization cannot get anything done. A high level of interaction and dialogue is considered a precondition for securing that the leadership and the farmers are on the same page.

This philosophy was emphasized when the SCW leadership decided to become the most sustainable wine growing region in the world. Rather than putting pressure on the individual winegrowers to follow suit, the leadership went out talking to the farmers to hear about their concerns and reasons for not signing up for certification and to find a way forward for each of them. In the wake of such conversations, many farmers found that they were already sustainable in their approach: 'I am already doing that'. The next step in reaching the goal was to assist the farmers in finding ways to become more environmentally sustainable and still make a living. This was the purpose of the many training sessions.

SCW is not only seeking to empower the farmers through different training programs but also the farm workers. In addition to having initiated different social programs – they have established a leadership academy that trains selected workers in running work teams and using new farming practices including those related to making wine growing farming more sustainable. In connection with the leadership training, there is a celebration of the graduates and awards for leaders of the month and leaders of the year.

In the electricity project, there was also emphasis on learning and empowerment, especially in relation to the use of the new software program for optimal management of the fleet of vehicles.

In sum, there is much emphasis on inclusion and empowerment in the activities of the SCW.

12. Clarification of interdependence vis-à-vis common problem and joint vision

QCA score:

- 0
 0.33
 0.66
 1

Scoring confidence:

- Low confidence
 Medium confidence
 High confidence

Data sources:

- Interviews
 Documents
 Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

SCW have managed to create a strong sense of interdependency between the wine growers in Sonoma. An observer finds that the success of the sustainability certification scheme owes to the growing recognition among the farmers *“that a collaboration had to happen, and that if they could all form one group and if Sonoma County brand matters, and is valuable to wineries, consumers, wine lovers, then that means it’s good for all farmers”*. Another observer with extensive knowledge about US agricultural communities stresses the exceptionalism of this way of thinking among farmers: *“Getting farmers to feel interdependent is the hardest because of their independence. You need to visualize the interdependence – that sustainability is about dealing with the economics of their future and then laying the groundwork to say, ‘you know, whether you like it or not, in this area we’re all in it together. We’re either all going to be blamed for climate issues, or we’re going to all show that we’re solving the issue’. [You must convince them that] doing these things with sustainability, it’s just good business practice”*. In other words, it is significant what SCW has achieved in terms of clarifying and building on the interdependency between the farmers.

One of the wine growers talks about a wider-ranging interdependency that goes beyond the grape growers and calls for a broader collaboration: *“If we [the winegrowers] make Sonoma County better we’re all gonna be better and live better [in Sonoma] (...) As it is now, there are many free riders”*. All those actors in Sonoma who benefit from joint efforts should contribute. Another farmer points out that the free riding goes two ways: *“if there wasn’t someone [wineries and vintners] out there marketing Sonoma County wines, we would have struggled to sell Sonoma County grapes. We grow grapes, we need to know consumers want to buy Sonoma County wine. We don’t make wine. But if the wines are selling then we’re selling grapes”*. In recognition of the interdependencies between the wine growers and the winemakers, SCW has invited the latter to join a newly established association closely linked to SCW. They are also seeking to mobilize and join forces all the other actors in Sonoma that benefit from the presence of a strong and thriving wine industry in Sonoma.

There was also a relatively strong sense of interdependency between the participants in the vehicle electrification project. The farmers were interested in testing if electric vehicles would work for them given that they will not be able to buy gas driven vehicles after 2035. Ford Pro wanted to tailor their electric trucks and software to farmers to increase future sales. SCW wanted to strengthen the branding of the Sonoma wine region as sustainable by showing how winegrowers worked with Ford to address the climate crisis. One of the involved employees from Ford Pro describes the interdependency like this: *“We provide them [with the vehicles] (...) and in return, we get the data regarding telematics, mileage, charging use cases and things of that nature. (...) we have a combined interest on this because we are working to try to get (...) the documentation of our results that we can come forward to the public on this”*. This

documentation is not only crucial for selling electric vehicles and software to farmers but also because Ford Motors has signed the Paris Agreement and publicly declared that they will be carbon neutral in 2050.

In sum, there seems to be a relatively strong interdependency in relation to common problems and goals at all levels and all the way round.

K: on County: Suzanne and Tanja, then they can communicate, we don't need to actually regulate because the farmers are voluntarily doing this. And they understand the implications of that, right? And then in their role of climate authority, like they actually get to be not only the communicator on how we're volunteering to do this, but we get to demonstrate a ladder up to helping them reach Sonoma County goals on climate action by what we're doing here. I think it's a really integral sort of collaboration and partnership, even specifically in are they going to help them add charging stations? But as a communicator, they say we need to add charging stations in 30 locations. And then I'm like, well, 10 of them need to be in rural Sonoma County or our farmers are never going to be able to charge their trucks. That's the conversation, we need them at the table. We need to be at their table and they need to be at our table for that conversation. I think that's where the benefit is.

Key point is that SCW become “ambassadors” of Ford Pro. Video

13. Trust-building and conflict mediation

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Interviews

Documents

Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

The SCW is doing a lot to build trustful relationships with the individual farmers as well as with external partners and the way they seek to do that is according to several informants by always being honest and delivering results. The level of trust is already strong in the farming community because the farmers in the county know each other well. A farmer explains: *“What makes Sonoma County really unique is that our farmers know each other, their families sort of grew up together. There's a lot of trust and respect probably amongst the population”*. The trust and respect is said to enable the farmers to make bold and hard decisions together.

Building trustful relationships with people outside the wine grower community is also perceived as important and the SCW leadership invests a lot of energy in doing that. One way is to always show up to events and discussions, be in the room, and form relationships. The leader of SCW spends a lot of time contacting potential partners and is always open to invitations to participate in different kinds of events and activities: *“When they make contact, I say yes. (...) I go and sell the message. Inevitably, there is the leader of this organization and someone else that runs this or that government, and a mayor or a city council member. Over time you build trust through those conversations (...) Trust takes time. It is all about networking”*. The trust that comes out of networking opens the door for future collaborations.

Another strategy for building trust, is to talk openly about problems, failure, and differences of interest. SCW's philosophy when they seek to persuade farmers to get certification or to recruit them for a pilot project is not to stipulate that it will be easy or to exaggerate the potential benefits. Ford Pro follows the same philosophy: *"You have to start with a degree of honesty. Saying that this is a pilot – that this is not us electrifying your total operation - and admitting we are here to learn. First and foremost. (...) Being brutally honest that things are going to go wrong and admitting that up front brings some humility to the whole practice. For sure, things went wrong. I have a massive list of things that went wrong. You build trust, humility, and focus on what is important"*. This early honesty makes expectations more realistic and when trouble eventually arises people do not feel cheated.

The third thing that the SCW leadership refers to as essential for building trust is the ability to deliver on promises made. If you set out to turn Sonoma into the most sustainable wine producing County in the world, you'd better make it happen. Otherwise, people are unlikely to take you seriously next time. The strong support for the SCW leadership does indeed seem to be closely related to its ability to deliver noteworthy results.

The collected data says very little about conflict mediation in and around SCW, although the meeting that we observed showed several attempts deal with minor objections in an accommodating way. Moreover, what informants communicated to us is that the strong sense of interdependency between the actors in and around the SCW helps to resolve conflicts in a productive manner. To illustrate, the potential conflict with the winemakers over freeriding in relation to the SCW efforts to brand Sonoma wine was preempted by including them in the marketing endeavors. Another potential conflict in the vehicle electrification project was between the farmers and Ford Pro. Ford Pro insisted that the farmers needed a permit to install the chargers, but the farmers were reluctant to go through this ordeal. However, the fact that everybody had at that time really bought into the project meant that the farmers accepted to get permits.

14. Use of experimental tools for innovation

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Interviews

Documents

Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

Experimentation is widely used in SCW's efforts to make grape growing more sustainable. A case in point is the different pilot projects. Their purpose is to develop and test different ideas, processes, and products in real life farming. The test farms serve as laboratories for testing prototypes, and the next step is to diffuse and scale up what works. As one farmer deep into experimentation observed: *"We have been doing an experiment where 50% of the one block [of land] is no till and 50% is till (...) we are also experimenting on production, water use, and organic matter retention in the soil. We had compost on both [blocks], and we are seeing which holds it [the water] more"*.

The SCW Sustainability Report from 2021 mentions similar experiments: *“Sunny view Vineyard, where the SCW office is located, devoted 12.4 acres to experiment with different vineyard practices that reduce CO2 and N2O emissions. Control block continues with existing farming practices of all till and no planted cover crop. The experimental block farming practices are altered to every other row tillage and are planted with a high organic matter cover crop. To further carbon sequestration, 6 hedgerows amounting to 3,500 ft. were planted around the vineyard this past December”*. Experimentation is perceived as crucial for learning and innovation and for reducing the risk of trying something new at a big scale. If the innovations do not work when tested in small scale, the loss is marginal.

Experimentation is the quintessence of the electrification pilot project. It is all about testing how the electric vehicles, the charging systems, and the software function in everyday work life at the farms and using the insights to open up new futures. One of the leaders of SCW points to the importance of involving both producers and end users in the experimentation given that they have so much to learn from each other. Involving the farmers also makes it is easier to convince other farmers that the innovations are both environmentally and financially sustainable: *“If you have pilot farmers that are willing to work with the organization [Ford Pro] and then take the results and share it, you actually are able to say: ‘well, if you invest in this, the return is two years or you see it in six months or here's what it means financially to not pay for that gas or here's what it means in a carbon footprint’”*. Involving the test farmers directly in spreading this message is a powerful tool.

SCW is currently scaling up its innovation with the introduction of the concept of ‘the farm of the future’ that asks: What do we want agriculture to look like in the future? Finding the answer to this question takes more than experimentation in pilot projects and discussions in the thinktank and at summits. This is why they are in the process of establishing Sonoma Centre for Sustainable Agriculture (SCSA) where relevant and affected actors in Sonoma and beyond can experiment and innovate.

15. Ongoing critical self-reflection and learning (i.e., process and/or developmental evaluation):

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Interviews

Documents

Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

There is a considerable willingness among the participants in and around SCW in general, and in the vehicle electrification project in particular, to critically reflect on project designs and ideas. Hence, the strong focus on summative evaluation and accountability mentioned earlier in this report is supplemented with ongoing developmental evaluation where ongoing critical reflection gave rise to key lessons. Here are some illustrations.

For Ford Pro the experience with the electrification project made it clear that it is not possible to develop a product that works for the intended purposes without collaborating with the end users. This is how you

detect what their needs are. As noted by one of their staff, Ford Pro discovered that ongoing discussion was a way to “learn about how this (their electric cars and software) is all going to go down [among farmers] (...). This [end user involvement in experimentation] is what we have to embrace to evolve and make changes and deliver products and services that our customers value (...) - the smallest trouble they have from the delivery to the product to setting it up to not knowing where or how to plug it in or whatever - is a chance for us to pick that up and pass it along to our parties in Ford Pro, but also across Ford and say, as we think about this adoption, this paradigm shift that is going to happen in this industry, here is something we need to consider. Yes, it might just be a small wine grower in California, but it is a customer nonetheless and sometimes those are the best learnings. I think that has really helped here. Hopefully, if you ask the wine grower teams and the association itself, they would echo a similar sentiment to how we have approached it”.

SCW reports that they have indeed also learned a lot, and that the pilot project gave them cause to reflect on their practices and learn about how to conduct future experiments. Among other things, the leadership gradually realized that the design of the pilot project suffered from a misalignment between what Ford Pro expected to get out of the test of the software and what a study of wine growers could provide. A SCW leader explains: “There is more benefit in telematics when you drive a lot of miles - like Amazon delivery. They [Ford Pro] hoped there was a lot of benefits from telematics. But farmers don’t drive as much, so telematic benefits wouldn’t appear for 3 years. We would have needed a longer experience to really show results for Ford Pro. (...) So it was a great learning experience”. This learning can be used to improve future project designs.

In sum, the core participants in the electrification project thought that they benefitted from critical reflection and learning. However, the lessons learned seem to be more directed towards the future than towards how to improve the co-creation. There is not much reflection on whether they could benefit from working together in new ways, and possibilities for continuing the collaboration beyond the testing project.

16. Exercise of facilitative leadership:

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Interviews
- Documents
- Observations

Please elaborate on the reasoning behind your scoring for this governance factor:

The leadership in SCW is directive, facilitative, and responsive. It directs the farmers in a highly facilitative fashion, while also paying keen attention to their needs and opinions.

First there is the leadership exercised in relation to the SCW board. According to a member of the leadership team, the advancement of the sustainability agenda made it necessary to gradually change the mindset of the board members to make them an active force in endorsing and promoting the agenda: “In the beginning, I would say, our board was like, we're going to do this [becoming sustainable], and then

about two years in, they're like, no, we really are believing in it. And then four years in, they were the ones being the ambassadors. And by the time we hit 99%, they sort of said, well, what's next?" Another task was to get the board to take leadership of the efforts to make Sonoma grape growers continuously more sustainable. The message to the board was: *"If we're going to do this, you as our board members – and you get to be a board member because you're voted on by your peers to sit through an election process – you are already an influencer in the farming community and in Sonoma County community broadly. And if we're going to do this, then you're going to lead by example, you're going to be the first to show up and do this, not the last, right? And then you're going to ask or invite your neighbor to do this (...) and host lunches for your neighbors".* However, the leaders of SCW are not only directive but also responsive to the board members. A civil public sector CEO observes that the SCW president is both dynamic and responsive: *"You can have a very dynamic leader, but a dynamic leader that is disconnected from or not listening to and helping the board is not a good leader]. It's a give-take relationship".* This directive, facilitative and responsive leadership of SCW was clearly visible when we observed a board meeting.

This leadership approach is also guiding SCWs dialogue with the farmers. One from the leadership team remembers: *"I talked to a couple of growers [who said]: 'what did you sign us up for?' I'm like: 'do you not want to be sustainable?' (...) And I say: 'then let us help you do that path'. (...) Let's go through the exercise of understanding if it is possible'. And I think that's really the genesis of our movement. (...) It would take different strategies for people because some of them are just [saying]: 'sustainability, what is this?' while others [are ready to move forward]. There's also a question about money. So, you need to have a strategy or some way of saying, how can we either convince them that it's not expensive or show them how they can actually do it more gradually?'*

Another mantra in SCW is that leadership is *"connecting dots"* between members of a constituency and turning the organization into an attractive dot that others will partner with. Several informants find that the president is extremely good at becoming such a dot. One of them states: *"besides making us sustainable she [the president] made Sonoma County (...) a global player in the wine industry. We're taken much more seriously now than we ever were. Just the fact that she's invited to be a part of FIVS - (Global organization) and go to all their conferences. And she's there. She's not there with Bordeaux. She's there with France. She's there with New Zealand. Wines of Australia. Wines of Chile. All these countries (and continents), and then Sonoma".*

In sum, facilitative leadership is both exercised internally and externally and helps to connect actors in processes of collaborative problem solving.

Outcome variable: Successfully co-created green transitions

The outcome variable 'co-created green transitions' will be scored in two parts. First, 'co-creation' will be scored based on an assessment of whether the participants in the initiative, project or process engaged in collaborative problem-solving that fostered creative ideas and innovative solutions (data will consist of survey data combined with interviews and documents). Next, 'green transitions' will be scored based on an assessment of whether the initiative, project or process has fulfilled or is expected to fulfil its green goals, ambitions and aspirations (data will consist of survey data combined with interviews and internal and/or external evaluation reports, including scientific publications).

The scoring of this variable is done in two parts:

1. Is the developed solution based on collaborative problem-solving spurring creativity and innovative solutions?
2. Does the developed solution engender a green transition?

This scoring should be conducted based on both the survey and complementary green outcome evaluations. Please consult Sections 4.4 and 6.10 in the Research Protocol for more details.

1. Is the developed solution co-created?

QCA score:

- 0
- 0.33
- 0.66
- 1

Scoring confidence:

- Low confidence
- Medium confidence
- High confidence

Data sources:

- Survey
- Interviews
- Documents
- Observations

Please elaborate on the reasoning behind your scoring for this part of the governance factor, including the data sources used for the scoring.

Both the original SCW sustainability certification project and the new vehicle electrification pilot project were co-created by relevant and affected actors. The certification project was co-created between the formal leaders of SCW and a network of influential farmers and some other relevant organizations and auditors. They originally used the certification method developed by The California Association of Wine Grape Growers and The Wine Institute, and they are in the process of further developing the method in collaboration with those organizations. The vehicle electrification project was co-created between Ford Pro and SCW with the local county as supporting actors, and the implementation was co-created between Ford Pro and the test farmers. Challenges emerging during the co-creation processes has sparked efforts to initiate new co-creation processes with partners such as PG&E and Jordan Energy around the use of solar panels and enhancing local capacity to store energy.

These conclusions regarding the role that co-creation have played in the case is supported by the answers to questions 1-15 in the mini survey (see below). Survey response rate was 88% (13 of 15 respindents). Close to 85% of the respondents slightly agree or strongly agree that collaboration was essential for SCW to make progress because the collaboration promoted the exchange of different perspectives, ideas and knowledge needed to develop unconventional solutions that go beyond standard solution. Also, though somewhat smaller, a clear majority finds that the developed solutions break with conventional wisdom. Almost 77% of the respondents state that the project has produced innovative solutions. The respondents are for the most part content with the overall collaborative process and support the solutions.

If possible, please insert your survey responses in the table below (in % for each response), including the mean/average % for each survey item.

	STRONGLY DISAGREE	SLIGHTLY DISAGREE	NEITHER AGREE NOR DISAGREE	SLIGHTLY AGREE	STRONGLY AGREE	DON'T KNOW	TOTAL
The collaboration combined different experiences, and/or ideas and/or forms of knowledge to develop new perspectives	7.69% 1	0.00% 0	0.00% 0	7.69% 1	84.62% 11	0.00% 0	13
Through the collaborative process, different experiences and/or ideas and/or forms of knowledge have been mobilized to search for unconventional solutions	7.69% 1	0.00% 0	0.00% 0	30.77% 4	61.54% 8	0.00% 0	13
The collaborative process mobilized different experiences, and/or ideas and/or forms of knowledge to search for solutions that go beyond known standard solutions	7.69% 1	0.00% 0	0.00% 0	15.38% 2	76.92% 10	0.00% 0	13
The collaboratively developed solution breaks with established practices	15.38% 2	0.00% 0	15.38% 2	38.46% 5	30.77% 4	0.00% 0	13
The collaboratively developed solution disrupts conventional wisdom	15.38% 2	7.69% 1	7.69% 1	46.15% 6	23.08% 3	0.00% 0	13
The collaboratively developed solution offers new ideas to address the green transition problem	7.69% 1	0.00% 0	0.00% 0	38.46% 5	53.85% 7	0.00% 0	13
I'm supportive of the collaboratively developed solution	7.69% 1	0.00% 0	0.00% 0	7.69% 1	84.62% 11	0.00% 0	13
I'm content with the overall collaborative process of the project	7.69% 1	0.00% 0	0.00% 0	38.46% 5	53.85% 7	0.00% 0	13
I feel the collaborative process was a prerequisite for the success of the project	0.00% 0	7.69% 1	7.69% 1	7.69% 1	76.92% 10	0.00% 0	13
I'm satisfied by the results of the collaborative effort in terms of expected impact on the welfare of the community	7.69% 1	0.00% 0	0.00% 0	38.46% 5	46.15% 6	7.69% 1	13
The collaborative interaction in the project has led to an innovative solution	7.69% 1	0.00% 0	15.38% 2	23.08% 3	53.85% 7	0.00% 0	13
The collaborative interaction between the actors in the project stimulated creative problem-solving	7.69% 1	0.00% 0	7.69% 1	15.38% 2	69.23% 9	0.00% 0	13
The collaboratively developed solution meets the proposed goals of the project	7.69% 1	0.00% 0	7.69% 1	30.77% 4	53.85% 7	0.00% 0	13
The collaboratively developed solution will be durable and robust in the long run	7.69% 1	0.00% 0	15.38% 2	7.69% 1	53.85% 7	15.38% 2	13
The collaboratively developed solution is expected to significantly improve sustainability for the whole community	7.69% 1	0.00% 0	0.00% 0	15.38% 2	76.92% 10	0.00% 0	13

2. Does the developed solution engender a green transition?

QCA score:

0

0.33

0.66

1

Scoring confidence:

Low confidence

Medium confidence

High confidence

Data sources:

Survey

Interviews

Documents

Observations

Please elaborate on the reasoning behind your scoring for this part of the governance factor, including the data sources used for the scoring:

Keeping in mind that the data we have on this is mainly but not entirely self-reported, the data suggests that there are several ways in which the co-created solutions have fostered a green transition.

At a general level, SCW has turned 99% of the Sonoma winegrowers into sustainable farmers. The certification relies on third party auditing based on self-reported 140 measures. The certification guarantees that the farmers can document that their farming methods are becoming increasingly sustainable every year. They get a stamp on their grapes and sell them at a higher prize.

The test farmers in the vehicle electrification pilot project agree that the software has reduced the idling of the vehicles and thus reduced the consumption of unnecessary electricity/gas. One of the test farmers explain: *“Our fuel bill is huge every year. If I can have even a couple percent impact, those are real dollars back to the company. And for me it's also very important from the greenhouse gas emissions”*. Analyses carried out by SCW and Ford Pro shows that the three test farms reduced their energy consumption significantly in addition to harvesting other benefits.

>1M ICE Miles Driven and Counting

			
Total Miles Driven (ICE):	105,000*	825,000*	80,000*
Total Fuel Gl. Consumed (ICE):	9,600*	59,000*	6,100*
Total Connected Vehicles:	31	63	13
Total Gas Gl. Savings (EV):	800*	580*	640*
Total kg of CO ₂ Saved (EV):	6,000 kg*	4,000 kg*	5,000 kg*

Sonoma County Winegrowers Survey Findings (April 2023):

58%

Reduced time spent tracking fuel usage by an estimated 58% with a solution like Ford Pro Telematics

49%

Reduce idling hours by an estimated 49% with a solution like Ford Pro Telematics

20%

Reduce service downtime by an estimated 20% by using Mobile Service

37%

Reduce time spent tracking maintenance schedules by an estimated 37% with a solution like Ford Pro Telematics

“We have over 50 vehicles on Ford Pro Telematics and have already identified insights that are improving our bottom line like long idle times costing us an estimated \$24,000 per year in wasted gas.”- Marissa Ledbetter, Partner VINO Farms

The vehicle electrification project has also stimulated a switch to solar energy and thus an embrace renewable energy that is a precondition for electrification to be sustainable. The project has also led to the introduction of other electric equipment in the wine farming. There are not data about the impact of these developments on energy consumption.

In one test farm, the electrification project has gone hand in hand with the introduction of other forms of sustainable farming: *“We actually buy our compost from the waste stream from the urban areas. Everybody has these green bins in front of their house, they put their leaves in or whatever. That comes back to us and is put out on [the vines and then used to sequester carbon”*. Moreover, they have introduced a drip system that saves them a lot of water and found ways to avoid releasing nitrous oxide: *“If you irrigate and have nitrogen in the field at the wrong time, you release nitrous oxide, which does more harm to the ozone”*, so they have stopped doing that.

Survey questions 16 – 19 (see below) show that close to all the key stakeholders find that the solutions developed in SCW have already promoted a green transition of wine growing and is expected to further

enhance the sustainability of Sonoma wine growing. Note that the answers concern the activities in SCW in general and not the vehicle electrification project explicitly.

There are not at present any hard facts about how much is being done to reduce CO2 and N2O emission and enhance biodiversity but the transition to electric cars, the instalment of solar panels, and the software reduces the level of CO2 emission at the test farms.

If possible, please insert your survey responses in the table below (in % for each response).

The project:	Yes	No	Don't know
...did not produce any green transition solution	1.69%	92.31%	-
...is expected to produce/has produced a green transition solution aiming to avoid a worsening in the status quo	58.33%	41.67%	-
...is expected to produce/has produced a green transition solution aiming to maintain the status quo	15.38%	84.62%	-
...is expected to produce/has produced a green transition solution aiming to improve the status quo	92.31%	7.69%	-

Please list all the informants you have interviewed for the case study (list project role + interview date):

All 15 interviews were conducted between the 1st of December 2022 and 1st of March 2023.

Position	Organization	Type of actor
President & CEO	Sonoma County Winegrowers	Public actor
Vice President	Sonoma County Winegrowers	Public actor
Farmer	Winegrower	Private actor
Farmer	Pilot farmer, Dutton Ranch	Private actor
Farmer	Pilot farmer, Bevill Vineyard Management	Private actor
Secretary of Agriculture	California Department of Food & Agriculture	Public actor
Senior Vice President	Western Region at Fahlgren Mortine	Private actor
Executive Director	Sonoma County Transportation and Climate Authority	Public actor
Interviewee	Sonoma County Transportation and Climate Authority	
Professor	Wharton University	Public actor
Communications Manager	Ford Pro	Private actor
Global Chief Marketing & Experience Officer	Ford Pro	Private actor

Global CEO	Ford Pro	Private actor
Global Director	Ford Motor Company	Private actor
Former CEO of Dairy Management	Policy expert in agriculture, and advisor to SCW	Private actor

Please list all the observations you have made (type of meeting/workshop/etc. + observation date):

Meeting in steering Board meeting, 5th of December 2022, in the SCW headquarter.

Meeting in SCW Thinktank, 18th of July 2023 in SCW headquarter.

Sonoma Wine Grower “Farm of the Future” Summit, 19th of July in Healdsburg.

Please list all the documents you have used:

SCW Sustainability Reports 2015-2021

Sustainable Winegrowing Program, California Wine Growing Alliance, https://www.sustainablewinegrowing.org/sustainable_winegrowing_program.php

‘Sonoma County Regional Climate Protection Authority – An Overview’, slides presented by Suzanne Smith, Executive Director, December 20, 2022

‘Farming the Future’, slides presented by SCW President Karissa Kruse, 19th of July 2023 at SCW Summit in Healdsburg.

‘Understanding the Opportunity’, slides presented by John Segale from Western Region at Fahlgren Mortine and member of the SCW Think Tank, at the SCW summit in Healdsburg.

‘Farming the Future’, SCW webpage describing the vehicle electrification project: [Ford Pro Electrifies Farming with Sonoma County Winegrowers](#)

‘Certified Californian winegrowing: From Grape to Glass’, An overview of the purpose and requirements., The California Winegrowing Alliance.

‘Performance Metrics’, The California Winegrowing Alliance: <https://www.sustainablewinegrowing.org/performance-metrics.php>

A survey of the fears and needs of Sonoma Wine Growers, slides presented by SCW president Karissa Kruse at SCW Summit in Healdsburg, 19th of July 2023.

‘Building a Clean Energy Economy: A guidebook to the Inflation Reduction Act’s Investment in Clean Energy and Climate action, Cleanenergy.gov, January 2023.

Overview of programs and grant opportunities, Office of environmental Farming and Innovation, California Department of Food and Agriculture, <https://www.cdffa.ca.gov/oefi/>.

‘Climate Action and Beyond’, Regional Climate protection Authority (RCPA), <https://rcpa.ca.gov/what-we-do/climate-action-2020/>