

Introduction

A global effort is underway to reduce carbon emissions and mitigate the worst of climate change effects, including ecosystem destruction and massive loss of human life. Global carbon dioxide emissions continue to grow, however, with a 2% increase documented in 2018 (Olivier et al., 2020). The most recent decade was the United States' warmest on record, and temperatures are expected to continue to rise (National Climate Assessment, 2014). Renewable energy technologies have taken the center stage, with many countries, nations, and states setting progressive goals to decarbonize their energy sectors in an effort to help.

California began its journey to state-wide decarbonization upon passing the California Global Warming Solutions Act of 2006. This set the goal of reducing carbon emissions to 1990 levels by 2020, "a reduction of approximately 15 percent below emissions expected under a 'business as usual' scenario" (California Air Resources Board, 2020). Since then, the state has expanded this goal to include having 60% renewable energy in its portfolio by 2030 (California Public Utilities Commission, 2020). There follows a need not only in California but around the world for a relatively inexpensive way to produce large amounts of low-carbon electricity to shift away from fossil fuels.

As with any energy infrastructure, production of such systems requires tradeoffs in land-use, efficiency, and stakeholder concerns. Land-based wind power systems can offer a viable solution, at least technologically, to the issue of magnitude, reliability, and proximity of power production to demand hubs, though such developments have spurred large amounts of opposition from a variety of stakeholder groups (Lost Coast Outpost, 2019). Be it environmental, cultural, aesthetic, safety, or economic concerns, these groups have disputed aspects of land-based wind power system technology that lead to not only delays but millions of dollars lost in pursued but

ultimately abandoned projects (KCET, 2012). For example, the private company TerraGen spent millions assessing a large wind farm development in Humboldt County, California, that ultimately was denied by the City Council because a key piece of development land was a sacred prayer ground for a local indigenous population. Seeking to avoid this barrier to implementing low-carbon energy technologies, local and state entities have started to look for ways to produce the massive amounts of power needed to meet carbon reduction goals that do not spur such a magnitude of social resistance.

The support for Offshore Wind Turbines (OWT) comes from such impetus, seeing that the turbines may be placed out of sight while also accessing consistent and powerful wind resources relatively near to load centers (Margaronis, 2020). Developing this technology at a commercial scale is necessary to produce competitively priced power, and such projects are underway along the East Coast. In California, however, the dramatic deepening of ocean waters beyond the thin Continental Shelf has delayed progress. National Renewable Energy Laboratory analysis reveals that 96% of the wind resources lie in these waters prohibitively deep for traditional OWT technologies (Butterfield et al., 2007). The need for floating systems thus becomes clear, as social opposition is too high on land and wind power is a needed component of California's renewable energy portfolio based on its characteristic time and amount of energy production.

Seeing that a wide variety of stakeholder values will ultimately oppose or allow such designs to be developed, these considerations must also be anticipated in order to lower overall costs. This paper investigates how California's process for transitioning to a cleaner grid, particularly with regard to wind energy development, could more meaningfully engage the

community, help stakeholders imagine potential energy futures, and effectively integrate their concerns into the development pathway.

Wind Energy Infrastructure Development in Humboldt County, California

Humboldt County is a region in northern California that is being heavily considered for both onshore and offshore wind development based on its access to high wind speeds. The Redwood Coast Energy Authority is a “Joint Powers Authority”, or a representative body of local governments, that directs and regulates this local energy development (Redwood Coast Energy Authority, 2020). Its service territory is pictured in Figure 1.



Figure 1. Map Representation of RCEA Service Area (Image Source: Redwood Coast Energy Authority, 2020).

Clean energy infrastructure development in Humboldt exists within the context of both local and state-wide goals to curb carbon emissions. These goals define parameters such as percentage of renewable energy within the electricity generation portfolio, carbon emissions reductions, and electric transmission infrastructure upgrades that work to influence the particular technologies utilized in making this transition (Redwood Coast Energy Authority, 2020).

Furthermore, local demand for electricity must be considered in this process, as generation technologies such as wind and solar can provide electricity at different times and may not be in concert with when the populations need it. Without comprehensive analysis of these factors, the electric system could fail to provide adequate services for the community's demand, resulting in

demand response efforts such as rolling blackouts and load shedding (Redwood Coast Energy Authority, 2021).

A number of interacting technical, regulatory, and socially normative elements specific to Humboldt affect the development of wind energy technologies in particular. To achieve the ultimate goal of decarbonizing the local grid as part of the state's larger climate action plans, entities involved in the process must balance the technical parameters of what constitutes a viable offshore wind location, the interest of commercial offshore wind developers, the regional/national goals, the local attitudes/goals for the use and experience of the landscape as well as the economic effects that installing these turbines will have in the area. Each of these components contributes to the definition of "constraints" in the system, ultimately directing the path to physically implementing such green infrastructure. Throughout the definition of these constraints are opportunities for the public to participate in the process of imagining potential energy infrastructure futures, engaging with developing new ideas and suggestions for turbine technology and placement, and for the directing agencies to incorporate such opinions into the carbon action planning.

The Bureau of Ocean Energy Management, California Public Utilities Commission, California Energy Commission, Pacific Gas and Electric Company, and The Redwood Coast Energy Authority are all large players in assessing the viability of floating offshore wind areas and their place within the electricity portfolio based on technical parameters. Technical parameters influencing wind turbine development include wind generation potential, local demand profile, and transmission capability to ensure that offshore wind energy can be utilized (Ortega et al, 2020). Analysis performed on these characteristics has demonstrated that "offshore

wind farms deployed in the Humboldt Call Area achieve annual capacity factors between 45% and 54% after losses and maintenance” (Ortega et al., 2020, p.1). The capacity factor, a metric relating percent of incoming wind energy converted to outgoing electric energy, is a measure of success of the wind turbine system. A capacity factor of between 45% and 54% communicates that Humboldt is a very attractive location for wind development, especially seeing that average on-land turbine systems for projects built between 2014 and 2017 was 41.9% (University of Michigan Center for Sustainable Systems, 2017). With regards to the local energy portfolio, wind energy is a welcome complement to the existing and proposed solar power capacity within the region. The RCEA reports that the peak of electricity use in the region is towards the evening when solar energy has started to decline, causing major issues for the state’s grid operators (Redwood Coast Energy Authority, 2021). Wind tends to provide most of its power later in the day and can support this dip in solar production. Transmission development, however, is a major concern in the expansion of wind infrastructure in this area. As reported, “Larger offshore wind development in the order of 1–2 GW would require major transmission upgrades in order to avoid severe curtailment” (Ortega et al., 2020, p.2). Transmission upgrades signify even greater need for community participation, as such infrastructural adjustments can cause changes to the landscape as well as spur opposition due to the perception that more wealthy, urban areas of California will profit off of resources in the rural regions (Redwood Coast Energy Authority, 2020).

Anticipatory Governance for California Energy Transitions

Floating Offshore Wind (FOW) systems and their technological developments in the United States (U.S.) exist as part of a greater effort to transition electric grids across the world to

lower carbon sources. Energy transitions are about more than just greenhouse gas reductions, however. They entail processes largely disruptive to current norms and traditions of providing and accessing energy in the U.S. today, a system in which one's source of energy is largely out of sight and out of mind (Stirling, 2014). Furthermore, the significance and uses of energy, regardless of source, are highly specialized based on geographic area and cultural norms (Walker et al., 2007). Niche aspects of the energy itself, be it frequency reliability, price, or power capabilities, may be of utmost importance to one stakeholder group and yet entirely insignificant to another. And yet, action is necessary across this broad range of experiences to reduce U.S. carbon emissions in conjunction with a world-wide effort to mitigate climate change. The result of failure may be catastrophic loss of human life and the destruction of many of Earth's ecosystems.

Responding to a lack in federal action, US state and local governments have declared goals for carbon emission reductions in a seemingly grassroots-based effort to mitigate climate change. Such ambitions largely gloss over nuanced barriers to achieving the desired shifts, however. Technological solutions to cutting carbon and other greenhouse gas emissions are touted as silver bullet solutions, while in reality the much more ambiguous challenge of incorporating such technologies into local cultural systems lacks attention both in the press and in research funding. In fact, a meta-analysis of climate change research indicated that between 1990 and 2018 770% more funding was allocated to the natural and technical sciences than the social sciences (Overland et. al, 2020). The power of attitudes, norms, incentives, and politics in a given area to influence technological development seemingly surprises renewable energy developers again and again as they fail to consider these factors in assessing the viability of projects and ultimately waste time and money pursuing projects bound to garner social

opposition. Such dynamics appear to have influenced the general migration of large generation technologies away from public eye, and in California has contributed to efforts to move wind energy production offshore despite the cost of developing and testing newer FOWT technologies (Gottschamer, 2020).

This issue has begun to be recognized and efforts to include stakeholders' opinions increased in California renewables development. In 2016 a task force was created to bring together federal, state, and local agencies to determine the best locations for offshore wind energy development in California, including local tribal governments in the mix (California Energy Commission, 2020). Despite this, local NGOs have raised concerns about the application of an international wind developer, Ideol, to lease 40 square miles of space off of the central coast for floating turbine farms in August of 2019 without their ongoing consultation as to the socio-cultural impacts such a project would have (Savage, 2019). A coalition formed between Audubon, Natural Resources Defense Council, The Nature Conservancy, Center for Biological Diversity, the California Coastal Protection Network, and Surfrider to ask for a continuance of the lease application until the California State Lands Commission's (SLC) next meeting in October. This resulted in further delays to the offshore wind development process. SLC staff and Ideol representatives ultimately contacted this coalition to ensure all stakeholders had adequate opportunity to weigh in, though such reactive methods of stakeholder inclusion failed to preemptively recognize the need for a plurality of viewpoints and social group buy-in to successfully develop energy infrastructure (Savage, 2019).

Addressing climate change is a challenge with a timeline seeing that extensive carbon reductions must be made within the next decade to meet the Paris Climate Accords' goals of

limiting warming to 1.5 degrees Celsius. Therefore, it is of interest how values across geographic localities in California may be preemptively assessed and populations engaged in the process of energy infrastructure planning before major decisions have been made to prevent delays as these values ultimately surface through public opposition. The framework of Anticipatory Governance applies nicely to this dilemma, defined as “a method of decision making that uses predictive measures to anticipate possible outcomes to then make decisions based on the data provided” (Quay, 2010, p.496). Anticipatory Governance supports engagement, foresight, and integration as concepts to bring stakeholder inclusion earlier into the process of low-carbon energy technology implementation and prevent costly reevaluations both in time and money down the line (Davies, 2012). Engagement entails active public deliberation and discussion around project planning in ways that are meaningful rather than performative, such as before key decisions have been made. Foresight involves “futuring” (imagination of the future) and scenario-building to generate ideas of possible outcomes, and elucidates the values that stakeholders hold with regards to the system. The concept of integration aims to bring these together and respect the plurality of ways in which stakeholders know and experience energy systems while also providing an actionable path forward for development.

Stronger utilization of Anticipatory Governance principles may help to more effectively incorporate community concerns into the energy infrastructure development process, supporting an equitable transition to a cleaner grid whereby large players such as wind energy developers, etc. traditionally have a large proportion of the directing power. This framework could likewise expose if a larger presence of other green energy technologies may be more applicable to a community’s value system, and for example prevent attempted development of a large wind

array in an area where centralized power generation does not fit with the community's values of independence and autonomy.

Research Question

The research question this paper explores is: *How could California's process for transitioning to a cleaner grid, particularly with regard to wind energy development, more meaningfully engage the community, help stakeholders imagine potential energy futures, and effectively integrate their concerns into the development pathway?* The question will be answered by looking at a case in Humboldt County. Without such analysis, the ongoing offshore wind developments could spark social opposition on the same magnitude as that seen in the past for onshore developments, leading to further community frustration and missed opportunities to address climate change. Recommendations to prevent such from happening must be found and integrated soon, lest the plans for offshore wind energy infrastructure become too solidified and cause denial of the project later on.

Methods

Data sources include five interviews with a local journalist, a local fisherman, a leader in the Redwood Coast Energy Authority directly influencing the pathway of offshore wind developments, an employee for the Humboldt County Planning and Building Commission, and a Natural Resource Specialist for the local Wiyot tribe. Local news sources such as the Lost Coast Outpost were analyzed for leads on potential community concerns regarding both the TerraGen onshore developments and floating offshore wind turbines. Agency reports came largely from the County of Humboldt's website and the Schatz Energy Center at the University of Humboldt.

A table was generated to compare across each case study how the aspects of engagement, foresight, and integration were utilized in the clean energy development process (Appendix A). The data was interpreted largely relying on if multiple sources verified a particular perception of the process. This analysis and interpretation approach helped to demonstrate where lessons could be learned from the failed TerraGen project for the ongoing floating offshore wind turbine developments. In particular, it focuses on finding potential intractable issues, or issues that are so unavoidable or immitigable that they could lead to the denial of a project entirely.

Results

The ongoing community engagement process surrounding the early-stage floating offshore wind turbine developments in Humboldt County is at large succeeding in meaningfully engaging the community, foreseeing future challenges, and integrating concerns into the development pathway. Yet, the leading agencies could continue to improve by learning from the mistakes in the failed TerraGen onshore wind process. Intractable issues may surface at a number of steps in the process, and must be anticipated if the wind projects are to be seen through completion.

Engagement

With regards to meaningfully engaging the community, a number of sources point to the largest misstep in the TerraGen process being the failure to consult the community earlier on in the process, particularly indigenous tribes. A number of public comments submitted following the release of the Final Environmental Impact Report (FEIR), a document detailing the pros and cons of the project and ultimately justifying its development, implore that the concerns

of the local Wiyot tribe be taken into account (Humboldt County Planning and Building Department, 2019). The Tsakiyuwit, or Bear River, ridge was a major piece of the proposed project and had been a sacred prayer ground for the community for centuries. Being located in private land, however, the external private company did not consider this to be an impediment to the development of the extensive turbine farm, or an intractable issue. This is further demonstrated in the appeal by TerraGen's subsidiary, Humboldt Wind LLC, following the first denial of the project that the project's benefits would "outweigh the significant unavoidable impacts" (Humboldt County Planning and Building Department, 2019, p.1). They listed statewide environmental, local and regional environmental, economic, infrastructure, and resource benefits but nowhere address that many local community members saw this project as one commenter described to be an "ever-present reminder of colonialism, the murder of [Wiyot] ancestors, and the theft of [Wiyot] lands" (Humboldt County Planning and Building Department, 2019, p.4). To the Wiyot people, building the wind farm on the ridge meant the desecration of a sacred site. The recovery of displaced culturally-important plants would not be enough to make up for this fact, and especially not the developer's last-minute offer at large monetary compensations (Natural Resource Specialist for the local Wiyot tribe, personal communication, March 22, 2021). The developer's ignoring of the Wiyot's intractable issue resulted ultimately in the County Board of Supervisors' denying the project. If those involved in the ongoing offshore wind developments are to learn from this failed process, they must take away the importance of exposing these types of intractable concerns early on and heeding them with their deserved amount of weight.

So far, many sources point to the agencies directing the ongoing floating offshore wind process being much better about early engagement of the stakeholder with the most concern, the

local fishing community. In response to asking whether or not RCEA has reached out about the developments, a local fisherman replied that "They have reached out. They came quite a while ago when this was first in the pipeline and talked about it. The other guys in the [fishing] association have talked more about it, and RCEA has been pretty up straight and forward. RCEA is made of local people and they don't want to alienate [the fishing community]" (Local Fisherman, personal communication, March 15, 2021). That being said, however, other members of the community believe that the engagement process falls into a habit of dividing stakeholder groups rather than having them talk to one another. This "divide and conquer" approach, as a local journalist put it, can work to (perhaps unintentionally) depower community concerns as it causes more confusion and disorganization (Local Journalist, personal communication, March 10, 2021). The Schatz Energy Center, a Humboldt-based group at the local university, did try to get ahead of this issue by hosting an extensive webinar series from September to October of 2020, involving a wide variety of stakeholder groups (Schatz Energy Center, 2020). Problems occur with making sure that this information is readily available to a larger portion of the community so that they can feel secure in being meaningfully included.

Foresight

Both projects engaged in the concept of foresight, or helping the community to imagine the future of energy development so that their concerns may be determined before getting too far into the process. TerraGen released artistically-rendered images such as Figure 2 to demonstrate what the project might look like from the city center. The Schatz Energy Center did the same for offshore wind turbines. An artist's rendering of a full-scale turbine being drawn out to sea may be viewed in Figure 3 and was part of the webinar series (Schatz Energy Center, 2020).



Figure 2. Artist's Rendering of Wind Turbines as Viewed from Town of Scotia (DeLapp, 2019).



Figure 3. Artist's Rendering of A To-Scale Turbine being Drawn out to Sea from Humboldt Inner Channel (Schatz Energy Center, 2020).

Though both parties engaged in foresight, a number of issues with the onshore development's foresight process were elucidated in interviews. It was noted that even though the Wiyot tribe was consulted regarding the placement of turbines, it felt as though they did not have real agency in influencing the path of development. Furthermore, one local member commented that "one of the ways that companies get you to become accepting of a project is to get you to agree to mitigations, which in this case the tribe didn't think the project was mitigable" (Natural Resource Specialist for the local Wiyot tribe, personal communication, March 22, 2021). They saw offerings such as to micro-site the turbines away from particularly biodiverse and sacred areas as one of these ingenuine attempts at "collaboration".

Integration

Engagement and integration are heavily interlinked, seeing that the earlier and more meaningfully stakeholders are engaged, the more likely their values, concerns, and comments are to have a measurable impact on the path of wind energy development. Regardless, components such as the degree to which the lead agencies legitimately considered the community's concerns once they were voiced can be analyzed to elucidate their openness to integration at large.

A number of instances demonstrate that even though the Wiyot people communicated that the impacts of the project were not mitigable, the developer did not take this to mean that the project must exclude the sacred ridge. They continued to assert that without the ridge, the project would not be built (Lost Coast Outpost, 2019). This progressed as far as to reports that one of the tribal elders was disrespected at a community hearing (Humboldt County Planning and Building Department, 2019). A number of sources point to a shift in rhetoric from open consideration of

tribal concerns to one of standoffish frustration on the part of TerraGen's community representatives. By and by, they considered the environmental, economic, and infrastructural benefits large enough to justify "a significant, unavoidable and unmitigable impact" on the viewshed of Bear River Ridge, acceptedly "a place of significance for the Wiyot people" (DeLapp, 2019, p.1).

For the offshore wind process, there have been extensive webinars to determine community concerns. Following these from the Schatz Energy Center, two new research areas have been initiated between the center and its partners. One focuses on reducing the cost of transmission for small to medium commercial-scale offshore wind projects on the north coast, and another involves "three-dimensional seabird distribution model for the California Current" (Schatz Energy Center, 2020, p.17). This does not mention the type of in-depth studies that have been requested by the fishing community in order to assuage their concerns about how their equipment might interact with undersea cables, amid a number of other concerns.

Discussion

This research connects to the theory of Anticipatory Governance in that it systematically elucidates where a stakeholder engagement process could improve in order to avoid future obstacles. It demonstrates the amount of power communities have over the development of new technologies and systems. They have the capability to deem a technology acceptable or unacceptable depending on their values and conceptions of the technology rather than its objective specifications. This serves to alert potential developers to the effort necessary to effectively integrate new systems into existing cultures and communities.

National and comprehensive studies exist demonstrating what leads to community acceptance of wind projects. The Lawrence Berkeley National Laboratory conducted a 4 year project collecting data from “a broad-based and representative sample of individuals living near U.S. wind power project... aiming to understand how U.S. communities are reacting to the deployment of wind turbines, and to provide insights to those communities considering wind projects” (Hoen et al., 2019, p.1). What they found was that “The most important component of perceived planning process fairness is developer transparency and openness. The ability of the community or individual to influence the outcome of the project (for example, the number or location of the wind turbines) is also significantly related to beliefs about planning process fairness. Planning process fairness, along with developer transparency and ability to influence the outcome, are in turn significant predictors of having a positive attitude.” Furthermore, the study found that “Compensation is not an indicator of perceived planning process fairness” (Hoen et al., 2019, p.6). The question is now why do developers such as TerraGen not heed this advice when vetting projects, and waste their time offering extensive compensation packages to communities who do not consider their land sellable (Greenson, 2019)?

Limitations of this research include that it is a small case-based study and not comprehensive enough to apply fully to dynamics across the state of California. Each locality has a unique history and stakeholdership and must take up the process of determining what is meaningful to their own community. Furthermore, interview evidence reflects the perspectives of each individual and therefore always contains an element of bias. The study lacked standardized questions, potentially leading to the priming of respondents on their answers. This was deemed acceptable in order to dive into the unique experiences and perspective of each individual.

In the future I would interview more people within the community, as well as include more quantitative analysis of the agency reports. I would also compare the developments in Humboldt to those in other Californian areas, or even to those on the Northeastern coast. For example, the Coastal Virginia Offshore Wind Project received its final approval necessary before beginning construction in June of 2019 and must have garnered some social opposition due to its location near Virginia Beach and the military activities that occur there (Bureau of Ocean Energy Management, 2020).

I will undoubtedly use this research to inform how I go about in my career developing renewable energy projects. Though I plan to begin in the utility-scale solar development industry, such work has important implications into what land we are using for the projects as well as what the community's opinions might be. All concerns must be treated as valid rather than being written off as Not In My Back Yard-ism (NIMBYism). Each concern is a representation of a value that is very real to whoever is communicating it, and at least should be considered with regard to finding possible alternatives. Overall, I will understand that this shift to a clean grid largely is one of bringing energy technologies visibly into a larger proportion of the country's daily lives rather than them being "out of sight and out of mind", and the transition may simply take a bit of adjusting to as well.

Conclusion

This research exists as a broader attempt across the nation and world to execute a historic transition of our grid to cleaner sources of energy. Time and time again, developers fail to prioritize the social aspects while vetting a potential project, utilizing aspects such as wind resources, land availability/price, and grid interconnection capability to decide whether it is

worth pursuing. As illustrated in the above analysis, this techno-centric view of energy development leaves blind spots in the process that can lead to failure. Next steps for anyone looking to contribute to this transition include developing robust, local systems to meaningfully engage stakeholders, help them envision the future of energy infrastructure in their area, and integrate their concerns into the development path.

I propose many recommendations to the RCEA and Humboldt County Building and Planning Commission regarding ongoing offshore wind developments. Many of these recommendations are adapted from ideas of those within the community. There appear to be a few key issues that would largely improve the process and ensure issues do not reach the point of being intractable, leading to the denial of proposed offshore wind developments.

1. Beginning research initiatives that focus very specifically on the concerns of fishermen, seeing that this is the largest body of stakeholders likely to present intractable issues and organize against the offshore wind developments. The fishing community is at large supportive of renewable energy; they simply want to ensure all of their questions are answered prior to construction and the resulting impacts on their abilities to fish (Schatz Energy Center, 2020). Studies/research includes how the subsea cable will fare in annual winter storms, what the process will be if fishing gear is lost due to entanglement with the subsea cable, how a magnetized subsea cable will affect marine life, etc.
2. Increasing cross-stakeholder engagement to allow for compromises to be found as well as prevent the “divide and conquer” approach from lowering the swaying power of community groups.

3. Forming a body of delegates to represent different portions of the community so that they are consulted throughout the process rather than at particular times. This will also help to address the burnout currently experienced in the community by having one individual stay intimately up to date with the developments' progress.
4. As the Schatz Center reports noted, having one repository to conglomerate information on this process would be helpful. There is general confusion within the community as to the current status of the project, and this would help to effectively spread knowledge and elucidate ongoing community concerns.

The takeaway is that without putting in this effort, we will not be able to reduce greenhouse gas emissions quickly enough to prevent the most disastrous of projected climate scenarios from becoming a reality. We cannot afford to lose another minute backtracking on proposed projects, nor commit continued environmental injustices in the name of a more equitable planet. A balance between both speed and equity must be sought to ensure that the new planetary systems we build are ones worth living in.

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Appendix

Appendix A: Table Used to Piece Apart Factors in Case Studies Relating to Engagement, Foresight, and Integration

	Case 1: TerraGen Onshore Wind Project	Case 2: Ongoing FOWT Developments
	Main Body in Power: TerraGen, external body; Humboldt Building and Planning Commission	Main Body Guiding Development: RCEA, made of community members
Engagement	Timing of public comment events	Timing of public comment events
	Did construction start before full public consultation?	Did construction start before full public consultation?
	number of public comment events	number of public comment events
	Rhetoric used when interfacing with public	Rhetoric used when interfacing with public
	Major public groups with an issue	Major public groups with an issue:
	Major public groups in support	Major public groups in support:
	Rhetoric used when discussing potential issues	Rhetoric used when discussing potential issues
Foresight	Amount of information disseminated to public regarding plans	Amount of information disseminated to public regarding plans
	Efforts to foresee how community might feel with regards to developments in future based on current values	Efforts to foresee how community might feel with regards to developments in future based on current values
	Tone of sources found in support	Tone of sources found in support
	Tone of sources found in dissent	Tone of sources found in dissent
Integration	Bodies with majority of power to integrate concerns into the development path	Bodies with majority of power to integrate concerns into the development path
	Attempts to integrate or otherwise assuage/compensate:	Attempts to integrate or otherwise assuage/compensate
	Timing of attempted integration	Timing of attempted integration

Appendix B: Contemporaneous Notes from Interview with Local Journalist

What is your general feeling of the public engagement process with regards to the clean energy transition in Humboldt/California?

- One thing is that the [Bureau of Ocean Energy Management] has come and done these presentations on something called the Energy Database and Gateway - studies and data on whale migration and seabirds and all of this, every time this is brought up experts says it is totally incomplete and not even usable. One thing that strikes them is that oftentimes the people of Humboldt County are thought of as some podunk world where you can come in and build a factory and people will be happy for jobs. It is actually a university town with environmental scientists and professors and tribes and people with areas of expertise - does not occur to say "let's see if there is a whale expert in Humboldt, yea there's like 4"
- Get idea from world and state and nation - people think it's this rural, pristine area, preconceptions not true at all
- Get forgotten a lot of the time
- State-wide policies and plans and regulations designed for the areas of the state that are drier, more populated, etc
- "Oh California, huge drought, limited water" - Humboldt is in the PNW, rains a ton, lot of water, not a drought issue unless in smaller areas
- A lot of preconceived notions, "if people just came here and asked people here they would learn a lot"
- "Divide and conquer mode with stakeholders"
- Authorities will say "we've met with fishermen and they're fine with the plans and we've met with tribes and they're fine with the plans. Then I'll call and ask the groups about if they really said that. The division of stakeholders into different groups is super odd"
- Panel discussion at state senator
 - Really great, really brief, everyone got 3 minutes to talk, really broad, best meeting on offshore wind she's been to - all of the BOEM and CEC meetings have been long, drawn-out, boring, one-sided
 - 3 hours

Do you feel as the opinions of the community are meaningfully incorporated into plans to develop energy infrastructure?

- Don't really know yet - aren't really many plans "as far as they know - RCEA submitted a bid for the lease, trump administration denied the vineyard wind energy thing in Mass., vineyard EIF was approved in Mass. because of Biden (had been denied by Trump), now it's back on track because of Biden. CPUC analysis of grid capacity - nonexistent, concerns about expanding the grid and transmission lines.
- **TerraGen - BIG CONCERN this is another resource extraction plan, energy not for us but to be extracted to big metro areas, transmission going to be super built out and cause fires and logging of old growth redwoods, etc.**
- "Haven't heard a peep about it since the pandemic"
- Got invited into meeting at Bay Area - consortium of groups who have funding to work on offshore wind energy
- Community engagement - don't wanna get paid
- Want to get consulted early, but its too early
- What they're talking about doing now is 8 - 16, maybe 10 - 12 turbines

- Heard from energy experts that no way that this could pencil out unless it was massive, seems premature and pie in the sky
- If navy changes mind and says Morro Bay could be developed then they will go that way
- “Ocean in Humboldt might be too rough”

Within the community what would you say is the general sentiment towards these developments from your perspective?

- There’s a lot of anger over TerraGen, some are angry because it got denied because we need to do something about climate change Some people are with the Sierra Club. Huge split in the environmental community - some are like we need every ren. energy project we can get and we needed it yesterday, then others like Richard Engel, then other people who are going to protect every inch of earth
- Huge solar thing on the cowpasture proposed, people are opposed to it because of the cow pasture - gonna be elevated off the ground so cows can graze beneath
- “There are a lot of people who say that we need to put solar panels on roofs and cannot afford to give up more earth for this stuff”

Do you feel as if there is the same amount of opposition, less, or support for the offshore wind developments in the works for Humboldt?

- Fishermen who oppose offshore wind energy, already can't fish in a number of places and don't want more ocean off limits to fishing
- A lot of people are really concerned about whether tribal issues are going to be a barrier to offshore wind
- A lot of people would like to see the offshore wind project for a reason or not
- Not necessarily concerns for indirect effects
- People are excited about the economic impacts - Humboldt could be the hub for offshore wind industry, bay for shipping channels and no obstruction at the port
- People looking for the next big thing and it seems far fetched
- **“The Humboldt Baykeeper is concerned about how much port development there should really be”**
- **“There is though a lot of benefit to cleaning up old industrial contaminated sites and redoing them. Want it to be kept clean”**

Miscellaneous notes:

- All about tribal consultation, did not come down to environmental issues, there were a ton of environmental issues - if it were just environmental issues they would have voted to approve it, may have had an appeal or a lawsuit but denied it because of tribal opposition
- Recent evolution of tribal consultation laws in California
- Hard to know exactly what went wrong because it’s all confidential
- Fairly safe to say that if they had done a better job of tribal consultation, resolved some of the issues before
- “How much would you take, a million” would have gone differently in private probably
- Legally not members of the public, sovereign nations supposed to be treated differently than members of the public
- Big mistake!
- Offshore wind project here as it’s proposed - project proponent is joint powers authority that board has reps from - local gov agencies
- Very different than big corp from out of area proposed project

- BOEM process is totally different
- Feels like it is going to be quite a different community engagement process for offshore wind
- Consultation presumably with tribes will happen with fed level as well as state
- When county gets involved for onshore, not going to be as much for the project
- Onshore is mostly former lumber mills and industrialized mills sitting dilapidated for a long time
- Tribes not worried about those areas because archeological resources already been obliterated
- Concerns for the bay for the fish and the species that rely on the bay
- TerraGen project was proposed on the top of a ridge that they regard to be sacred even though it is private property
- Sacred to Yurok tribe
- Working to reintroduce California Condors which need these big open ridgetop meadows!!! Hugely important
- Offshore - obvious now to need to consult with the Yurok tribe - biggest one, feels different!!! Totally different now because BOEM has two-part environmental analysis
- Wiyot - objected to TerraGen, tiny remnant, ancestral territory now mostly under private territory, decimated very early on by white invaders
- Yurok is very powerful in comparison
- Fishing rights
- Wiyot tribe doesn't have the staff or money
- Person to start with is not a tribal member - energy expert at Blue Light rancheria, Wiyot, rancheria is a small tribe, she's been involved in CEC and BOEM stakeholder group on offshore wind for a couple of years
- Jana Gannean
- RCEA is the project proponent, very different
- Community advisory panel to choose the partners that they were going to apply for the lease bid
- Chose the panel and sent the applications from all of the different companies proposing to bid on the lease with them
- Very long drawn-out process, been a ton of meetings and a bit exhausted about offshore wind meetings!!
- Meetings that are about offshore wind in California generally - did not know that this was being discussed in Humboldt region, had been having convos in morro bay for a long time - military was like this is a no go and then Humboldt and Mendocino Bay are now a thing, **“huh since when is this a thing in Humboldt?”**

Appendix C: Contemporaneous Notes from Interview with Local Fisherman

More context on fisherman: 52 foot boat, secondary fisherman, fish for albacore, crab, and salmon, on the board of directors for Humboldt fishers merchant association in Eureka

Are you concerned about the offshore wind developments and if so for what reasons?

- Yes very concerned, main reason is that they want to run a cable to the beach and out here the bottom shifts, very big winter storms, don't know how deep they're talking about burying the cable, don't know what would happen if a big winter storm came through and the cable became exposed, someone drops a crab pot on it and then tries to pull the pot
- Was catching albacore
- "Oh you can fish right next to them" can't imagine that they would let people do that
- Taking away grounds that have been productive in the past
- Does not see how on earth they would let them fish right next to the undersea cables
- One that pops into his head, doesn't see how it couldn't be a national security thing - getting right next to a turbine with a boat, concerns about terrorism?
- Who knows what the vibrations are going to do - scaring everything away, taking away another spot
- For albacore not really, for albacore a fisherman chases those things really far - wherever
- For long line guys
- ⇒ negotiation
- Guys who do longline black cod - anchor that drops down to the bottom, dragging cable back up
- If cable runs, can you set nowhere near where the cable is running under the ocean floor
- A lot of grounds that are protected for marine protection areas
- Highly migratory species of fish
- Was asking about could we negotiate and collaborate
- Most of the time for albacore was in international waters
- Other day was close and got a ton in that area - exactly where the wind farm would be
- **A common sentiment is that offshore wind developments would add further restrictions on what is already a hard job**
- **When his father started fishing, you could buy a fishing license and go fishing for whatever wherever you wanted. As times have changed and you need permits for this and that. He was born into the industry, and for a young guy it is hard enough to fish without a wind farm. He does not know what a big electrical cable is going to do with regards to affecting the migratory pattern of anything. How will the crabs be affected?**
- They want to make the project so big
- This ocean gets really rough. There are 75 ft swells
- 20 ft wave is pretty usual - winter
- **Can't keep the buoy anchored to the bottom, hard to believe that they are going to keep these giant wind turbines anchored, 5ft or 6 ft buoy**
- Buoy is pretty close
- Some of the roughest country on the coast
- How are we going to keep these wind turbines from trying to move
- If one breaks free, what's it going to do
- Grab gear out there in the middle of the season
- If hitting over 20 ft wave swells, hope it weathers the storm
- Each crab pot costs about \$300 or more
- Thought of it washing up on beach
- Crab gear getting dragged 5 - 10 miles

Does it feel like the RCEA and other groups have genuinely reached out to your community trying to figure out what you might be worried about with regards to these developments?

- They have reached out
- Came quite a while ago when this was first in the pipeline and talked about it
- Guys in the association have talked more about it
- Have been pretty up straight and forward
- Local people
- Don't want to alienate them
- To be honest a lot of the public does not realize where this project is at yet, another part is that as a society 95% of the public is not going to be affected by a wind turbine 20 miles off, if they don't see it then it doesn't exist
- Offshore wind turbine, doesn't affect them don't see it
- If they haven't done what they do for a living, hard to fathom that these things could be a problem

Could you see any ways in which the process could be better?

- Sure a little bit of this as well is not going to make everyone happy - gonna be hard to put a wind farm out in the ocean because everyone fishes for different things - not gonna please everyone, thinks the project is farther along, this is where we want to put it, more ideas of what they are going to do with the cable - **if a crab pot is going to be dropped on this cable and lost then what's the deal, want a better understanding of the what ifs**
- **How would it work out legally**
- If a wind farm goes in and I go out crabbing and hook crab pots to it and end up losing crab pots, would I call the RCEA and say that I lost a crab pot and then get a check or whatever?
- What are you gonna do if it wipes out the entire fleet?
- **Too many what ifs without a plan**
- If RCEA came tomorrow and said gonna put this in and you can't fish near them or within a mile
- Gotta get more finalized - been so many plans floating, which project are you actually gonna do, how many are there gonna be
- At first were gonna run the cable to Humboldt, last rumor was gonna be to go to San Francisco because the local plant couldn't handle the extra electricity - if the undersea cable runs all the way to SF gonna have lots of fishermen backlash
- Don't know what a cable would do
- If they did a study showing what would happen with cables would you feel better?
 - Would much rather see the turbines on land personally!!! Probably same with just about every fishermen, giant drop in megawattage as it runs through the cable - hard to think that the most cost efficient thing is to put it floating offshore
- When they break they spill out a lot of oil - what would happen putting in the water
- SO MANY UNKNOWNNS
- THINKS BEING ON LAND WOULD BE BETTER IDEA
- BUT UNDERSTANDS
- OUT OF SIGHT OUT OF MIND
- GONNA SCREW RADAR UP
- JUST PUT THEM ON LAND!!! WE'VE SEEN IT WORKS

Have you gotten to talk to any other stakeholders in the process, like tribal groups?

- no, not yet
- As it moves forward probably will
- Talked to others because they are friends

- Nothing like “this is gonna affect you me and me, let's sit down and talk about it’
- Once it moves farther forward, will have these conversations
- In Eureka, so many things going on
- Wind energy - giant internet cable from 3 of them - singapore, china but could be wrong, also want to build an atlantic salmon fish farm on peninsula
- Fatigue
- CAN EVERYONE JUST LEAVE US ALONE FOR A LITTLE BIT

Within your community what would you say is the general sentiment towards these developments from your perspective?

- Some of all of it - people that don't want these things here, understands that the world needs to move towards clean energy
- UNDERSTANDS THAT THE WORLD NEEDS TO MOVE TOWARDS CLEAN ENERGY- ALL FISHERMAN, MAKE LIVING OFF OF OCEAN AND DON'T WANT IT POLLUTED OR DYING
- HAS NOT BEEN COUNTY SUPERVISOR THING, NOT IN PAPERS, NO ONE CALLING HIM AND ASKING, NOT FAR ENOUGH ALONG FOR PUBLIC TO GET THEIR HANDS ON YET
- MOST WERE SO HAPPY WHEN TERRAGEN ONE WENT AWAY STILL CELEBRATING

Notes on why the public is interested in offshore wind now

- Here have had an issue with horrendous wildfires
- For 1 or 2 years were shutting off power everywhere
- Right about the time that the windmill became a thing, people were saying “my power will stay on all the time if you put this in? Cool go for it!”
- Good timing for wind energy
- Power stayed on
- Out of sight out of mind - forget

HONESTLY HAVING A FISHERMEN WHO SAT IN ON THESE MEETINGS, SAYING YEAH THIS WORKS OR NO THERE IS NO WAY IN HELL PEOPLE ARE GONNA GO FOR THAT - WOULD BE A GOOD IDEA MOVING FORWARD, MAKING SOME KIND OF PANEL AND HAVING FISHERMEN AND WIND ENERGY FOLKS AND WHOEVER ELSE, HAVE OVER, IF THERE WAS A PANEL THAT MET AND DISCUSSED, IF THEY HAD ONE FISHERMEN, COMMENT WOULD BE GOOD TOO, ONE FISHERMEN KEPT IN THE LOOP, find a fisherman who realizes it's not all about him which is hard to do, reports back, and goes back to panel

Appendix D: Contemporaneous Notes from Interview with Humboldt County Planning and Building Commission Employee

Humboldt County Planning and Building Department Employee

Humboldt County Planning & Building Department, noticed that you handled the environmental impact reports for wind developments and am curious about what role you play in determining whether wind developments will actually become a reality, and/or figuring out where they will be and who they will benefit?

- With the planning and building dept - planning department, would process land use development permits, conditional use permits, facilitate development, environment analyses
- Facilitate development, ensure that it's consistent with zoning and generally plan and environment standards and so forth
- Humboldt wind energy project was proposed here, fairly sizable, 60 wind turbines over 20 mile span, environmental impact report for that, project ended up dying because of contention because of weird parallax, people want wind and solar energy but when it comes forth they go against it, **big item was they didn't reach out to the Native American tribes until late in the game - proposed on sacred sites and so forth, didn't do any preliminary outreach**, before environmental impact report had scoping sessions - public meetings and get feedback and get a feeling for climate of folks, reach out and coordinate with tribes beforehand - didn't occur until they were well into EIR, once it was out for review there was a feeling that the tribes were "now just becoming aware of this"
- TerraGen reached out but ideally it falls on the lead agency, HUMBOLDT COUNTY - KINDA THE DECISION MAKERS, LITTLE ON OUR PART AND LITTLE ON TERRAGEN'S
- Hitting the different stakeholder groups
- Native Americans - always reach out as a priority

What are your top considerations and priorities in figuring out whether or not a project is going to be developed? Process for weighing the gives and takes for each project?

- Look at the different criteria under environmental quality acts - biology, aesthetics, whole series of impacts that you need to analyze, impact depending on the area, climate of the neighbors and so forth - visual is another concern that was raised, 600 feet in height
- TerraGen - visual simulations were light, far away

What is the department's way of incorporating community opinions into the development of the projects? What kind of sway do you all have?

- Always, **early engagement is one of the keys to success**, scoping sessions even before the project design is finalized, address and identify issues that may not have been on your radar

Going forward with clean energy developments

- Offshore - department of the navy is handling that, coastal development permit, developing within certain areas of the coast
- From the County, their focus in the Commission is how it is gonna intertie to the land
- Rely on the energy utility companies - experts in their own right,

Onshore wind projects?

- Might resurface - TerraGen is a reincarnation of a previous wind project proposed, Shell was the applicant, resistance right away because of big energy company, Shell in TerraGen's clothing

- Forecasted to see some more proposals
 - Early engagement, interesting - people like “yea we want renewable energy and yea this isn’t the right place - great we love solar and want solar, but they don’t want to see it!”
 - it’ll take time, people will get used to it
 - new, time will get used to seeing renewable energy projects

Appendix E: Contemporaneous Notes from Interview of Local Wiyot Indigenous Tribe Natural Resource Specialist

When did you become aware of the TerraGen onshore project and the ongoing offshore wind projects respectively?

- It was a lot and very exhausting, got the community on their side about the project, sort of shoved down their throats
- Late to the table for the planning and a lot of the biological survey work had been done without the community's knowledge from a company that is not local, mistakes in their cultural resource assessment, failed to consult with the Wiyot and got ancestral territory boundaries incorrect
- Heard rumors about it from some biology people
- Nearing a CEQA AB - 52 process for tribes, passed in 2014, went into law for 2016, being able to identify the whole land space as a cultural resource for different reasons, wasn't without thought to get tribal council
- His involvement was having known bear river ridge ecologically, ethnobiological perspective, one of those places where it just can't happen (developing wind turbines)
- One of the biggest biodiversity hotspots
- Offshore wind is sort of on the horizon
- Easy for them to decide that this is worth taking on
- Could be an offshore project that could generate hundred and hundreds of gigawatts of electricity
- Could be a gateway in for increased development down the line - lots of wind projects, easy to expand later
- Retrofitting

What is your general feeling of the public engagement process with regards to the clean energy transition in Humboldt/California?

- Process was exhausting
- Felt like they were on trial
- Some weird stuff
- One of the reps from TerraGen, Natalynne DeLapp started kind of becoming standoffish not with the tribe but whole community, changed whole dynamic from discussion to more intense
- Fine line, one of the ways that companies get you to become accepting of a company is to get you to agree to mitigations, which in this case the tribe didn't think the project was mitigable
- Regardless, would be a negative impact on biological and cultural resources
- One of the things that they offered was for them to take 300 bulbs from the prairie, well that's better than nothing. "Let's trade the Indians some blankets and a couple of tin cans and they'll sign our treaty." Carrot and stick type deal
- Whoever is evaluating the project, is it mitigable or are the developers getting you to be like "oh be part of our team", help us select the best sites
- Still believes in mitigating and working with them, so big and so many impacts
- Kinda off-putting

Were you ever offered ideas of what the future of wind energy infrastructure might look like in Humboldt?

- Knew that once they said where to put turbines, would be no way to stop the project, project was going to happen
- Definitely more suitable areas on the ridge that the tribe could have identified, ancestral bulbs getting ripped out and would have wanted to replant those plants somewhere else
- Bear river ridge is amazing, bunch of rare plants

What is the general sentiment now regarding clean energy transition?

- A lot of people are still for onshore wind, it was by a hair that this didn't happen
- **Environmental justice aspect to this - there are other ridges closer to arcada that have lots of wind!! Selected this area because a more rural area with fewer people to speak out**
- The thing that has come out since this is that offshore wind is coming
- Offshore wind will have other impacts but perhaps fewer impacts

Getting to talk to fishermen?

- Could be a lot of impacts there and hearing the fishing community talk
- Tribe not gonna have the energy to fight that fight
- Definitely pro rooftop solar
- Don't have tons of storage capacity yet for that
- How a lot of folks see it here
- Reduce your development footprint
- Solar on every rooftop
- **Every site that has already been developed to develop that instead of developing new land**

Cross stakeholder?

- Only time had that opportunity, the Schatz Energy Center did a whole offshore wind series, they felt bad that the TerraGen project fell through, affiliated with Humboldt State University
- Did a really cool event (some people said it was PR), he went, whole day where the fishermen were there, workshop series was definitely - really got to hear a couple of fishermen's really big perspectives from having fished in the Humboldt area for decades
- Fisherman - would be a hell of a lot easier to drive these things on top of the ridge
- Tribes are stewards of the salmon and such, interesting to see how the other tribes, what their comments would be

Comments with regards to offshore wind for tribe:

- Using offshore wind's coming to their advantage
- Takes a while to research
- Very specific to site location, don't quite know
- Haven't completed the survey work
- Of course they could be concerned about salmon
- What are the risks to fish - WHAT IFS
- Can these large wind farms affect their migration

Miscellaneous notes:

- Take home for him and a lot of tribes people, traditional knowledge is that you can't fix the earth with another technology, we're going to have to maintain large areas of habitat and forest and carbon sequestering land to also deal with climate change
- As we are looking for technologies, have to be very careful about where we are putting this tech and how develop our earth
- Thank you for taking this on, very important, hopefully slow things down, quit driving as much and all the stuff
- RCEA has reached out, thinks of them when he thinks of Schatz energy center, been a little while, weird year because of COVID, there's lots of folks that got some enemies - RCEA gets criticism for some of their decisions
- Lot of people against the biomass plants
- People trying to keep going
- Pro renewable energy development
- Set some cool goals, really aggressive, has some people concerned about the pace

Appendix F: Email Correspondence with Redwood Coast Energy Authority Employee

What do you see as your role in the energy sector in Humboldt/California? Why did you get involved?

- I'm director of power resources at Redwood Coast Energy Authority serving Humboldt County, California, which means I oversee day-to-day operation and some long-term planning aspects of our community choice aggregation (CCA) program. We are a small agency, which means I get to wear a lot of different hats compared to my counterparts at the larger CCAs. Makes my job interesting but also challenging to keep up with. I got involved because I was (and still am) excited about the CCA business model's potential to accelerate grid decarbonization in our community, while at the same time keeping electricity affordable and increasing local control over energy decision-making. We have been able to realize a lot of that potential in the program's first four years.

What from your perspective led to the denial of the TerraGen wind project? Can you imagine any particular places where the process could have been improved to prevent such a failure?

- The two main interest groups that opposed the project were local tribes who were concerned about the impact of the project on a site they consider sacred, and environmentalists who were concerned about localized impacts on habitat and the landscape. Notable there were also many environmentalists who supported the project for its decarbonization benefits. There were also a few residents with concerns about impacts on their property value and such, but I think that was a minor factor. In the end, I believe the tribes held the most sway in convincing a majority of the board of supervisors to narrowly vote down the project in a 3-2 vote. I definitely think the process could have been improved. Terra-Gen could have gone public with their plans earlier and engaged the community, looking for and trying to address concerns from the start. RCEA has taken a leading role on offshore wind planning and development, and we have been careful to make the process public and transparent, hopefully avoiding the T-G project's challenge in that sense.

What is your general feeling of the public engagement process with regards to the clean energy transition in Humboldt/California?

- Our organization has led this process. In 2019, we spent several months updating our strategic plan, conducting multiple public workshops and seeking the community's input through multiple means. We got positive feedback on the inclusive process we used, even from some parties who didn't get exactly the outcomes they wanted. See the "RCEA's RePower Humboldt" section of our planning page for details on that process:
<https://redwoodenergy.org/services/planning/>

What is your role in imagining/conveying ideas of the future of wind energy infrastructure in Humboldt? Do you know of efforts/ways in which entities try to get information out to the public about ideas for future clean energy infrastructure developments?

- I'm a big fan of creating effective visualizations to show people what a project will actually look like for key vantage points. This was done for Terra-Gen and has also been done for offshore wind. In both cases, the projects' visibility is pretty limited from the locations people are most likely to look from. I hope such visualizations assuage concerns of people who initially think the projects will dramatically impact the landscape.

Do you feel as the opinions of the community are meaningfully incorporated into plans to develop energy infrastructure?

- See my response to #3. Also, I will note that permitting is currently underway for the first local solar project to be built through our feed-in tariff program, and the County and the

developer have been doing a good job holding a public online workshop to discuss the project and take comment, and the developer also presented to the city council of the community closest to where the project will be built.

Within the community what would you say is the general sentiment towards these developments from your perspective?

- It's a mixed bag. There is strong support for renewable energy in principle, but when it comes to developing a specific project in a specific location there is a tendency for some NIMBYism to emerge, as we saw with Terra-Gen. Many people said they supported renewable energy but just wanted it built "somewhere else." It's important for people to understand 1) that available sites for renewable energy projects are not limitless, and 2) the time to develop projects at the pace needed in order to meet decarbonization targets is limited.

Do you feel as if there is the same amount of opposition, less, or support for the offshore wind developments in the works for Humboldt?

- I am optimistic that a critical mass of local interest groups will support offshore wind. In opposing Terra-Gen, many activists specifically said they would rather see offshore than onshore wind, so we'll have to see if we can hold them to that! The one group that has shown real concern, if not organized opposition, is the local fishing industry. A lot of work is happening to identify and address their concerns.