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**GREENING THE ECONOMY WHILE CENTERING JUSTICE:
A CASE STUDY OF GREEN BUSINESS INCENTIVES IN
RIVERSIDE, CALIFORNIA**

by

VANESSA M. LINCOLN

**SUBMITTED TO SCRIPPS COLLEGE IN PARTIAL FULFILLMENT
OF THE DEGREE OF BACHELOR OF ARTS**

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Abstract

This applied research project proposes incentives the City of Riverside could implement to attract green businesses in a policy memo and analyzes whether these incentives are aligned with the principles of just transition. Centering on the intersection between justice and sustainability, this project examines challenges and contradictions in the promotion of sustainability initiatives and transformative environmental change through the case study of Riverside. Analyzing the incentives proposed for Riverside through the lens of justice reveals how green business incentive policies must be altered to achieve a regenerative economy, and expands upon existing green economy, business incentive, and just transition scholarships. Three incentives are proposed, a skills development program at Riverside City College, a green business resource center, and a green innovation zone. Of these three incentives, the skills development program was the only one found to be fully in line with the principles of just transition. This project reveals that most green business incentives are not currently aligned with the principles of just transition, but that it is possible for them to be. The City of Riverside could center justice and equity by involving the community in the creation of the green business resource center, including Indigenous voices in the conversation shaping the green incentive zoning policy, and developing a metric to evaluate the incorporation of justice in its policies. This project indicates that green business incentives should center justice and that ensuring they do so brings society closer to a regenerative economy.

Key Words: green business; just transition; Riverside, California; green economy; policy memo; green tech

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Thank you to my contacts at the City of Riverside, Caleb Ragan and Councilmember Ronaldo Fierro. I always wanted my thesis to be something tangible and to hopefully cause real change, so thank you for giving me the opportunity to be involved in your sustainability efforts. Thank you to the individuals at the City of Riverside, including Councilmember Fierro, who let me interview them and so willingly gave me their opinions and thoughts on Riverside's sustainability efforts and my memo suggestions. Thank you to Nicole Cleary at CE-CERT, who took the time to meet with me to discuss OASIS and give me feedback on my policy memo.

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Introduction and Background

Sustainability initiatives are the new trend that cities worldwide are using to set themselves apart. City government officials and community members are becoming more excited about green policies. This feeling of excitement alone, however, does not necessarily result in policy implementation. For goals to be achieved, cities must have employees that are dedicated solely to sustainability efforts. Additionally, a conversation about the intersection between justice and sustainability has begun as more people advocate for environmental justice. A Riverside city official interviewed for this project made the statement that equity and justice mean something different to everyone, and that the first step to addressing issues of justice municipally is to define what it means in the context of the city (Interviewee A, personal communication, March 25, 2021). This applied research project explores this and other issues that exist at the intersection of justice and sustainability through a case study of green business incentives in Riverside, California. The project is a policy memo (see Appendix) that proposes incentives the City of Riverside could implement to attract green businesses. These incentives are then analyzed in terms of their ability to make cities more environmentally friendly and whether they are aligned with the principles of just transition. Just transition is described as a shift from an extractive economy to a regenerative economy that centers justice and equity. In this paper, I analyze the challenges and contradictions in the promotion of sustainability initiatives and transformative environmental change and build upon existing scholarship on green economies, business incentives, and just transition.

The greater significance of this research question lies in the fact that major structural changes need to be made to our society to get us out of the current climate crisis, and governments need know how to implement green policies that do not leave any members of

society behind. The principles of just transition are relevant to this issue because they provide a framework for ensuring that every part of the transition from an extractive to a regenerative economy supports all members of society. The principles of just transition have previously been applied to various topics such as energy democracy and food sovereignty, but they have not yet been applied to the green business sector. A green business is defined as “an organization that is committed to the principles of environmental sustainability in its operations, strives to use renewable resources, and tries to minimize the negative environmental impact of its activities” (Čekanavičius et al. 2014, p. 76). I believe that applying the principles of just transition to green business incentives will show that there is a way to incorporate green businesses into the regenerative economy. Discussion of green businesses is current and relevant in that green innovation is a rapidly growing sector of our present economy. This research bridges the gap between the opinion that we are limited to working within our current economic structure in the fight against the climate crisis and the opinion that we must abandon everything that is tied in any way to the extractive economy to achieve sustainability. A better understanding of the role of green businesses in just transition may be important in reconciling economics and environmentalism, leading to greater economic justice while simultaneously repairing our relationship with the planet.

I became interested in green economies freshman year of college while taking a class on distributive justice, where I decided to write my final paper on cap-and-trade. Sophomore year, I took a class on environmental justice and policy that helped me see the intersections between justice and sustainability and piqued my interest in how green policies could incorporate justice. When I heard that the City of Riverside was interested in greening their economy by attracting green businesses to the area, it seemed like the perfect thesis topic to incorporate my interest in

the green economy, my economics minor, and my desire to examine the intersection between justice and sustainability.

The City of Riverside is located in Southern California's Inland Empire, an area known for the high amount of truck traffic that passes through it as goods make their way from the ports of Los Angeles and Long Beach to the rest of the country. Due to this increased amount of traffic, the Inland Empire is subject to some of the worst pollution levels in the country. As of 2019, the Inland Empire had the worst air pollution in the country, with both San Bernardino County and Riverside County surpassing Los Angeles in air pollution levels (Vincent 2019). Due to these high pollution levels, city governments in the Inland Empire such as Riverside have begun efforts to make their economies greener in the search for a solution. For Riverside, this took the form of a new climate action plan. A major part of this plan includes the greening of Riverside's economy. To do this, it is imperative that the city attract more green businesses to the area. In 2016, the California Air Resources Board (CARB) decided to relocate its motor vehicle and engine emissions testing and research facility to Riverside. This was a \$366 million investment in the city and resulted in the creation of 400 high-paying jobs. A joint effort was made by the University of California Riverside (UCR), the City of Riverside, Riverside County, and the Greater Riverside Chambers of Commerce to acquire the facility. CARB decided to locate in Riverside due to the opportunity for growth it saw there and the ability to collaborate with the world-class air quality research already being done at UCR (Williams 2016). The location of CARB in Riverside is an advantage when it comes to the city's desire to attract green businesses. The fact that Riverside has one of the state's largest environmental regulatory agencies and is in one of the most polluted areas in the nation is important to consider when deciding how to move forward with Riverside's goals of attracting more green businesses.

Riverside is also unique in its political leanings relative to its surrounding areas. The Inland Empire is known for being a majority conservative population, but the city of Riverside itself is moderately liberal. As of 2019, 43% of Riverside's registered voters were Democratic, while only 28% were Republican (Reese 2019). Riverside's current city council is also considered to be progressive. Given its political leanings, Riverside represents a unique case study in how much of an effect a city can have on the conservative area surrounding it in terms of environmental legislation. Councilmember Ronaldo Fierro, the councilmember for whose office I wrote the memo on green business incentives, represents Riverside's Ward 3, which includes the central areas of the city. Fierro is the Chair of the City Council's Economic Development Committee and has committed to leveraging the location of CARB in Riverside to attract green businesses and jobs to the city. Two of Councilmember Fierro's core goals are sustainability and resiliency, through which he commits to meet present needs without ignoring future consequences (RiversideCA.gov n.d.). This background on Riverside's politics, as well as Councilmember Fierro and his stance on issues of sustainability gives context to the request for the memo I wrote and how it fits into the city council's goals for the city.

The policy memo I was tasked with writing furthers the City of Riverside's goal of greening its economy by suggesting actions for the city to take to attract green businesses and cleantech companies to the area. These suggestions were inspired by existing policies in other cities and research into both existing and historical federal and state policies. I expected to find that most current city policies regarding green businesses would not center justice and equity to the extent that the principles of just transition advocate for. I believe there exist challenges and contradictions in the promotion of sustainability initiatives and transformative environmental change, in that all the dominant business models, even green business models, are designed for

success in an extractive economy and therefore do not prioritize justice and equity. This is due in part to the lack of satisfactory business models for green businesses, which is frequently cited as a barrier to green innovation (Lee and Casalegno 2010). There exists a common preconception that sustainability and economic growth are inconsistent (Daly 1990). This contradiction can lead to the term “green business” being considered oxymoronic, because making a profit and being sustainable are viewed as mutually exclusive. These beliefs lead people to doubt whether it is even possible for the business sector to become fully regenerative. The concept of the regenerative economy, however, resolves the contradiction of sustainable development by changing the metric of economic growth so that it is possible for businesses to both make a profit and be sustainable. By analyzing the City of Riverside’s proposed green business policies through the lens of the principles of just transition, I shed light on the changes that need to be made in both green businesses and city governments for them to be a part of a truly regenerative economy. By applying the principles of just transition to the green business sector I hope to discover how green businesses and green business incentive policies can and should be changed to center justice and equity.

Methods

When deciding on a topic for my thesis I knew I wanted to focus on the concept of the green economy. My aim was to analyze the idea that being environmentally friendly and being good for the economy are characteristics that are mutually exclusive. I decided to do a project for my thesis because I wanted my thesis to make an impact and create change. This stems from my passion for fighting the climate crisis and my desire to contribute by taking action. In January, my major advisor and thesis reader, Susan Phillips, Interim Director of the Robert Redford

Conservancy for Southern California Sustainability, pointed me towards the City of Riverside and their new climate action plan as a potential venue for my project. I was able to work with the City through a partnership between the Conservancy and Riverside City Councilmember Ronaldo Fierro's office. I met with Caleb Ragan, assistant to Councilmember Fierro, in February, and he tasked me with writing a policy memo on green business incentives to help the city jumpstart its green economy. The green business incentives would be policies the city could implement or actions they could take to attract green businesses and cleantech companies to the Riverside area. Throughout the process of my research, I became even more interested and invested in the topic. I saw writing this policy memo not only as an opportunity to make a difference in Riverside, but also to analyze the concept of green businesses in the context of just transition. I believe one of the key challenges we face in transitioning to a regenerative economy is ensuring communities reliant on the fossil fuel industry are not left behind. Taking steps to make sure fossil fuel industry workers feel taken care of additionally helps to gain the political support for environmental issues that is so needed. Government business incentives are entrenched in the structure of the extractive economy, and I am interested in seeing how they could be altered to center justice and equity. The idea of a regenerative economy has always fascinated me and through this thesis I have been able to explore how we can get one step closer to it.

The creation of the policy memo for the City of Riverside required extensive research. I met weekly with Caleb throughout February and March to discuss my progress and receive feedback on my memo drafts. Caleb initially explained what the city was looking for and provided me with a prompt for the memo that outlined the sections he wanted me to include. Each week I would work on a different section and then send my draft to Caleb prior to our

meeting so he could read it and prepare comments. To write each section of the memo I had to do ample research into the history of green businesses and the cleantech industry, historical and current federal and state legislation relating to green business incentives, green business incentives cities globally have implemented and how successful they have been, and the economic theory behind business incentives. I found most of my sources by searching the scholarly literature for peer-reviewed articles but did receive a helpful source on the economic theory of business incentives from Nicholas Kacher, one of my thesis readers. For the federal and state legislative history and examples of policies other cities had implemented I looked at federal, state, and city government websites and official documents. I used all the information I found to form the bulk of the memo and completed a full draft by the end of March. I continued editing and adding to the memo through April. The memo will be presented to the Riverside City Council.

To prepare for conducting interviews and to gain a background on my subject, I examined existing scholarship on just transition, green economy, cleantech, and business incentives. Susan Phillips pointed me to two sets of principles of just transition, one from Movement Generation Justice & Ecology Project (MGJ&EP) and the other from Climate Justice Alliance (CJA). I compared these two sets of principles, as well as the organizations' other writings on just transition and looked for commonalities and differences. I searched the scholarly literature for peer-reviewed articles on foundational just transition literature and decided to focus on the scholarship that defines just transition as an intersection of climate, energy, and environmental justice scholarships. I researched the concept of a green economy to provide a foundation for looking at green businesses and to establish other core concepts that are relevant to green business. I also researched the history of cleantech to provide a concrete definition of it

and to illustrate the benefits of governmental support for cleantech companies. I analyzed different green economy concepts through the lens of the principles of just transition to examine whether the concepts centered equity and justice. This research prepared me for the conversations I needed to have with city government and green business employees about green business policies and justice.

To be able to answer my research question I needed to hear city government employees' opinions on whether and how Riverside is currently prioritizing justice. I also needed to determine the kinds of green business incentive policies that are feasible for Riverside. To get this information, I interviewed three city government officials, recorded and transcribed the interviews, and analyzed the responses. Caleb provided me with contacts of city government employees via his own personal connections. I reached out to his connections myself to recruit participants. I sent a recruitment email to each connection Caleb provided me, and for those who responded that they were willing I sent a consent form in the form of a Qualtrics survey to obtain their consent to participate and be recorded. Once I received the consent form, I arranged a time to meet over Zoom with the participant via email. The one participant who was an exception to this was Councilmember Fierro, whom I met with alongside Caleb to refine the policy memo and whom I interviewed at one of those meetings. I asked each participant questions regarding Riverside's sustainability goals:

- What is your understanding of the goals of Riverside in terms of it becoming a green city?
- What are the biggest challenges/opportunities that Riverside faces in terms of sustainability?

I also asked them questions about the feasibility of the incentives suggested in the policy memo.

Lastly, I asked a few questions about justice and green businesses:

- How do you see the City of Riverside incorporating justice into its goal of becoming a green city?
- Why is justice important to incorporate into discussions of sustainability?
- What do you think the role of green business is in creating sustainable cities?

I recorded and transcribed all the interviews via Zoom and sent each participant a debriefing email afterwards.

I analyzed the data I collected from the interviews by first annotating the transcripts and then taking notes on the participants responses under four categories, the participants' backgrounds, Riverside's sustainability efforts, the policy memo suggestions, justice within sustainability, and how green businesses influence sustainability. I took note of anything that was said by multiple participants and consolidated their responses into a smaller set of points answering each question. I used these responses to shape the policy memo and to determine next steps for Riverside in terms of incorporating justice into its sustainability efforts. Due to Institutional Review Board protocol, the only participant I will be referring to by name is Councilmember Fierro, all other participants will be referred to by job title only.

After completing my interviews, I applied the CJA principles of just transition, detailed in my literature review, to the green business incentives I had suggested in the policy memo. I went through principle by principle to determine whether each incentive satisfied all of them. For those that did not satisfy all the principles, I proposed alterations based on the principles that were not incorporated.

Literature Review

Before delving into my analysis of the proposed green business incentives for Riverside, it is important to establish the foundational literature of green economy, just transition, and business incentives that this paper builds upon. In this literature review, I will begin by defining relevant terms and then explore the existing scholarship on green economies that encompasses green business literature, as well as the relevant sub-concepts of sustainable development, the circular economy, and cost-benefit analysis. I will then examine the literature of just transition and introduce the MGJ&EP and CJA principles of just transition. Lastly, I will present scholarship on cleantech companies and business incentives that shaped my decisions on what green business incentives to propose in the policy memo.

Just transition refers to “a fair shift to an economy that is ecologically sustainable, equitable and just for all its members” (MGJ&EP n.d., p. 3). There are two different articulations of the principles of just transition, one from MGJ&EP and one from CJA. Each establishes the core idea of just transition in a slightly different way, but the two sets of principles have some commonalities. There are two branches of the scholarship on just transition, one that focuses exclusively on fossil fuel workers and another that conceptualizes just transition as a combination of climate, energy, and environmental justice scholarships. The green business incentives analyzed in this paper are incentives cities can implement to encourage green businesses or cleantech companies to establish themselves in their area. Cleantech companies are companies that offer many different innovative products and services with the end goal of optimizing the use of natural resources to create long-term commercial and environmental sustainability (Davies 2013). This paper adds to existing scholarship by applying the idea of a just transition and its principles to green business incentives. Previous scholarship has applied

just transition to the economy but has not applied these distinct principles to green business policies implemented by city governments. This paper will primarily be building upon or synthesizing existing frameworks, rather than contesting them.

To understand the scholarship on green business, it is important to establish the wider umbrella concept of the green economy. The green economy can be defined as an economy that “results in improved ‘well-being and social equity, while significantly reducing environmental risks and ecological scarcities’” (Loiseau et al. 2016, p. 362). A green economy is low-carbon, resource efficient, socially inclusive, and focused on the preservation of natural capital (Davies 2013, Loiseau et al. 2016). It proposes new production strategies that work with nature instead of against it. The term first emerged in response to the climate crisis and the designation of the Anthropocene when it was acknowledged that human activities have permanently altered the earth’s processes. The United Nations Environment Program (UNEP) was instrumental in promoting green economies as sources of growth and improved social well-being. The concept of the green economy has often been vaguely defined, an issue that has been raised at international environmental conferences such as Rio+20. The green economy has often been associated with scarcity, which follows from the fact that economics itself is based upon scarcity and the choices society is forced to make as a result. In a green economy, scarcity becomes both a driver and a constraint of growth, as measured by gross domestic product (GDP) (Bina 2013). A term that is commonly used in conjunction with green economy is “green growth,” which refers to the simultaneous fostering of economic growth and development and the preservation of natural assets (Loiseau et al. 2016). The two terms are sometimes used interchangeably to refer to various ideas related to low-carbon development (Bina 2013). Other theories and concepts that fall within the umbrella of the green economy include sustainable development (referred to by

Loiseau et al. as environmental economics), the circular economy, and cost benefit analysis (Loiseau et al. 2016). There are many other concepts that fall within the green economy, but the concepts mentioned previously are those that are most relevant to green businesses and cleantech companies.

Sustainable development, or the perspective that economic growth and the sustainable use of resources are not mutually exclusive (Loiseau et al. 2016), is the foundation of most green businesses and cleantech companies and is central to the challenges and contradictions within the promotion of sustainability initiatives and transformative environmental change that this paper explores. While Loiseau et al. refers to this concept as “environmental economics,” which may be a European connotation, I will call it sustainable development because the American definition of environmental economics is a field of study, rather than a perspective, as Loiseau et al. refers to it. At Rio+20 the UN General Assembly called for a focus on a green economy within the context of sustainable development (Bina 2013), and this has been a central focus of climate policies ever since. The purpose of examining the green economy in the context of sustainable development was articulated as a desire to reconcile economic policies and behavior with social and environmental needs. The green economy has also been viewed as an important tool that can be used to achieve sustainable development (Bina 2013). The principles of just transition as illustrated by MGJ&EP, however, are based upon the belief that any economic growth within our current extractive economy is not consistent with the sustainable use of resources (MGJ&EP n.d.). In this way, the principles of just transition conflict with the logic behind sustainable development.

The concept of the circular economy, on the other hand, is slightly more consistent with the principles of just transition. A circular economy is one that is industrial, but also restorative,

and that actively enhances and optimizes the natural systems it operates within (Loiseau et al. 2016). One of the key purposes of the regenerative economy as stated by MGJ&EP is ecological restoration. MGJ&EP states that in a regenerative economy, resources must be gained through regeneration, which requires the fulfillment of several key principles of ecology (MGJ&EP n.d.) that are consistent with a circular economy. One last green economy concept that is relevant to green business incentives is cost-benefit analysis (CBA). CBA requires that every project's costs and benefits be articulated in terms of the monetary value of an additional unit (Loiseau et al. 2016). This practice is entrenched in the principles and valuing system of the current extractive economy which, according to MGJ&EP, needs to be rejected. If society were able to achieve a just transition to a regenerative economy, valuing systems would be shifted, and CBA would need to be modified accordingly.

These green economy concepts each correspond with different types of solutions to the climate crisis and organizing them in such a way reveals which concepts could be part of a just transition. Given responses to the climate crisis can be divided into three categories, national stimulus packages (Almost Business as Usual (BAU)), proposals to green the economy (Greening), and proposals for socioeconomic transformation (All Change). Under Almost BAU falls stimulus packages with green components. This category is consistent with the current economic system's measurement of growth (GDP), as well as the idea that progress equals growth. This is also in line with mainstream and neoclassical Keynesian economic theory (Bina 2013), a "macro" view of the economy that sees it as dominated by large flows of expenditure and that advocates for the government to take an activist role (Heilbroner 1999). The second category, Greening, has an end goal of a low-carbon economy and efficient growth. Policies that fall under this category focus on science and technology and consider progress to be equivalent

to efficient growth. Greening follows the principles of both mainstream and environmental economics. The last category, All Change, follows the belief that prosperity can exist beyond growth, and focuses on degrowth and steady or stationary change. Transformative ecocentrism and radical movements that equate happiness and well-being with progress fall under this category. All Change is consistent with the principles of ecological economics (Bina 2013). The concept of sustainable development would be in line with Greening in that it works within our current economic system rather than aiming to change the system. The concept of the circular economy, on the other hand, would be consistent with All Change, because making our economy circular requires changing its fundamental principles. This shows that the circular economy is better aligned with the principles of just transition, which will be discussed imminently, because a just transition requires a complete reevaluation of our economic system.

The “transition” in just transition refers to the shift from the current extractive economy to a regenerative economy (CJA n.d.). The concept of just transition first emerged in the 1970s and is credited to Tony Mazzocchi, an American trade union leader who was a representative for the Oil, Chemical and Atomic Workers’ Union (CJA n.d., Pai et al. 2020). Mazzocchi sought the support of environmental groups in the fight against Shell regarding safety and health issues for workers (Pai et al. 2020). Central to the development of the concept of just transition was the commonly referenced ‘jobs versus the environment’ argument that the fossil fuel industry has used in response to proposed environmental regulations (McCauley & Heffron 2018, Pai et al. 2020). UNEP responded to this by asserting that green jobs are a necessary part of a just transition. Just transition eventually became linked to global warming and was recognized in both the Rio+20 Earth Summit and the preamble of the Paris Agreement (Healy and Barry 2017). As the concept of just transition evolved, its scholarship split into two related schools of thought

(Healy and Barry 2017, Pai et al. 2020). The first focused only on fossil fuel workers and fossil fuel dependent communities and followed more directly from the original concept (Davies 2013, Healy and Barry 2017, Pai et al. 2020). This school of thought focused on questions such as “who wins, who loses, how and why” in sectors such as energy (Healy and Barry 2017, p. 452). It also focused on just transition as a means to help fossil fuel communities through the transition from high-carbon to low-carbon energy (Healy and Barry 2017). The second school of thought expanded the definition of just transition to an intersection of climate, environmental and energy justice (Healy and Barry 2017, Heffron & McCauley 2018, McCauley & Heffron, 2018, Pai et al. 2020). This second and more recently developed school of thought is what the principles of just transition are derived from.

Various social and environmental justice organizations have since developed principles of just transition that can be used to evaluate whether a policy truly centers justice and equity. There are different articulations of these principles, but this paper will focus on those put forth by the organizations MGJ&EP and CJA. MGJ&EP developed a Strategy Framework for Just Transition, a model of the current extractive economy and the future regenerative economy with strategies to achieve the transition. The project articulates four principles for just transition: what the hands do the heart learns; if it is the right thing to do, we have every right to do it; if we are not prepared to govern, we are not prepared to win; and if it is not soulful, it is not strategic. “What the hands do the heart learns” refers to the restoration of human labor and its liberation from extractive capital markets. “If it is the right thing to do, we have every right to do it” highlights the fact that rights are asserted when they are exercised, emphasizes the inherent nature of all rights, and equates the infringement of rights with violence. This principle also states that a just transition must be founded on both the rights of Mother Earth and people’s

rights to the resources they need to lead productive, dignified, and ecologically sustainable lives. It additionally asserts that land must be restored to the commons and that a new commons of capital must be created that challenges the current organization of finance (MGJ&EP n.d.). Lastly, the principle is articulated as “not the right to have our needs met, but instead the right to meet our needs” and as an assertion of the right to self-determination (MGJ&EP n.d., p. 24). “If we are not prepared to govern, we are not prepared to win” highlights the importance of self-governance and requires current structures of governance to become more democratic and ecologically responsive (MGJ&EP n.d.). MGJ&EP writes “We must make the rules we need. And break the rules that serve the rulers” (n.d., p. 24). This principle advocates for deep democracy and asserts that people can meet their needs more adequately through self-governance than through a corporation or state mandate to govern. Lastly, “if it is not soulful, it is not strategic” directs us to hold our cultures and ancestral wisdom in a place of great importance. This has to do with the fact that we as humans are lost from the diverse ecological knowledge that our ancestors had and must reconnect with our cultures and ancestral wisdom to regain that knowledge (MGJ&EP n.d.). MGJ&EP’s principles are each multi-faceted with multiple requirements that a just transition must satisfy. This makes them slightly harder to use as a checklist of items that can be applied to a given transition policy.

CJA’s principles are derived from principles of environmental justice and the Jemez Principles for Democratic Organizing (CJA n.d.) and are the principles that will be used to analyze the green business incentives proposed in the policy memo for the City of Riverside. The Jemez Principles for Democratic Organizing were created to articulate common understandings that spanned the different cultures, politics, and organizations represented at the Working Group Meeting on Globalization and Trade in 1996 (EJ Net n.d.). CJA’s principles state that a transition

that is just moves us toward *buen vivir*; creates meaningful work; upholds self-determination; equitably redistributes resources and power; requires regenerative ecological economics; retains culture and tradition; embodies local, regional, national, and international solidarity; and builds what we need now (CJA n.d.). *Buen vivir* refers to the ability to “live well without living better at the expense of others” (CJA n.d., p. 4). This principle states that the rights of people, communities, and nature must take precedence over the rights of any individual. “Meaningful work” highlights the importance of the development of human potential and states that a just transition must create opportunities for the learning, growth, and development of people. “Self-determination” means that everyone has the right to be involved in any decisions that will impact them, which requires democratic governance. In this principle, CJA states that the people most affected by the extractive economy deserve to be leaders in the fight against the climate crisis. An “equitable redistribution of resources and power” requires the creation of new systems that work for all people instead of only a few. To create these systems, we must focus on regenerating those parts of the economy that suffer from the most inequities (CJA n.d.). “Regenerative ecological economics” states that a just transition must “advance ecological resilience, reduce resource consumption, restore biodiversity and traditional ways of life, and undermine extractive economies, including capitalism” (CJA n.d., p. 5). To do this, a just transition must focus on the re-localization and democratization of primary production and consumption. “Retaining culture and tradition” requires the creation of inclusionary spaces for all cultures and the payment of reparations to peoples that have had their land stolen from them or who were negatively affected by capitalism, colonialism, patriarchy, genocide, or slavery. “Local, regional, national, and international solidarity” refers to all people banding together to reject imperialism and militarism and ensure that the just transition is both liberatory and

transformative. Lastly, “building what we need now” requires community needs to be at the center of the just transition (CJA n.d.). CJA’s principles are each short and focused, which makes them easy to use to evaluate a given transition policy.

CJA’s principles are consistent with McCauley and Heffron’s scholarship on just transition that defines it as a combination of environmental, energy, and climate justice, because they are derived from principles of environmental justice. McCauley and Heffron argue that uniting environmental, energy, and climate justice creates a more comprehensive framework through which to examine the prioritization, or lack thereof, of fairness and equity in the transition away from fossil fuels. They focus on incorporating the elements of distributional and procedural justice that are present in environmental, energy, and climate justice scholarships into the concept of just transition. They also advocate for the inclusion of restorative justice, which they claim has not been adequately considered in environmental, energy, or climate justice (McCauley and Heffron 2018). Since CJA’s principles are derived from environmental justice, they incorporate elements of distributional and procedural justice. They also, however, include elements of restorative justice, such as the idea that reparations should be paid to communities that have long suffered from systems of oppression. In this way CJA’s principles are aligned with McCauley and Heffron’s definition of just transition.

MGJ&EP’s and CJA’s principles are varying articulations of the same message. While CJA’s principles are a longer list with each being more concise, MGJ&EP’s principles are fewer, but broader. To cover the full scope of the principles of just transition in this paper, both sets of principles will be considered. When applying a set of principles to Riverside’s proposed green business incentive policies to see if they center justice and equity, however, the CJA principles will be used since their brevity and specificity makes them clearer and more straightforward.

Though the two sets of principles have many commonalities, they also have some differences. CJA's scholarship on just transition differs from MGJ&EP in that CJA addresses false solutions, proposed solutions to the climate crisis that do not satisfy the principles of just transition. CJA articulates three indicators of false solutions, those that extract and further concentrate wealth and power; those that continue to poison, displace, and imprison communities; and those that reduce the climate crisis to a crisis of carbon. CJA highlights carbon trading and other market-based incentives as falling under the first category of false solutions (CJA n.d.). In this way, CJA's scholarship on just transition conflicts with scholarship on business incentives, discussed momentarily, which is heavily based in the current extractive economy. CJA also labels newer solutions such as titanium oxide cloud seeding or injecting carbon into the sea bottom as false solutions (CJA n.d.). This challenges scholarship on cleantech that describes these technologies as beneficial.

Scholarship on cleantech startups, cleantech companies that are just starting out, has found that in the U.S., governments are the best alliance partners for startups, surpassing universities and other private entities. Governments' abilities to finance research and development and to implement technology-push and demand-pull policies makes them powerful partners for cleantech startups. Additionally, governments have access to the codified knowledge that cleantech startups so often need. Access to important people is also increased when working directly with the government. Investors are more likely to see a company as worth investing in if they know they are in a partnership with the government (Doblinger et al. 2019). This connection between governments and cleantech indicates that governments should be involved in the creation of green economies because green businesses will be more likely to succeed if they are.

This provides a foundation for why governments are the best forum for developing green business incentives, a central assumption of this paper.

Lastly, scholarship on business incentives, actions implemented by governments to attract businesses to an area, must be addressed. Examining these incentives in the context of the scholarship on just transition helps reveal whether current best practices for incentive policies are centering justice and equity. The most common business incentives are job creation credits such as tax breaks or cash grants. Tax breaks can come in the form of property tax abatements, investment tax credits, or research and development tax credits. Customized job training is another type of business incentive that targets individual firms. The presence of small business development centers and business incubators can also incentivize businesses to move to an area. Incentives can be long or short-term depending on whether the government wants to pay incentives only in the first years of development or over a longer period. Long term incentives are difficult to implement in government since they may span the tenure of multiple different city leaders. Current best practices indicate that governments should consider benefit-cost ratios and cost per job when implementing business incentives (Bartik 2019). This contradicts just transition literature, which states that cost-benefit analysis as it exists in the current economic framework fails to consider what is most important in a regenerative economy (CJA N.d., MGJ&EP n.d.). The scholarship on business incentives is consistent, however, with much of the literature on green economies, which states that cost-benefit analysis is a useful tool for determining the welfare effects of a project or investment (Loiseau et al. 2016). Bartik concludes that infrastructure and skills development programs are two types of incentives that have higher benefit-cost ratios than other types of incentives (2019). Skills development programs are particularly relevant to green business because many green businesses are part of relatively new

industries that people already in the workforce may not have the training for. Overall, Bartik concludes that the quality of the incentive is what matters the most and that investing in infrastructure and skills development programs will only be successful if the programs are high quality. Bartik suggests that customized incentives that are provided up front will generally perform better than those that have payments far in the future or that are more generic (2019).

In summary, just transition scholarship is at odds with much of the scholarship on cleantech, green businesses, green economies, and business incentives that are heavily based in the current extractive economy. The MGJ&EP and CJA principles of just transition complement each other and can be used together to determine whether a given strategy adequately centers justice and equity. My thesis expands upon these scholarships by applying the principles of just transition to green business incentives to determine whether current green business models and the framework of green business policies are consistent with a just transition.

Findings

Through my research for the green business incentive policy memo, I determined three actions the City of Riverside could take to attract green businesses and cleantech companies to the area. The first would be the implementation of a skills development program at Riverside City College, the city's community college. This program would include several technical training courses related to jobs in the renewable energy sector and would ideally feature an internship program where the community college partnered with CARB or local green businesses to get students real work experience prior to graduating. The second suggestion is for the City to create a green business resource center that provides various resources such as executive

coaching, assistance in finding office space, and capital assistance to both startups and existing green businesses that need help getting their footing in Riverside. The green business resource center would ideally be located within OASIS (Opportunities to Advance Sustainability, Innovation and Social Inclusion), the green campus/green business park project being undertaken by UCR. The third and final suggestion included in the policy memo is for the City to designate a green innovation zone. This would be a combination of green zoning, which typically has to do with energy efficiency requirements and green building certifications, and an innovation district, which encourages tech companies to locate near each other to stimulate innovation.

After determining the three suggestions that were to be included in the memo, I applied the CJA principles of just transition to each incentive to see if they were adequately centering justice and equity. I found that the skills development program at RCC was consistent with all eight principles, while the green business resource center and the green innovation zone were only consistent with a few of the principles. The skills development program would satisfy moving toward *buen vivir* because it is an example of living well without living better at the expense of others. Giving people access to a technical training program so they can get jobs in the renewable energy industry improves society for everyone without hurting anyone. The program would clearly create meaningful work in that it invests in the development of human potential. It would uphold self-determination by allowing people who normally would not be involved in the greening of our society, those that cannot afford a four-year university, to take an active role in sustainability. It would equitably redistribute resources and power by giving the resource of a technical education to those who might not normally have that, again those people who cannot afford to attend a four-year college. The program would require regenerative ecological economics in that it would contribute to reducing resource consumption by providing

a workforce for the renewable energy industry. It would satisfy retaining culture and tradition in that RCC provides its students with inclusive cultural spaces, its cultural engagement and resource centers, such as the La Casa Engagement Center for Latinx students and the Umoja Project and Home Room Engagement Center for African and African American students (Riverside City College n.d.). The program would embody local solidarity by bringing people from the community together to create transformative change in society. Lastly, the program would build what the community needs now by centering community desires for technical training and high-wage jobs.

The green business resource center and the green innovation zone both satisfy the principles of creating meaningful work and embodying local solidarity in that they both focus on the development of human potential and would create a space where the community could work together to transform their society. They both, however, fall short on the other principles. The green business resource center would fail to equitably redistribute resources and power or uphold self-determination. Equitably redistributing resources and power requires a focus on lifting up disadvantaged members of society (CJA n.d.), and a green business resource center without special programs for marginalized groups will not do that. Upholding self-determination requires the community to have a voice in decisions that impact them (CJA n.d.), which will not be the case if the green business resource center is created by the City in isolation from community members. The green innovation zone would fail to retain culture and tradition. This is because zoning constitutes the designation and division of land, while the principle of retaining culture and tradition requires the payment of reparations to peoples who have had their land taken away from them (CJA n.d.). While these two incentives fall short on other principles as well, I believe the incentives could be modified to better incorporate these three principles.

From the interviews I conducted I received perspectives on Riverside's sustainability efforts, feedback on my memo suggestions, and insight into the intersection between justice and sustainability and the importance of green businesses. I interviewed three Riverside city officials, the Utility General Manager, Councilmember Fierro, and the City Manager, who also happens to be the Chief Sustainability Officer. A few challenges and opportunities for Riverside in terms of sustainability stood out because they were cited by multiple participants. One such challenge is that Riverside does not currently have a dedicated staff for their new Office of Sustainability. Currently the Office of Sustainability is staffed by people from other departments who have other responsibilities, which is difficult because the city's new climate action plan requires a lot of work to be done (Interviewee A, personal communication, March 25, 2021; Interviewee C personal communication, April 9, 2021). In particular, the City needs to have someone who can dedicate all their time to the office in the position of Chief Sustainability Officer because there is a need for someone to be driving the effort, and currently no one is because all the employees have other responsibilities as well. Another challenge that was cited was the fact that Riverside is close to fifty-fifty in terms of its political climate. This leads to a lot of votes being tight and places a lot of importance on compromise (Interviewee C, personal communication, April 9, 2021). Lastly, it was mentioned that convincing and reassuring community members that they will not be negatively impacted by sustainability measures is another challenge the city is facing (Interviewee B, personal communication, April 5, 2021; Interviewee C, personal communication, April 9, 2021).

In terms of opportunities the city has for growth in the sustainability sector, the fact that it owns its own local utility is an advantage (Interviewee A, personal communication, March 25, 2021; Interviewee B, personal communication, April 5, 2021). Cities with existing utility

structures that are private often run into barriers when implementing sustainability initiatives because the private utilities are resistant to change. Another opportunity for Riverside is the location of CARB in the city (Interviewee B, personal communication, April 5, 2021). The presence of such a large environmental regulatory agency in the area is already a draw for green businesses who want to locate nearby. Lastly, Riverside's size was cited as an opportunity for the city in terms of sustainability. The fact that it is a medium-sized city means that it is big enough to have the capacity to undertake robust environmental initiatives, but also small enough where it can involve the community in those initiatives (Interviewee A, personal communication, March 25, 2021).

In addition to gaining perspective on Riverside's sustainability efforts, I was able to get feedback on my memo suggestions through my interviews with city officials. Regarding my proposal of a skills development program at RCC, I received feedback that it is essential to make sure the program has a pathway for its students to be able to acquire jobs upon graduation. This would require local green businesses to be willing to partner with the program to provide internships or work experience that would allow the students to be better prepared for the workforce come graduation time. I also received the suggestion that the program include not only technical training courses, but also courses that would prepare students for being involved in green business on the data science side. In terms of the green business resource center proposal, I was warned that the city budget is currently very tight because of the pandemic, and that it might be difficult to get the funds together for such a project (Interviewee A, personal communication, March 25, 2021). I was informed that a previous incubator project had been proposed, EXPERIENCE, but that there had been issues because too many parties were involved in the project. Based on this experience, it would be important in any green business resource

center project going forward to only involve those parties who need to be involved to avoid having the same “too many cooks in the kitchen” situation. I received overall positive feedback on my suggestion of the green innovation zone and was informed that Riverside is currently working on the implementation of an innovation district that could be a good venue for incorporating the proposed green innovation zone (Interviewee C, personal communication, April 9, 2021).

When I spoke to the participants about the intersection between justice and sustainability and Riverside’s incorporation of justice into the city’s sustainability efforts, there was one key takeaway that I received. It was mentioned that equity means different things to everyone, and that Riverside has yet to determine what exactly equity means in the context of the city and its community. This could take the form of the city developing a metric to use to evaluate projects’ success in reaching marginalized people in the Riverside community (Interviewee A, personal communication, March 25, 2021). Though the city still has work to do, I also received information on how Riverside has already been incorporating justice into its sustainability efforts. The city is currently working on a light rail project to increase accessible, affordable, and clean transportation for residents. The goal behind the project is to help eliminate the discrepancies between higher and lower income residents in their modes of transportation and the amount of time they have to spend in the car (Interviewee B, personal communication, April 5, 2021). Another aspect of justice the city has been working on is involving the homeless in community decisions, and they hope to continue this by involving them in decisions related to sustainability (Interviewee A, personal communication, March 25, 2021). The city is also continually working on involving community members and soliciting community input as it makes its way forward in its new climate action plan.

Finally, I asked participants their opinions on green businesses and why they are important to sustainability. The answers I received were technology-focused; they centered on green businesses' role as the testing and modeling centers for new technology. One participant referred to green businesses as “the engine to get the market to a place economically to be able to adapt new technology” (Interviewee A, personal communication, March 25, 2021). Another called green businesses the “ground zero for technology” (Interviewee B, personal communication, April 5, 2021). Overall, the consensus was that without green businesses, society would not have the green technology they produce and would not have a way to transition these technologies into society. Green businesses are seen as centers of innovation and development and therefore are viewed as assets by cities like Riverside.

Conclusions

This project explores whether green business incentives are adequately centering justice and equity. After researching green business incentives in cities around the world, I conclude that most green business incentives are not currently centering justice and equity to the extent that is required by the principles of just transition, but that it is possible to alter existing business incentives to better incorporate these considerations. In applying the CJA principles of just transition to my proposed green business incentives for the City of Riverside, I discovered that two out of the three suggestions did not fully satisfy every aspect of justice illustrated in the principles. These two suggestions, the green business resource center and the green innovation zone, can, however, be altered to incorporate more aspects of justice.

To address the principle of self-determination, the city should involve the community in the creation of the green business resource center. This could take the form of regular community forums being held that shape what the center will look like where community members can articulate their needs and how the center could be most helpful to them. This would acknowledge and honor the community's right to be involved in decisions that impact them. In addition, to address the principle of equitably redistributing resources and power the city should consider prioritizing or including programming specifically for POC-owned green businesses as a part of the center. This would put the focus on regenerating parts of the economy that suffer from the most inequities by lifting up and empowering POC communities who are often the hardest hit by environmental injustices.

For the green innovation zone, to address the principle of retaining culture and tradition the city should include Indigenous voices in the creation of the zoning policy. Zoning divides and designates land that was once stolen, so to ensure a focus on justice in a zoning policy, local Indigenous voices must be centered and upheld. This could take the form of a forum specifically for local Indigenous peoples to help shape the zoning policy. This centers justice by ensuring disadvantaged Indigenous communities have agency over a policy that will alter the way land is used.

Lastly, in concurrence with my interview findings, I suggest that the City of Riverside develop a metric to evaluate its policies based on how well they reach marginalized community members. This metric could be based on the principles of just transition and use the principles or a version of them as a checklist for city policies, or the city could develop an entirely new metric. This would allow city officials to objectively evaluate all policies in terms of justice and ensure that all policies are adequately centering both justice and equity. A metric like this would require

Riverside to consider justice every step of the way as it moves forward with its new climate action plan and not leave any members of society behind in its transition to a green city.

If the City of Riverside implements the three suggestions in the policy memo with the specifications I have suggested for the green business resource center and the green innovation zone, the city will be able to attract green businesses to the area while simultaneously increasing justice and equity in its sustainability initiatives. This would provide an example for other cities to also prioritize justice and equity in their transitions to becoming green cities. If, in the transition from the extractive economy to the regenerative economy, governments only focus on sustainability and disregard justice, the transition will be at the expense of already marginalized communities. These are the communities that have been suffering the most from environmental injustices throughout history, and the only way we can truly achieve sustainability is by not only ensuring they are taken care of, but by also including them in the environmental decisions being made. These communities have wisdom that comes from decades of experiencing the negative effects of pollution and climate change, and we will not be able to reach a fully regenerative economy without them. By examining green business incentives in the context of the principles of just transition, my thesis shows that these incentives can and should focus on justice, and that ensuring they do gets us one step closer to a regenerative economy.

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Appendix: Policy Memo

How Local Government can Kickstart a Green Tech Revolution in the Inland Empire

Vanessa Lincoln – Robert Redford Conservancy for Southern California Sustainability

INTRODUCTION

Green tech is currently one of the fastest growing industries in the world. With the climate crisis continually worsening and the fate of our planet looking more dire each year, innovators are stepping up to the plate and using their ideas to make a difference. The City of Riverside is uniquely positioned to become a new center of green tech, as long as the government takes the next step in implementing key green business incentives, actions that will attract green businesses to the area, to put the city on top of companies lists of places to locate.

The re-location of the California Air Resources Board (CARB) to Riverside is already a draw for green tech companies. Other advantages Riverside already possesses in terms of attracting green businesses include:

- California’s state and federal commitments and funding to accelerate the pace towards a net zero carbon economy
- The sunseting of many employees at the South Coast Air Quality Management District (SCAQMD)
- Inland Southern California’s investment in large initiatives such as OASIS (Opportunities to Advance Sustainability, Innovation and Social Inclusion), Transformative Climate Communities (TCC), and Inland Economic Growth and Opportunity (IEGO)’s Sustainable Logistics Center of Excellence
- Investments from the California Energy Commission (CEC) and private firms to support green tech transfer activities in Riverside

These factors are all contributing to transforming the Riverside area into a hub of green tech and sustainability research and innovation.

By implementing key green business incentives as part of the city’s new climate action plan, Riverside will solidify its status as a frontier of green innovation.

HISTORY AND BACKGROUND OF THE INDUSTRY:

Greater investment in the green tech industry started in the mid-2000s, when investment grew by 60% between 2006 and 2007 alone. In 2008, this bubble burst due to the Great Recession, and a downturn in private investment lasted until 2016 (The VINCI Group 2019). As part of the U.S. financial crisis stimulus, however, the government increased spending on clean energy research and development (Brennan 2020). By 2017, the green tech industry in the U.S. was

more profitable than the airline industry and almost as profitable as the pharmaceutical and consumer electronics industries (Marra et al. 2017).

In 2020 the green tech industry continued to boom despite the pandemic. Businesses bought a record amount of clean energy last year, with an 18% increase from the amount bought in 2019 (Scott 2021). According to predictions, this trend will continue, with the industry projected to have a revenue of \$57.8 billion by 2030, a \$49.5 billion increase from 2019. Looking at existing areas of green tech, green building is predicted to hold its position as the frontrunner of the industry until at least 2030. As for new developments, artificial intelligence is predicted to be one of the fastest growing technologies incorporated into the sustainability sector. Looking forwards, while North America was still the biggest green tech and sustainability market in 2019, the Asia-Pacific region is expected to experience the most growth in the near future (Prescient & Strategic Intelligence Private Limited 2020).

While the U.S. continues to be a leader in green tech, other countries are increasingly becoming power players in the market. Alongside the U.S., the European Union and Japan have the highest numbers of granted patents in green tech (Brennan 2020). China has also established itself as a forerunner in green innovation. China's early efforts in solar, wind, and energy storage, along with its low labor costs, openness to foreign manufacturing companies, and state-created demand helped establish the global green energy industry by lowering initial costs and creating artificial demand. In recent years China has become a world leader in electric vehicles, renewable energy, and energy storage (Malcomson 2020).

These efforts, however, would not exist without federal and state governments setting an example for industries and city governments to exceed. Throughout the history of the green tech industry, there has been a consensus that governments play an important role in its growth. Unlike other sectors of tech, the higher risk research and development of green tech requires governmental support, whether it be local, state, national, or international. Currently, the U.S. leads in financing of green tech (Brennan 2020), and this will hopefully only grow under the Biden administration.

BACKGROUND OF GOVERNMENT'S ROLE IN GREEN TECH:

Though green tech had not yet become an industry, federal support for other types of green business existed prior to its emergence. Executive Order 13101 – Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition, was passed in 1998 and encouraged increased use of green products such as recycled content, environmentally preferable and biobased products. Similarly, the following year Executive Order 13134 – Developing and Promoting Biobased Products and Energy, expanded Federal requirements for the procurement of biobased products and services, and aimed to triple U.S. bioenergy and biobased products use by 2010 (Office of the Federal Environmental Executive n.d.).

In 2009, during the depths of the Great Recession, the Obama administration passed the American Recovery and Reinvestment Act as an attempt to revitalize the economy. The act took

steps towards a new energy economy such as replacing the federal fleet with more energy-efficient vehicles and converting and constructing new federal buildings into high-performance green buildings (U.S. General Services Administration 2018). This represented one of the first times federal environmental legislation had been passed with the intention of job creation in the green business sector. The act also established a new investment tax credit to incentivize development in the American renewable energy manufacturing sector. The investment tax credit is equal to 30% of a qualified investment, which includes any investments in equipment or technologies that produce energy from sun, wind, geothermal, or other renewable resources, investments in fuel cells, microturbines, or energy-storage systems to be used with electric or hybrid vehicles, investments in equipment that refines or blends renewable fuels, or investments in equipment or technologies that are related to energy-conservation such as lighting or smart grids (Gillibrand 2010).

Similarly, the December COVID-19 pandemic relief bill included \$35 billion in spending on energy research and development (St. John 2021). It also extended the Investment Tax Credit for solar power for two years, the Production Tax Credit for wind power projects for one year, and offshore wind tax credits through 2025 (St. John 2020). This once again represented the federal government's support for green business and belief that supporting green business is a way to repair a struggling economy.

The federal government also has established several programs to support and encourage green business. One of these is the Environmental Protection Agency's Small Business Innovation Research (SBIR) Program. The SBIR Program supports small businesses, defined as businesses with 500 or fewer employees, in the development and commercialization of new environmental technologies. Particularly, the program looks for innovative ideas that would further the EPA's mission of protecting human health and the environment. The first phase of the program offers \$100,000 to awardees to develop a "proof of concept" of the technology, while phase II awards up to an additional \$400,000 (EPA 2020).

In his short time in office, President Biden has passed a swath of executive orders that aim to encourage the adoption and continued innovation of green tech. One such executive order requires federal agencies to seek out carbon pollution-free sources for their electricity, as well as zero-emission vehicles to encourage the creation of stable, union jobs in clean energy industries. This order is consistent with Biden's campaign promise to spend \$400 billion federally on renewables, batteries, and electric vehicles. The executive order also includes a requirement that every federal agency create a plan to prepare its facilities for the impacts of climate change, which could result in increased demand for microgrids and backup power systems, as well as retrofits. The order also directs federal agencies to accelerate the siting and permitting processes of clean energy and transmission projects (St. John 2021). These executive orders are part of Biden's Build Back Better plan, a large component of which is stimulating the green business sector with the goal of job creation. The Build Back Better plan also includes a section on clean energy innovation. In this section Biden aims to increase federal procurement

by \$400 billion in his first term by purchasing clean energy inputs such as batteries and electric vehicles. He aims to solidify the U.S.'s position as the world's clean energy leader by accelerating research and development investment in clean energy, transportation, industrial processes, and materials. Some concrete steps in this section of the plan include the creation of a new Advanced Research Projects Agency on Climate that focuses on affordable technologies that would help the U.S. achieve 100% clean energy. Biden plans to accelerate innovation in supply-chain resilience by investing in research, and national laboratories, especially in high-performance computing capabilities. Lastly, Biden plans to strengthen land-grant universities, Historically Black Colleges and Universities, and other minority serving institutions to ensure diversity in the green workforce (Biden Harris n.d.). Based on Biden's actions so far and his plans, federal government support of green tech will continue to increase, and hopefully catch up with some state governments that have been ahead of the federal government in terms of sustainability.

California is certainly one such state that pushed for climate legislation in response to Trump administration rollbacks of environmental protections, and has consistently been on the forefront of environmental policy in the U.S. As early as the late 1970s and early 1980s, California provided incentives for the creation of renewable energy in the form of tax credits and subsidies. From the mid-1980s through the mid-1990s these clean energy efforts subsided, but by the late 1990s the state was pursuing them even more aggressively (Biber 2013). By 2002 the state had passed a renewable portfolio standard requiring all California utilities to source 20% of their electricity from renewables by 2017. The California Clean Cars Bill (AB 1493), also passed in 2002, was the first piece of legislation in the U.S. that regulated automobile carbon dioxide emissions. This represented a significant advancement in air pollution policy in that it expanded the definition of pollutant to consider a given substance's contribution to global warming (Paine 2005). The passage of the Global Warming Solutions Act (AB 32) in 2006 and the Sustainable Communities and Climate Protection Act (SB 375) in 2008 additionally spurred innovation in green tech by instating economy-wide regulation of greenhouse gases and setting regional targets for reduction (Institute for Local Government 2015). Between 2006 and 2010 California received 40-50% of all venture capital investment in U.S.-produced renewable energy/cleantech and registered more patents in the cleantech field than any other state. This is considered by many to be a result of the state's strong environmental policies (Biber 2013).

In 2012, the state passed the California Clean Energy Jobs Act (Proposition 39), which altered the corporate income tax code to allocate \$550 million each year to the California Clean Energy Job Creation Fund for use in local educational agencies to promote energy efficiency and clean energy projects (Senet 2015). In 2015, California passed the Clean Energy and Pollution Reduction Act (SB 350), which promoted an increase in deployment of clean energy technology. The act pledges to increase building energy efficiency statewide by 50% by 2030 and increase the amount of renewable energy utilities are required to purchase to 50% by the same year (Pyper 2015).

California has several statewide mandates in place that create opportunities for green businesses. The California Green Building Standards Code (CALGreen) is the first state-mandated green building code in the U.S. It was instated to promote positive environmental impact principles and sustainable construction. The code applies to all newly constructed residential structures and additions and alterations to existing buildings (California Department of Housing and Community Development 2021). The Electric Program Investment Charge (EPIC) Fund, administered by the CEC, requires electric utility corporations to add a surcharge to ratepayers' utility bills that goes to fund renewable energy research and development (Senet 2015). These two mandates create a market for green tech in the construction and energy industries.

While these mandates create a market for green businesses, California also has several programs that directly incentivize or support environmental innovation. The CEC's Research, Development and Demonstration Division has a program called the Energy Innovations Small Grant Program that provides up to \$95,000 for hardware projects and \$50,000 for modeling projects created by small businesses, non-profits, individuals, or academic institutions to fund research related to energy innovation (EPA n.d.). The California Alternative and Renewable Fuel, Vehicle Technology, Clean Air, and Carbon Reduction Act of 2007 (Assembly Bill 118) created the Alternative and Renewable Fuel and Vehicle Technology Program, which invests up to \$100 million annually in transportation projects throughout the state, with a focus on helping achieve the state's climate change, petroleum reduction, and zero-emission vehicle goals (California Energy Commission n.d.). Assembly Bill 118 also created the CARB Air Quality Improvement Program, a voluntary incentive program administered by CARB that funds clean vehicle and equipment projects, research on biofuels production and the air quality impacts of alternative fuels, and workforce training (EPA n.d.). CARB had another program, the Innovative Clean Air Technologies Program, that co-funded the demonstration of innovative technologies that reduce air pollution, but the program ran only from 1993 through 2008.

While California and a few other state governments have been at the forefront of much environmental legislation promoting green tech, cities have also begun to take matters into their own hands and have started implementing their own policies.

IDENTIFIED MUNICIPAL BEST PRACTICES:

Cities around the world have been implementing incentives to attract businesses to their area for years. While green tech is the now the next big industry cities hope to attract, tech businesses in general have been in high demand for a long time and continue to be sought after by city governments. In 2017, Amazon announced plans to build its second headquarters (HQ2), prompting 238 cities to submit bids for a chance to be selected as the location. 26 of these bids were released publicly and included incentives such as altered tax structures and infrastructure improvements (Jensen 2019). One of the winning locations, Arlington County in Virginia, promised to implement incentives such as spread-out payments to Amazon using revenue from a projected increase in hotel taxes and an agreement to give two-days written notice for any

requests made of the company under the Virginia Freedom of Information Act. The county agreed to give Amazon up to 15% of their transient occupancy tax, an existing tax on hotel rooms, as long as the company met certain agreed upon numbers for land occupancy (Yurieff 2019). Amazon's final selection of Arlington County, however, showcased that offering the largest monetary incentives did not guarantee a win. Arlington's incentives were smaller than many other competitors, but their bid focused more on investments in workforce development and infrastructure. This revealed that investments that drive economic development are more attractive to tech companies like Amazon than the size of a city's incentives (Jensen 2019).

When it comes to green tech, cities globally are putting their best foot forward in their goal to become the center of green innovation. Some of the world's most sustainable cities have implemented successful incentives to encourage green business and green tech.

- **Oslo, Norway**, known as one of the greenest cities in the world, ensures its municipal pension fund is only invested in green projects that are not fossil-fuel based. The city has set an ambitious goal of having a car-free city center by 2030 (Rote 2017), which will greatly reduce its emissions and create a more pleasant city environment. Oslo's program Future Built identifies sustainable pilot projects with the goal of developing carbon-neutral areas of the city, as well as impressive architecture. The city also offers tax credits, access to public transport lanes, and waived tolls for electric vehicle owners (Rote 2017), which contributes to creating a green culture in the city that is attractive to green businesses.
- **Copenhagen, Denmark** is home to leading companies and research and development opportunities in biomass, fuel cells, renewable energy, and energy storage. These companies are attracted to the city because of its access to electronic registries dating back decades, collaboration between the business, academia and public sectors, and reputation for possessing Europe's leading Smart Grid sector (Westberg n.d.).
- **Amsterdam, Netherlands** also has several impressive climate goals, including having completely emission-free road and water transport within the next ten years and becoming a circular city by 2050, or having everything the city produces and consumes be reusable. The city recently passed a sustainable recovery plan in response to the COVID-19 pandemic that includes six employment "generation engines" that cover renovation, heating, solar power, municipal property, and climate adaptation (City of Amsterdam n.d.). This plan sees green business as a source of economic recovery and therefore encourages green businesses to come to Amsterdam to revitalize the city's economy.
- **Vancouver, Canada** is another global leader in sustainability as a city with a thriving green economy that has been bolstered by strong city government incentive programs. Vancouver's Green & Digital Demonstration Program (GDDP) provides access to assets and infrastructure such as buildings, streets, vehicles, and digital infrastructure, for companies to use in product testing and showcase opportunities. The program also

provides critical follow-on connections and business expansion support through the Vancouver Economic Commission. Innovators who are seeking proof-of-concept trials or showcasing opportunities are encouraged to apply. GDDP currently has five completed projects, three ongoing, and another four in development. Another program in Vancouver, the Flats Climate Action Program, includes developing a Flats Fund to support innovative green businesses in the False Creek area of Vancouver (Vancouver Economic Commission n.d.). These programs have been successful in growing Vancouver's local cleantech industry.

Cities in the U.S. have also been increasingly implementing green business incentives.

- The **City of Los Angeles'** Green New Deal, or pLAN, includes goals of creating 300,000 green jobs by 2035 and increasing private sector green investment in the city by \$750 million by 2025. To do this, the plan aims to open green career pathways through multiple programs, one being offering Green Jobs courses at LA Trade Technical College for 250 students and placing them in internships. pLAN also includes creating an inclusive green economy in collaboration with the LA Cleantech Incubator (LACI) by helping applicants gain access to capital and other resources such as office space and executive coaching (Garcetti 2019). LACI is a city-sponsored incubator that works to accelerate the green economy by offering office space, consulting, and their own network of investors to companies that demonstrate a business model that advances sustainability (Make it in LA 2019). Additionally, the LA Industry Initiative aims to attract green industries to the city using tax incentives, low-cost loan and grant programs, and regulatory guidance (Garcetti 2019).
- In the **City of Sacramento**, the city government created a Green Capital Alliance, a partnership of people and organizations working to support the region's cleantech economy and promote sustainability (City of Sacramento n.d.).
- The **City of Long Beach, California**, as part of their proposed Climate Action and Adaptation Plan (CAAP), plans to develop partnerships with education, jobs, and workforce development entities to train and create jobs for residents that work towards reducing greenhouse gas emissions in building and energy use. CAAP also includes an intent to identify grant opportunities for potential funding of plans, studies, programs, or infrastructure investments that have great potential to mitigate and adapt to global warming while simultaneously incorporating environmental justice, equity, and investment in youth and the green economy (City of Long Beach 2020).
- Lastly, the **City of San Jose** has created the San Jose Environmental Innovation Center (EIC), which it describes as a "green enterprise" facility. The center offers services for residents and cleantech entrepreneurs and is home to Prospect Silicon Valley, a nonprofit cleantech innovation hub (City of San Jose n.d.).

All around the world, whether it be halfway across the globe or in the next county over, cities are implementing incentives to attract green tech and green businesses. Given other cities'

actions, it is imperative that Riverside implement their own incentives to remain competitive. Riverside has already demonstrated a commitment to sustainability and to becoming a greener city, but now it is time to show the rest of the world that Riverside is a strong choice for the front lines of green innovation.

ONGOING EFFORTS IN INLAND EMPIRE AND NEXT STEPS:

To incentivize green tech companies to come to Riverside, the City, the County, the Riverside Chamber of Commerce, the University of California Riverside (UCR), and the local community have joined forces to create and move forward a vision of what could be Riverside's prosperous future. Termed OASIS, the goal is to create economic vitality through sustainable technology innovation, development, and operations in Inland Southern California.

The relocation of CARB to Riverside; the research excellence that UCR has demonstrated in areas of sustainability, cleantech, agriculture, and health; and regional assets such as Ontario Airport, the ExCITE incubator, the Riverside Innovation District, and a technology focused Small Business Development Center constitute a unique opportunity for the Inland Empire to build out this vision with associated facilities and programs that will serve as a magnet for innovators and entrepreneurs to build and grow their enterprises in the Inland Empire.

As part of the OASIS effort, the city should institute a skills development program at Riverside City College to transition workers, especially those whose jobs are dependent on the fossil fuel industry, to jobs in green tech or at green businesses. Skills development programs have been found to be not only a draw for businesses, but also a cost-effective way to increase residents' earnings per capita. This effect on earnings is because 'skills beget skills.' Skills learned now lead to increased performance in education and training, that in turn results in better jobs that allow for further skills development. Community college workforce programs have been found to have a ratio of earnings benefits to costs of over 8-to-1 (Bartik 2019).

Riverside City College already has an environmental science program (Riverside City College n.d.), but a skills development program that targets fossil fuel workers looking to transition to the clean energy industry would require the creation of technical programs that focus on renewable energy such as solar and wind. LA Trade Technical College, a community college in LA, has technical programs such as Renewable Energy Generation, Transmission and Distribution - Powerline Mechanic, Renewable Energy Technician - Solar PV Installation and Maintenance, Renewable Energy Technician - Solar Thermal, and Renewable Energy with Energy Efficiency Emphasis (LA Trade Technical College n.d.). These kinds of technical programs could be replicated at Riverside City College.

This skills development program could be part of the proposed Inland Empire Technical Trade Center (IETTC) that is being planned by the Riverside Community College District (RCCD). The IETTC is the RCCD's response to the lack of technical training centers in the IE. Its goal is to increase the accessibility of high-demand, high-paying jobs. The program would provide not only education, but also pathways to jobs such as apprenticeships and other work-based

learning opportunities. Currently, the IETTC does not have a focus on sustainability. Potentially this program could be altered to include green technical training programs.

In addition to creating these programs, the City of Riverside should be an active supporter of the program being developed by CARB, UCR, RCCD and the Riverside County Office of Education (RCOE) that is creating pathways for students interested in careers in green tech. The Air Quality, Climate & Training (ACT) program is helping define career pathways with exit points at all levels from high school to PhD and will work towards engaging educators in conversations about needed emerging skillsets with employers from industry and regulatory agencies. Additionally, hands on learning and networking will be facilitated through partnerships with CARB and other industries such as Amazon, Kigt, Grid Alternatives, and Xtelligent where students will intern. The City and UCR's roll out of the attraction plan for OASIS will expand green tech industries for which additional customized job training programs can be developed as well.

The second action Riverside should take to make the city more attractive to green businesses is to create a center that provides resources for green businesses, especially startups, that move to the area. These resources could include connections, office space, and other infrastructure companies may need. This center could be modeled after LACI, an incubator sponsored by the LA city government, which focuses on unlocking innovation, transforming markets, and enhancing communities (LACI n.d.). LACI provides office space, introductions to investors, access to debt and investment funds, advisory sessions, mentorship, and public relations, legal, and government affairs support. In return, the organization takes a 1.5-3% equity stake in each company they incubate (Chandler 2021). LACI's website lists the City of LA and the LA Department of Water and Power (LADWP) as its founding partners (LACI n.d.). The organization was created by the LA Cleantech Alliance, a group founded by the Mayor's Office, the LADWP, Community Redevelopment Agency for LA, NASA Jet Propulsion Laboratory, UCLA, USC, CalTech, and Arts Center College of Design (SoCalTech 2011). Co-founder Fred Walti worked with the city to form Cleantech LA before founding the incubator (Vaillancourt 2011). LACI also has several institutional partners such as the U.S. Economic Development Administration, the CEC, the U.S. Department of Energy, and the State of California. Other partners include CARB and California Manufacturing Technology Consulting, as well as various private businesses and companies (LACI n.d.).

LACI is located in and oversees the La Kretz Innovation Campus, a LEED Platinum and WELL Gold certified 60,000 square foot campus in LA's Arts District. The campus was built to house LACI as well as the cleantech startups LACI sponsors. It features state-of-the-art green technology and hosts hundreds of sustainability and cleantech focused events (La Kretz Innovation Campus n.d.). Similarly, Riverside's green business resource center could be a part of OASIS, the city's own green campus.

LACI primarily focuses on startups, but Riverside's center could have programs both for startups and for green businesses that are already established elsewhere, but new to Riverside. This

center could be government-sponsored like LACI, or it could be implemented as an initiative of the Economic Development division of the Community & Economic Development Department of the city government. The kind of work a center like this would do would fit in with the Economic Development division's "Poised for Prosperity Roadmap" under the implementation principle of encouraging sustainability (City of Riverside n.d.). The center should focus on providing digital infrastructure, connections, and even capital assistance to green businesses. The center should also make its services available to green businesses already in Riverside to encourage their growth.

This green business resource center could take over from where the Western Riverside Council of Governments' (WRCOG) proposed EXPERIENCE left off. EXPERIENCE was an incubator proposed by WRCOG that was designed by Fred Walti, the founder of LACI. The project stalled due to conflicts between different interest groups involved, but its goal was to attract growth industries, further technological innovation, and increase Riverside's economic development. EXPERIENCE, like IETTC, was not emphasized as a green-focused incubator. The proposed green business resource center could build off the plans for EXPERIENCE by expanding to include services for existing green businesses as well as startups, and by being more sustainability focused.

As a part of the creation of this center and of OASIS, the City should designate the area of OASIS as a green innovation zone. A green innovation zone combines the principles of green zoning, such as incorporating green building requirements like LEED standards into a zoning code (Wolf 2011), with the principles of innovation zones or districts, geographic areas where institutions and companies cluster alongside and collaborate with start-ups, business incubators, and accelerators (Katz and Wagner n.d.). Any area given a green innovation zoning designation would be intended for green tech or green business industries only and would likely have requirements for green building standards. Zoning the area designated for OASIS in this way would ensure that the land is reserved for OASIS as the project's funding is acquired and would prevent it from being given to other uses or solicitations. In addition, zoning the land for green businesses only would make the land cheaper for businesses looking to establish themselves in Riverside because they would not have to face competition from other industries.

Similar hubs or innovation zones have been created in cities throughout the world. Near Cape Town, South Africa, the Atlantis Special Economic Zone (ASEZ) was created in 2018 and designated as a Special Greentech Economic Zone. The South African government has created various Special Economic Zones (SEZs) to help businesses benefit from scale and co-location. Incentives are provided to those businesses that choose to locate in ASEZ, including land purchase and lease arrangements for greenfield sites with environmental authorizations in place, a quick and transparent application process for business sites, fast-tracked development approvals and fee exemptions for land use and building plan applications, and a municipal electricity tariff subsidy, as well as various tax incentives (Green Cape n.d.).

In the U.S., many cities have designated innovation zones which, while not necessarily focused on sustainability, serve the same purposes of fostering growth and development. One of the most famous and earliest examples of this is Silicon Valley. Silicon Valley was not initially designated as an innovation zone, as the term had not been coined yet, but it functioned as one and still does today. Soon after WWII, Frederick Terman, an electrical engineering professor at Stanford actively promoted what he called a “community of technical scholars” in Palo Alto, which he described as a community composed of technology industries and a strong university “that is sensitive to the creative activities of the surrounding industry” (Saxenian 1983, p. 9). The aerospace and electronics enterprises that located in Santa Clara County after the war clustered around Stanford (Saxenian 1983) and created an innovation zone of sorts that was centered around the university. In the 1950s the Stanford Industrial Park was developed as one of the first of its kind in the country. Leases in the park were only granted to high-technology firms that were viewed as potentially beneficial to Stanford (Saxenian 1983). Stanford’s involvement in the development of Silicon Valley shows how beneficial it is to have a successful university collaborate and work in partnership with tech companies in an area. UCR is already involved with the planning of OASIS, and if the city could designate the area as a green innovation zone, the clustering effect of the university and green businesses would be that much stronger.

The City of Riverside is currently planning an Innovation District that was approved by the City Council in 2018. The zoning for the district is planned to be presented to the Council during Summer 2021. The area proposed for the district includes three square miles that span Downtown Riverside, portions of North Main Street, an underutilized industrial area north of Third Street by the intersection of the 91 and 60 freeways, and the Eastside community and portions of UCR. One of the Principles for Seizing Our Destiny presented in the plan for the Innovation District is “creating a strong, environmentally friendly, and innovative economy,” and the plan does include elements of sustainability such as creating green space and prioritizing non-polluting jobs and industries. Potentially the green innovation zone proposed here could be part of the Innovation District.

The implementation of a skills development program at RCC, the creation of a green business resource center, and the designation of a green innovation zone would help develop OASIS from a vision to a reality and create a green tech industry cluster in Riverside, which would provide a foundation for sustained competition between businesses. Regional clusters of related industries have been found to be beneficial in terms of job creation, increased incomes, export growth, and innovation. This is because clusters capture knowledge spillovers of technology, skills, and information. Innovation is strongest where high levels of interaction occur between businesses (Bekele and Jackson 2006). Creating a center that provides resources for green businesses would facilitate interaction between the businesses and create networking opportunities. The center and the skills development program would both be considered part of the cleantech industry cluster they would help create, as clusters include all regional

resources that exist to provide specialized training, information, and support (Bekele and Jackson 2006).

By taking these three actions, Riverside will be prepared to be the next center of green innovation. Instituting a skills development program at Riverside City College, establishing a center in conjunction with the OASIS partners and the Economic Development division that works to provide key resources to green businesses, and designating the area as a green innovation zone would further the city's goals of increasing the amount of green tech companies and green businesses in Riverside. In addition, these actions would support the growth of the city's existing green businesses. The city government should strongly consider implementing these actions to set Riverside on the path to a fully green economy.

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