

**CREATING GREEN JOBS IN COLUMBUS: IMPROVING OUR POSITION AND
LEARNING FROM OTHER CITIES**

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Introduction

One of the truly recurring political debates of the last thirty years has been the debate over whether or not economic growth and environmental sustainability can go hand in hand. Offshoots of this basic debate have included, but certainly have not been limited to, discussions regarding the merits of alternative energy policy, carbon emissions regulation, and mass public transit. In recent years, however, a new twist on this debate has been the ramping up of rhetoric surrounding the concept of “green jobs” and a policy strategy to promulgate the growth of these “green jobs.” The phrase has been loosely bandied about without formal, consistent definition, and has taken on varying degrees of importance within the larger debate over “going green.” What we propose to do with this report is to clarify and reframe the discussion over “green jobs” and its place in local and regional economic development initiatives. In an environment of growing awareness of and discussions of “green” initiatives, albeit at varying degrees, a relatively recent trend has been the growth of the idea of “green jobs.”

While there are countless definitions of that term, the basic idea is the same: a “green job” is a job involved in the production of a good or service that improves the environment and sustainability. With all due respect to all other worthy definitions, we will be moving forward with the Bureau of Labor Statistics’ two-part definition of a “green job” as follows: 1) a job in a business that produces goods or provides services that benefit the environment or conserve natural resources, and 2) a job in which workers’ duties involve making their establishment’s production processes more environmentally friendly or use fewer natural resources.

Methodology

Our report will be centered on the City of Columbus's potential for the perpetuation of a robust employment sector in "green jobs", and we will evaluate where Columbus is at, and where it needs to go, in order to make it happen. Our primary tool will be to compare and contrast initiatives in other cities around the United States similar to Columbus in terms of geographic and demographic size, industry profile, sprawl, etc. We will extract possibilities from these other cities for Columbus to adopt. We will also consider potential specific sectors of green job growth and relate them back and forth between our comparison cities and Columbus. A key to this analysis will be to differentiate "green" and sustainability initiatives, which are plentiful and well documented, from those that have tangibly created "green jobs", because often times the two do not go hand-in-hand. "Going green" does not always translate into "creating green jobs", and it is extremely important to understand this prior to delving into the depths of this project. We will compile a number of proposals for economic and regional planning officials to consider, forecast their respective feasibility and palatability among businesses and taxpayers, and make formal recommendations based on cost-benefit analyses. In particular, the cities we will be focusing on in addition to Columbus are Portland, OR, Denver, CO, Austin, TX, and Jacksonville, FL. We conclude that there is potential for Columbus to co-opt and adapt ideas from each city in the areas of retrofitting, public transportation, green building, and green energy development.

Academic Perspectives: A Summary of Professional Perspectives

Within the framework of the larger debate over the merits of environmentalism in public policy, the merits of "green jobs" are a hot button topic in politics today. There are well

documented views on this topic all across the political spectrum, ranging from support for the idea that job creation can be a consequence of “going green”, to ridicule of such ideas as fantasy and incompatible with economic reality. We support the view that a viable green employment sector is possible. It can provide respite for the working classes who have been set back by the loss of countless jobs in the manufacturing sector, in the form of new employment opportunities that demand the caliber of skilled labor that the once-great manufacturing sector of yesteryear demanded. Green jobs, according to Sarah White and Jason Walsh of the Center on Wisconsin Strategy (2008), cannot be outsourced because of the type of work they entail. Weatherizing buildings, erecting wind turbines, installing solar panels, and implementing smart grid technology must necessarily be completed locally, often in the communities that will benefit from these changes. Green jobs can offer workers upward mobility with respect to skills and responsibilities, giving them characteristics of a relatively lucrative trade or career pathway, essentially a “green ladder to prosperity” (White and Walsh, 2008) rather than a short-term or temporary arrangement. White and Walsh (2008) note that green industries have the ability to both create new jobs and save existing jobs by transferring those workers’ skills to an environmentally-friendly industry.

Not everyone is optimistic about the future of green jobs. Andrew P. Morriss et al. (2009) see green jobs supporters as using the term as a campaign buzzword and an excuse to implement centralized economic planning by telling “consumers and workers” which technologies to pursue. They state that green jobs will pay less and will be less desirable than the jobs in the fossil fuel industries. They also see the timeline and goal of transitioning to 100% renewable energy within 10 years, as proposed by Al Gore in January 2009, to be unrealistic. The reason

for their lack of faith in that goal is that “less than 10 percent of electricity in the U.S. comes from renewable sources” (Morris et al. 2009). They also question the necessity for investment in public transportation, arguing that it may not be an effective or feasible way to reduce automobile emissions in a sprawling city, especially when cars are becoming increasingly efficient (Morris et al. 2009). They believe that encouraging small-scale agriculture and ‘buying local’ would raise food prices, disproportionately punishing the poor while limiting the choices consumers have. They also maintain that the “assessments of potential” of green jobs are “unrealistic,” and that people should demand more evidence that there will be enough green jobs to replace the blue collar jobs we are losing before investing money in the initiative. They conclude that it would be safer to trust market forces rather than mandates with the future of our economy.

Robert Pollin of the Political Economy Research Institute of the University of Massachusetts Amherst (2009), in contrast, asserts that, although the paper by Morris et al. “offer[s] a few useful correctives . . . regarding the links between green investments and jobs,” they “offer no challenge to the central explanations as to how investing in the green economy will provide significant benefits.” Pollin’s article “Green Recovery” describes how investing the same amount of money in green industries creates roughly “three times” more jobs than spending the same amount on the fossil fuel industries (Pollin et al., 2008). Pollin acknowledges that the *average* pay for workers of green jobs is about “20 percent less than the average for those connected to the oil industry.” He responds to this claim by stating that this figure is “deceptive” because investing in green jobs will create three times the amount of jobs that pay more than “\$16 dollars an hour” and increase the number of entry-level jobs that offer opportunities for

advancement (2009). He continues, saying that only one program out of the many discussed in “Green Recovery” – a Cap and Trade program – calls for government mandates; the rest use tax incentives and loan guarantees. Pollin maintains that it is both possible and beneficial to grow the green economy in the U.S.

Four Sectors with Promise for Green Jobs

Retrofitting

White and Walsh (2008) state that the easiest and most cost-effective method for creating green jobs in the short term is in the improvement of “energy efficiency” through practices such as retrofitting, green building, and green manufacturing. The Center for American Progress recommends that all federal, state, and local public buildings undergo retrofitting. There are already federal grant programs in place that could assist with the funding of building retrofits at the local level (Pollin et al., 2008). In order to expand this initiative to residential homes, the Center for American Progress suggests strong financial incentives such as a tax credit for homeowners who enhance energy efficiency in their homes. Retrofitting initiatives would create jobs and increase demand for services from existing blue collar occupations such as carpenters, roofers, building inspectors, electricians, insulation workers, and construction managers (Pollin et al., 2008).

Mass Transit

Cities and metropolitan areas can simultaneously reduce automobile emissions and create green jobs by existing public transit services, streamlining them to maximize their availability where and when people need them the most, and adding new modes of transportation. Pollin et al. (2008) note that civil engineers, bus drivers, welders, electricians, dispatchers, and

locomotive engineers are among the occupations that would experience green job growth with new investment in transportation infrastructure. The benefits of robust public transit with respect to economic development in an entire city, particularly a downtown area, are well documented.

Smart Grid

Smart grids increase the efficiency of electrical energy distribution and generation. A successful smart grid project would involve state policies “such as decoupling electricity sales from profits” (Polin et al., 2008). The Center for American Progress lists machinists, construction laborers, operating engineers, computer software engineers, electrical engineers, tem assemblers, power line installers and repairers, and electrical equipment assemblers and technicians as some occupations that would experience green job growth with investment in the development of smart grids.

Alternative Energy: Wind Power, Solar Power, and Advanced Biofuels

Alternative energy, best exemplified by such sources as wind power, solar power, and biofuels such as ethanol and biodiesel, is another area where there lies untapped potential for green job growth as well as energy savings in the United States. White and Walsh (2008) note that wind power has potential for growth in “both urban and rural areas.” Pollin et al. (2008) state that we have not seen substantial growth in these areas due to “an unstable policy environment and the lack of long-term incentives.” Their recommendation is to use federal grants, loan guarantees, and tax incentives to bolster this upcoming industry. The Center for American Progress includes environmental, chemical, and electrical engineers, electricians, welders, industrial production managers, iron and steel workers, chemists, agricultural workers,

truck drivers, and agricultural inspectors among the occupations that stand to experience green job growth with direct investment in alternative energy production.

Sectoral Strategies for Creating Green Jobs

Recognizing that cities have the opportunity to lead the green jobs revolution, Joan Fitzgerald has outlined three strategies that cities can use to develop their green economy. First, a city can use a “transformational strategy” by adapting an existing industry to start producing a green product or providing a service that benefits the environment. Toledo, Ohio is one example of success in transforming a dying and ‘dirty’ industry into a thriving green one. Toledo has achieved success through the city’s plan to transform its glass industry infrastructure to manufacture solar panels (Fitzgerald, 2010). Toledo is now home to the nation’s largest thin-film solar panel manufacturer, employing more than 6,000 people in multiple companies (Fitzgerald, 2010). This industry has certainly revitalized Toledo, drawing in workers and businesses, and it continues to grow. In 2008, First Solar, a national leader in the production of solar panels founded in Toledo, announced its plan to expand its workforce of 700 by hiring an additional 134 employees. In 2009, Toledo announced the opening of Sphere Renewable Energy, a renewable energy company which will employ between 100 and 150 individuals once it reaches full production.

Following the influx of solar energy, new renewable energy industries have moved into the area. SuGiant Systems, a second renewable energy company created in Toledo and housed at the University of Toledo, is developing a process for producing ethanol from cellulosic waste materials including leaves, grass clippings and wood chips. Its pilot plant will employ approximately 25 individuals, but seeks to eventually create between 100 and 150 green jobs.

Fitzgerald (2010) credits the following policies for Toledo's success: "a university research program, an economic development organization focused on fostering start-ups, and several state government programs that provide for various types of assistance."

Cities that do not have a clear link between their existing industries and green industries can employ a "leapfrogging strategy" (Fitzgerald 2010). Leapfrogging, as the name suggests, involves a city's jump into a completely new type of green industry. These strategies carry a high degree of risk but have comparable potential for high rewards as well. Cleveland, Ohio, has adopted a "leapfrogging" strategy to propel success in its creation of a wind industry. In 2007, following the initial installation of wind-measuring equipment near Lake Erie which yielded promising results, the Cuyahoga Regional Energy Development Task Force established a plan to develop an off-shore wind cluster, the Great Lakes Wind Energy Center. The development of Cleveland's wind industry was further propelled by the adoption of legislation by the state government requiring that at least 25 percent of all electricity sold in the state of Ohio be from "advanced" sources by the year 2025 and requiring that the Ohio Public Utilities Commission develop rules for "decoupling" profits from sales. In 2006, "the wind industry accounted for \$250,000 million in revenue and 1,700 direct and indirect jobs in the state" (Fitzgerald, 2010). In 2008, Governor Strickland announced that the MTorres Group was considering building a wind turbine plant in Cleveland which would create a minimum of 200 green jobs, and expand to as many as 3,000 if it could support the broader U.S. market (Fitzgerald, 2010). Additionally, since 2007, more than 50 manufacturing companies in Cleveland have been identified as potential suppliers for wind turbine production, which would transform existing jobs into green jobs (Fitzgerald, 2010).

Finally, by connecting economic outcomes with environmental goals, cities can promote green businesses while improving the economic situation of their community. This can be done by targeting low-income populations for green job training programs or by making green housing renovations more affordable through financing options. Fitzgerald (2010) calls this a “linking strategy.” One prime example of a strategy linking economic development with environmental goals is found in Berkeley, California. In order to give homeowners an incentive to make an expensive installation of solar panels, the local government has instituted a system called the Berkeley Financing Initiative for Renewable Energy (Berkeley FIRST) where they finance the initial costs and homeowners repay them over time through installments on their property tax bills (Fitzgerald 2010). The energy savings and increased property taxes cancel each other out, making the change in the amount paid by homeowners virtually unnoticeable until the homeowners pay off the solar panels and they begin to realize the energy savings.

City Profiles

In this section, we will profile green job initiatives in four major cities as previously mentioned: Portland, Denver, Austin, and Jacksonville. By and large, the efforts in these cities are strategies that specifically link an increase in sustainability and environmental friendliness to a tangible positive impact on job creation, whether by generating demand for new occupations and utilizing job training, or by redirecting existing human and capital resources. In particular, the sectors we will focus on are retrofitting, transportation, alternative energy, and smart power grids.

Portland, OR

The city of Portland, Oregon is widely known to be a leader in green jobs. The Center for American Progress and the Huffington Post both named Portland one of the top 5 cities for

green job growth and availability in 2010. Portland is the most populous city in the state of Oregon with an estimated population of 582,130 in the city proper and approximately 2.2 million people in the metropolitan area. It has experienced recent population growth over the past 10 years by about +1.5%. With regard to industry, Portland has been nicknamed the “Silicon Forest” due to thriving high-tech industries, exemplified by Intel’s status as the city’s largest employer. Portland is also home to several corporate headquarters for sporting goods companies, namely Adidas, Columbia Sportswear, Nike, and Yakima Products. Mercer’s Quality of Living Survey ranked Portland 42nd worldwide for overall quality of life based on a variety of indicators including transportation, education, crime, and environment.

Retrofitting

Starting in June 2009, Portland instituted the \$2.5 million Clean Energy Works Portland (CEWP) initiative in order to create jobs while making the city more energy efficient.

Worksystems, Inc., a nonprofit public job-training system, is working in collaboration with the program to equip Portland’s citizens with the skills needed to help them start a successful career with the program. Worksystems, Inc. was founded in 1985 as a reaction to the city’s economic recession and continues to fund job-training efforts today. The CEWP guidelines as outlined in the policy brief, “Clean Energy Works Portland: A National Model for Energy-Efficiency Retrofits” by the Green for All organization (2010), state that employees should earn at least 180% of the state minimum wage of \$8.50 per hour, making the minimum wage for a CEWP employee \$15.30 per hour. In order to keep the benefits from CEWP in the local area, the “Portland Community Workforce Agreement calls for 80% of employees to be hired from Portland” (Green for All, 2010).

The process of establishing this program began with a 4-stage pilot project to retrofit 500 homes, which took place between the summer of 2009 and the autumn of 2010. At each stage of the project, stakeholders evaluated the program's progress to ensure it moved further ahead on the right track. By mid-2010, Portland moved on to a full-scale program with a goal of retrofitting 100,000 more homes throughout the duration of the project. The Institute for Sustainable Communities (2010) estimates that CEWP could create up to 10,000 jobs over the next few years.

In order to be considered for a retrofit, homeowners must fill out an online application. Then, building inspectors will evaluate applicants' homes and their potential for energy savings before making a determination as to whether or not it qualifies for retrofitting service. Retrofits can include attic insulation, wall and floor insulation, duct sealing, air sealing, upgrading the furnace/heat pump/hot water system, or any combination of these. Homeowners pay off the costs of retrofitting through a charge on their utility bills. Table 1 below, taken from the CEWP Policy Brief by Green for All (2010), details and describes the retrofitting packages available and the variable interest rates depending on the type of package and the income of the homeowner (or renter).

Table 1**Summary of retrofitting programs available in Portland**

Package	Eligible Measures	Rate	Term
Basic Weatherization	Attic insulation, air sealing, duct sealing	7%	20 years
Extended Weatherization	Above + wall and floor insulation	5%	20 years
Extended + space heat or hot water	Above + furnace/heat pump and/or hot water	3%	20 years
Near-low income (200-250% of Federal poverty level)	Any weatherization services	2%	20 years

The low interest rates as shown on Table 1 and gradual repayment of loans make this project feasible for homeowners, while the revolving loan system makes it sustainable for the city. The funding that has allowed CEWP to begin comes from a variety of sources including the American Recovery and Reinvestment Act and government bonds issued to investors.

According to CEWP's website, the average loan amount is \$11,931. ShoreBank, a "non-profit Community Development Financial Institution" will use capital from the city of Portland to establish the loan fund, paying contractors upon completion and inspection of each renovation. The Clean Energy Works Oregon website claims that homeowners pay an additional \$30-35 per month with their utility bills. The returns are difficult to quantify, because each home will realize different levels of energy savings, but Clean Energy Works Oregon claims that "95% of pilot

participants are so happy with their upgrades that they say they will recommend the program to a friend” (2011). At this point in the project, there is no set procedure for passing on the cost of the renovations when homeowners sell their homes, but the CEWP policy brief states that homeowners and buyers can negotiate that aspect on their own.

Infrastructure Investment: Dealing with Stormwater Runoff

In order to improve water quality, community livability, protect natural habitats, and reduce stormwater runoff, Portland implemented the Grey to Green Portland initiative. This 5-year, \$55 million project began on July 1, 2008 and involves a variety of labor intensive efforts. One component of the project is the facilitation of ecoroof installation. Ecoroofs are a covering of vegetation over a waterproof membrane that serve as insulation, capture air pollution, reduce levels of carbon dioxide, and create a habitat for native species. According to the City of Portland Environmental Services (2006), “An ecoroof can capture and retain 60% of the annual precipitation that falls on it.” So far, the project has facilitated the completion of 87 Ecoroofs. Buildings that have added Ecoroofs include the Portland Municipal Services Building, apartment complexes and condominiums, a community center, and privately owned homes. According to the City of Portland’s website, Ecoroofs can cost between \$5-20 per square foot.

The Ecoroof Incentive Program is funded by city grants and covers \$5 per square foot of the cost for approved projects. Homeowners and businesses can obtain an application to gain funding for their Ecoroof project online. This incentive program has helped increase demand for Ecoroofs, creating and sustaining jobs by supporting businesses that specialize in green roofs. Established roofing companies have also responded to new demand by beginning to offer Ecoroofs as an alternative to traditional roofing materials.

The city is also adding vegetated curb extensions, streetside planters, and infiltration basins to collect water runoff from the street. Another aspect involves planting trees in urban areas and removing invasive species and culverts. All of the above tasks are labor intensive. Funding for the Green Streets investment comes from a variety of sources, including BES contract savings, the Innovative Wet Weather Grant from the EPA, and the 1% for Green program, which requires that 1% of construction costs from city projects that are exempt from SWAA (Social Welfare Action Alliance) must be redirected to Green Streets. As of today, the city is just over halfway into the 5-year program and is on track to exceed its goals.

Transportation

Portland occupied the top spot in the U.S. News and World Report's (2011) "10 Best Cities for Public Transportation." Portland has earned this recognition by continuously updating and reevaluating its transportation system in order to provide the best service for its citizens. They use a 5-year rolling plan that is updated annually. Some current goals involve connecting regional centers by expanding high-capacity transit through investment in MAX Light Rail, Commuter Rail, and streetcar service. Their TriMet bus service aims to run at least every 15 minutes daily. Mass transit reduces the number of cars on the roads, making driving safer for everyone and reducing harmful emissions, and their upkeep, maintenance, and expansion is very labor intensive and requires the employment of a wide array of occupations all across the skill and education spectrum. Portland funds their transportation expansions with \$50 million in stimulus funds as well as existing payroll tax revenues.

Denver, CO

Denver, Colorado has also established a reputation for being a leader in green jobs. In 2009, the city was named the 6th best U.S. city for green jobs in a ranking by Clean Edge, an environmental research firm. Denver is the capital and most populous city in Colorado and has been consolidated with Denver County. The population of Denver is approximately 600,158 in the city proper and 2,552,195 in the metro area. The population has increased in the past 10 years by about +2.4%. Denver's location and size have influenced industry development in the city; it is about halfway between both Los Angeles and the Bay Area and the large Midwest cities of Chicago and St. Louis. Several companies are based in Denver, including Molson Coors Brewing Company, the gold producer Newmont Mining Corporation, Wright & McGill fishing gear producers, and Qwest, a telecommunications company. There are also multiple restaurant chains that began in Denver, including Chipotle Mexican Grill, Noodles & Company, Quizno's, and Qdoba Mexican Grill. Denver contains several colleges and universities, including the University of Denver, University of Colorado Denver, Johnson & Wales University, Regis University, Metropolitan State College of Denver, and the Community College of Denver.

Green Jobs Training

The Denver Green Jobs Initiative (DGJI) is a 2-year initiative to train 500 individuals that is still in progress today. According to DenverGreenJobs.org (2011), the training center offers programs in "Solar energy technology, green construction, energy efficiency and weatherization, green jobs administration and sales, OSHA 10 (Occupational Safety and Health Administration), and an apprenticeship with Frost Commercial Insulators." The program reports a rate of approximately 64% job placement. The program has a social justice aspect that it achieves by

targeting historically underserved populations such as minorities, veterans, women, offenders, and the homeless. The project's \$3,633,195 budget comes from the Department of Labor's Pathways out of Poverty Grant which was authorized by the American Recovery and Reinvestment Act. The program reports that "to date, over 800 participants have taken at least one class at DGJI" (DenverGreenJobs.org, 2011).

Denver's Transportation Investment

Denver has been incredibly successful in implementing and garnering support for transportation expansion programs. In June 1999, planning began for T-REX (short for Transportation Expansion). The goal of the project was to relieve the area's overcrowded freeways and introduce public transportation to a sprawling region by adding 6 new rail lines, 3 extensions, and a bus rapid transit system. The project came in below budget and 22 months ahead of schedule as it finished construction in December 2006. They were able to afford this \$1.67 billion expansion with donations and loans from businesses including the Denver Chamber of Commerce and an increase in property taxes that voters approved in 1999. Now, the city boasts 61,000 rider trips each weekday.

Since the success of T-REX, Denver is planning another investment in transportation called FasTracks. This project is based on transit-oriented development; city planners suggest mixed land uses within ½ mile of transit stops in order to bring activity to those areas. FasTracks includes "119 miles of new tracks, 70 new transit stations, 18 miles of bus rapid transit, 21,000 new parking spaces at light rail and bus stations, and expanded bus service in all areas" (RTD-FasTracks.com/main_26 2010). This \$6.5 billion dollar project is still in the process of getting off the starting blocks. In 2004, voters approved a 0.4% sales tax increase, and the project

received \$1.4 billion in federal funding, which will cover 1/5 of the total cost. This, along with local contributions, sales tax bonds, Transportation Infrastructure Finance and Innovation Act (TIFIA) loans, and partnerships with private companies, still has not covered the total cost of the program. They are currently trying to fill a \$2.45 billion funding gap by adopting a new financial plan.

Austin, TX

The city of Austin, Texas strives to be the most “livable” city in the country, and the goal of attaining such a title has fostered efforts to make Austin a “green” city, as well. Austin is very similar in population size, with a population of approximately 656,562 people, ranking it 15th in the nation (compared to Columbus’s 16th). A significant advantage Austin has is its location in Texas, a state that has been very prolific in its generation of green jobs growth and investment. According to a yearlong study by the Pew Charitable Trusts, the state of Texas ranked second as recently as 2007 for the creation of green jobs, and fourth in patents tied to clean energy. Seven percent of all green jobs created were in Texas. Furthermore, Texas attracted the third most venture capital investment in green energy among all states between 2006 and 2008. (Avalanche Journal). These favorable conditions for new investment and green job growth have no doubt helped Austin on its way to being a leader in green job creation.

Green Building

Among the many programs that Austin has successfully implemented to create green jobs, building programs have been the most popular and most effective. Austin’s building program evaluating the construction process for a building every step along the way, and ensure the integration of “green building” principles at each step. This comprehensive program, which

pertains to residential, commercial, and public buildings alike, was the first of its kind in the nation, and effectively rendered each and every construction occupation associated with an applicable project as a “green job.” This way of building was designed “...(to) emphasize(s) a team approach to building that includes all building professionals, from architects to craftspeople. The team approach to construction makes it easier to incorporate green building principles at every step of a project” (Austin Energy). It has pursued far reaching changes to city building codes and regulations to ensure compliance and successful greening of any new construction project that takes place in the city limits. This building program thus far has, and will continue to, severely reduce carbon dioxide emissions annually as well as create hundreds of green jobs in the city.

“Dillo Dirt”

Another very successful program in Austin in initiating green job growth is the innovative creation of a compost known as “Dillo Dirt.” Dillo Dirt is the first program of its kind, in which compost created by leftovers such as exec yard trimmings, along with trash, is collected from the curbs of Austin residents. In addition to the yard waste collected, the city uses treated sewage to create the Dillo Dirt. The sewage and yard trimmings are then combined together and then they’re both heated to generate the Dillo Dirt to be used; “The heat generated in composting (130 to 170 degrees Fahrenheit) is sufficient to virtually eliminate human and plant pathogens. After active composting for over a month, our compost is "cured" for several months, then screened to produce finished Dillo Dirt™ ” (City of Austin).

This recycled compost is most known for its use by residents in gardening and other yard applications, and its versatility is demonstrated by its approval by the EPA for unrestricted

use. More importantly, Dillo Dirt is also very effective in cutting landfill costs for residents as sewage and yard waste are constructively reused rather than piling up at a landfill. Dillo Dirt is a trademarked product of Austin's waste utility, and its widespread use has led to the creation of green jobs related to its manufacture.

This huge recycling program has recently been given \$6,949,800 by the Clean Water State Revolving loan funding that will be used to construct a 15 acre concrete pad to double the composting area where Dillo Dirt is produced. This expansion will call for more green jobs at every stage of process of creating the pad, from its initial building and implementation to its maintenance. The City of Austin estimates that 160 green jobs can be created as a result of this new project. This new composting pad and its improvements are geared to not only enhance on site solids handling capacity, but also decrease off-site land application and reduce approximately 30,000 gallons of diesel fuel consumption annually by 2012 while continuously employing green workers in the city.

Jacksonville, FL

Like Austin, the city of Jacksonville, Florida has been noted by Green Power Systems (a Florida based green energy company) as being a leader in green jobs in Jacksonville, Florida. Jacksonville's population is around 735,617 and is located just off the coast of the Atlantic Ocean. Jacksonville is known for being a huge tourist spot, given its warm weather and sunny appeal, the city is similarly known for its strides in energy efficiency and the creation of green jobs.

Job Retraining and Solar Energy

Jacksonville is unique in that its green job initiatives have begun targeting the unemployed, training them to work in “green” fields requiring skilled laborers. One particular example of this is the solar power industry. According to the Jacksonville Business Journal, their job training program was funded with \$387,000 in federal stimulus money provided by the American Recovery and Reinvestment Act of 2009 in order to train unemployed workers at a Community Rehabilitation Center. Those unemployed selected to be trained would learn how to install and maintain solar panels, providing them with a skilled trade that is proving to be very beneficial in the city, or any where there is any demand for solar panels.

A program that has helped create green jobs in Jacksonville in the solar power sector, as described by the Public Service Enterprise Group (PSEG), a local and regional leader in the effort to grow the green energy sector. and JEA (the city’s largest electric, sewage and water provider), is a low megawatt power plant that will be located in the city. The plant, known as a “solar farm”, will generate clean, dependable energy for JEA and facilitate further opportunities for the utilities to explore solar technologies. An estimated 100 direct, and 140 indirect, jobs will have been staffed thanks to this power plant (PSEG).

The concurrent growth of the green job training program that is producing graduates prepared to work on solar panels, and concerted efforts on the part of public utilities to move toward solar energies, is a big step towards leveraging the natural abundance of solar power in the state of Florida. As city councilman Reggie Brown put it, Florida “is the Sunshine State. What better place to lead the nation in solar power...”

Green Public Utilities

The aforementioned Green Power Systems company has been dedicated to using an electric generating facility which utilizes ultra high temperature plasma arc technology. The idea of a clean power program has been demonstrated in other sectors, especially with respect to solar energy. However, GPS's relatively new form of power generation uses a process known as Plasma Gas Vitrification (PGV), and has proven to be very beneficial both to the environment and to consumers. The process, which will be described in further detail, essentially diverts landfill waste and the gases they produce to electricity generation. With this technology, there is no ash residue, no toxic or leach-able product nor a need for landfills (GPS).

GPS states that "Water and air quality is vastly improved in comparison to incineration of fossil fuels. Hundreds of thousands of tons of waste materials can be diverted from landfill disposal to electric generation." They've been dedicated to the development of renewable energy projects as well as constantly reviewing current and emerging technologies in the field that can better their energy output and lessen their carbon footprint. The company insists the "... most effective and practical method of renewable energy is Ultra High Temperature (UHT) plasma gasification," a form of their energy output they use in Jacksonville.

The process of using a plasma arc is the key behind this clean conversion. UHT plasma gasification requires waste being put into a chamber where a plasma torch incinerates it at about 20,000 degrees Celsius (Safe Waste and Power). The waste separates into metals and non metals, the metal melts and is ultimately turned into a molten silicate that can be used and the remaining waste is tuned into a gas that is cleaned and used for fuel. This process is described by the Safe Waste and Power program as being clean because it breaks the materials down to their most

basic compounds (carbon dioxide, carbon monoxide, hydrogen, etc) and so any inorganic materials are melted and not used; “Ash and other inorganic material present in the fuel or waste is melted down to a complex liquid silicate that flows to the bottom of the reaction vessel.” (SWP). The idea of directly diverting landfill gas into a useful resource is remarkable. The JEA recognizes that these programs are not only hugely beneficial to the environment and to consumers, but they are labor intensive and their maintenance and upkeep has generated green jobs. The city of Jacksonville, The Trail Ridge Landfill, Waste Management and Landfill Energy Systems have partnered to begin a gas-to-energy project. According to LES, “This facility will benefit the local environment and economy, as it will offset the need for non-renewable resources such as coal, natural gas and oil. Our existing facilities and programs such as this one to expand renewable energy in the region demonstrate the company’s dedication to fulfilling the needs of the community.”

Summary of Cities and Initiatives

Table 2 below will summarize each of the above four cities’ efforts in the four sectoral strategies previously discussed. It will detail some of the key features of successful initiatives in each sector, and indicate whether or not Columbus has an initiative of its own in the given sector. It should be noted that Columbus has taken initiatives in each of the four sectors, which demonstrates awareness of these sectors and the associated economic opportunities from investing in them on the part of city leaders. There are significant opportunities to bridge the gap between Columbus and the other cities in each of these sectors by incorporating some of the key features of successful initiatives in each sector outlined below.

Table 2

Summary of initiatives in comparable cities

Key Strategies	Cities with Activity in Said Area	Key Elements of Successful Initiatives	Recent/ongoing initiatives in Columbus
Retrofitting	Portland, OR Denver, CO Austin, TX	<ul style="list-style-type: none"> • Financing options for homeowners • Job training program • Public and private buildings with potential for significant improvement in energy efficiency 	Yes. Stimulus block grants have been used to fund loan incentives for residential or business retrofits
Transportation Expansion	Portland, OR Denver, CO	<ul style="list-style-type: none"> • Reliable bus system with convenient stop locations • Alternative forms of rapid transit such as light rail • Infrastructure making the city bicycle- and pedestrian-friendly 	Yes. We are investing in the COTA system and adding bike lanes. There is interest in adding a commuter rail.
Alternative Energy: Wind, Solar, and Biofuels	Portland, OR Denver, CO Jacksonville, FL	<ul style="list-style-type: none"> • Uses whatever source of alternative energy is most abundant in the particular area • Manufacturing base to produce wind turbines/ solar panels locally • Training program for workers to install/construct equipment • Research on new, greener, more efficient forms of energy 	Yes. There are projects in wind, solar, fuel cells, and anaerobic digesters as sources of alternative energy.
Smart Grid	Portland, OR Denver, CO*	<ul style="list-style-type: none"> • Policy decoupling energy sales from profits • Smart Meters • Hybrid and electric vehicles • Renewable generators 	Yes. American Electric Power has started an \$150 million smart grid demonstration project which will affect 110,000 consumers (smartgrid.gov 2010).

The Way Forward

The preceding discussions and profiling of green job creation efforts in the various cities outlined above provide Columbus city and metropolitan-area public officials with a number of differing approaches to green job creation in different sectors of potential “green growth.” The fact that, as discussed earlier, these cities share many similarities with Columbus, albeit to varying degrees, should bring us to pay even closer to attention than otherwise, not only to inform and educate us as to what is going on, but to equip us with information to synthesize and come up with a parallel solution that is feasible with respect to the social, infrastructural, and economic realities. Thorough synthesis of the above-discussed green job growth programs enables us to chart a course forward for Columbus. This course can be broken down by areas of potential progress or growth. These include, but certainly are not limited to, existing building retrofitting, regional transit, green construction, and green energy.

Retrofitting

Where Columbus Is

Columbus is the 16th largest city in the United States as of 2009, and with a boom in construction in recent decades, is a city rich in opportunities to retrofit homes, government buildings, and places of business of all sizes. The economics of business growth in this sector are beyond our scope, but the sheer amount of buildings in the area allows us to logically conclude that a retrofitting campaign, if successful, would make significant headway into continued growth of green industry and commensurate employment opportunities in Columbus. The city was given a \$7,403,500 grant under the American Recovery and Reinvestment Act (“the stimulus”), of which \$1.1 million have been allocated towards the Business Energy Revolving

Loan Program, which in essence offers incentives to businesses renovating or moving to a new space, in the form of a loan that is to be used towards energy retrofitting. Another \$50,000 block grant will “retrofit 60 homes in the Columbus electric service territory” (Get Green Columbus). However, robust job growth stemming from labor intensive retrofitting initiatives have yet to materialize in the Columbus area.

Lessons from Portland

There remains immense potential for Columbus to grow a green industry and create jobs by studying Portland’s retrofitting program, discussed at length in that city’s profile. One mitigating factor, however, is the issue of financing. As discussed earlier, Portland used a combination of stimulus funds and municipal bond issues to fund their CEWP program, and its impact on job creation and the fostering of enterprise in green industries alongside the municipal commitment sets a great example to follow.

Bridging The Gap

Assuming that stimulus funds given to the city for the creation of green jobs have been disbursed in their entirety, Columbus will not see this money again, and will likely be on their own to raise funds, whether from public or private sources. Further differences in political climate between Columbus and Portland may compromise the feasibility of a purely or predominantly municipal effort, but a public private partnership (PPP) which pools public sector capital resources with private sector entrepreneurial know-how may work out similarly if not better, with the added incentive of potentially laying the seeds of genuine business development. The sheer amount of room for growth of retrofitting in Columbus, and the commensurate labor

that will be needed to fill that room even close to capacity, gives us an indication of the magnitude of new job creation that could be possible in a robust retrofitting initiative.

Transportation

Where Columbus Is

The issue of public transportation in Columbus has been an interesting one, as it has throughout the state of Ohio. There is no passenger rail in the area at present, and Columbus is one of only three of the nation's 15 largest metropolitan areas without passenger rail. We may already have the Central Ohio Transit Authority (COTA), whose signature metro area-wide bus service Ohio State students and lower income residents in particular must be quite familiar with, but the fact remains that the Columbus area, with its multitude of multi-lane county, state, US, and interstate highways is dominated by personal cars and the commuters who drive them. The traffic congestion on almost all noteworthy highways during rush hours, while relatively low for a metro area as populated as Columbus, is a testament to this. A citywide street car initiative has stalled due to issues surrounding the cost as well as the necessity for them, as the downtown and immediately surrounding areas are comprehensively served by COTA. In general, new investment in public mass transit is an interesting political quandary that has yet to be solved in our state, and thus public policymakers should proceed with caution. The first step is always the most cumbersome.

Lessons from Denver

However, Denver's TREX shows us the benefits of ultimately taking that first step, and the subsequent benefits to all commuters, whether they be drivers, commuters who favor mass transit, or those who utilize both in park-and-rides. Denver, like Columbus, has a vast metro area

of over 8,000 square miles. The story of how TREX, was funded and implemented, and how it mitigated the suburban sprawl characteristic of the area, is one worth investigating further in search of a parallel solution in Columbus. Denver was able to secure funding from both public and private sources, and the engagement of the business community in getting TREX off the ground, as well as the passage of a property tax increase, shows us the importance of the sales pitch to business and voters. The benefits are real and tangible, and the failure of any of Ohio's "3C" metropolises (Cleveland's RTA makes them somewhat of an exception) to make any noteworthy investments in comprehensive 21st century metropolitan mass transit has to be somewhat attributed to a failure on the part of those responsible for "pitching" it to taxpayers. It should be noted, however, that TREX was born in the late 1990s, when times were good for middle class Americans and the economy, and tax increases in the name of public investment were much more politically feasible.

Bridging The Gap

Due to political differences discussed above, Columbus's policymakers may wish to replicate T-REX, but on a significantly smaller scale and an incremental basis. This allows demands made on taxpayers to stay low, and for subsequent benefits to potentially increase taxpayer appetite for expansion, because there are noteworthy differences in the traffic climate of Denver and Columbus that have influenced the development (or lack thereof) of mass transit. Local research on traffic congestion in Denver's metro area concluded that peak hour vehicular traffic on the I-25/225 corridor, the city's main highway artery, exceeded maximum capacity, and forecasts of new downtown growth further added to the urgency for action to resolve highway congestion. The situation was bad enough that Denver metro residents twice approved property

tax increases to fund the implementation of the T-REX. Columbus's own congestion situation is not nearly as bad as Denver's was, as the INRIX National Traffic Scorecard rates Columbus 48th on their highway congestion rankings, versus 15th for Denver, so this will even further depress urgency among taxpayers and suburban residents for a large scale mass transit undertaking. Hence, a smaller scale effort is an ideal way to get the ball rolling. Further, new employment opportunities in the implementation, operation, maintenance, and administration of the system will only help its cause with taxpayers. As with RTA in Cuyahoga County, policy with respect to this issue will have to be dealt with at the county level. Most suburban development in the Columbus area is still in Franklin County, recent development of Delaware County notwithstanding, so it would be an ideal arena for the policy process on this front.

Green Building

Where Columbus Is

The area of green building is one where the city of Columbus has been very active under Mayor Coleman. The "Get Green Columbus" initiative has dedicated a significant amount of time and resources to "green business" and by extension, the new employment opportunities that come with it, and a big part of that has been the demonstration of a commitment to green building. Among other things, zoning codes have been revisited, green housing has been built, and plans have been made to build new city buildings in line with LEED certification. The Green Columbus Fund has been created with the specific purpose of incentivizing green building by businesses and non-profits, whether for new structures or for old site rehabilitation. Brownfield land acquisition has been made a focus of this fund's disbursement, so as to bring green business development to inner city areas.

Lessons from Austin

A smaller scale reform in the area of new construction in any sector, even in new construction that is carrying out sprawl, could be to encourage and collaborate with builders to adopt “green building” technical ideas, as Austin, TX has done. Austin’s program is not significantly different from Columbus’s, except that it has been much more well established, and tangible standards of green building pervade every step of the construction or renovation process, as opposed to simply aiming for green certifications such as LEED for the finished product.

Bridging the gap

This could be approached in a multi-faceted manner, by revisiting city and county land use and zoning regulations, building codes, and other regulations to require or incentivize the introduction of “green” building principles into any new structure that comes up. This allows Columbus city and regional planners to simultaneously constrain rampant sprawl-style development without having to completely change the game, so to speak. Municipal incentivizing of private developers who carry out sprawl styled development may be necessary to get the project off the ground, and demonstration of the benefits of a green structure as opposed to the status quo could potentially create demand for “green” residential and business real estate customers, leading to the most basic business response there is: movement by real estate developers to meet this demand. A robust and successful retrofitting initiative could pave the way for comprehensive green building programming, as businesspeople and homebuyers will want to recreate the environmental efficiency of a “retrofitted” structure in new buildings. Importantly, any employment associated with the construction of a green structure is by extension a green job, from the construction workers to site supervisors to white collar

management professionals. While Columbus can lead the way, it will take engagement of suburban municipalities to make the most impact in areas where most new construction will be happening, and as with transportation discussed above, a county-wide initiative will have to be the way to go.

Green Energy

Where Columbus Is

The State of Ohio has seen healthy growth in its “green energy” industry of late, as a recent Columbus Dispatch profile showcased startups all over the state that were in the business of manufacturing technologies for the generation of clean energy including but not limited to wind, solar, fuel cells, and anaerobic digesters for the generation of methane gas to run power generators. Columbus broke ground on a digester plant that will create about 1 megawatt of electricity annually from 40,000 tons of city waste. Nextech, one of the companies profiled in the Dispatch piece, is a startup in Lewis Center developing fuel cell technologies that have so much potential that they have received \$5.7 million from the state of Ohio to date. Fuel cells, in a nutshell, turn fuels such as natural gas or hydrogen into electric power and heat. Private sector growth in green energy in recent years have been remarkable. There remains potential for similar cutting edge progress to be made at a large scale, municipal level with respect to public utilities.

Lessons form Jacksonville

In the area of energy, Jacksonville’s program which has linked landfill disposal to electricity generation is a fantastic way to continue to provide quality electricity for a sprawling city and metro area. Their process, in essence, is not terribly different from the anaerobic

digester discussed above, which Columbus has already moved on. Jacksonville is the largest city in the continental United States by land area, and they are presumably as qualified to deal with urban sprawl as anyone. Being a city large in geographic size as well as population, much like Columbus, the linking of waste disposal and power generation has truly moved Jacksonville's public utilities into the 21st century, particularly in terms of environmental and process efficiency. Its large scale success throughout the Jacksonville area demonstrates that it is indeed possible to recreate in Columbus. It reduces harmful air emissions and improves water quality, without compromising the stable and affordable nature of utility rates we currently enjoy.

Bridging the Gap

The implementation, operation, and maintenance of a brand new utility program is a significant infrastructure undertaking, and will necessitate significant labor of a wide variety of skill and education levels, from those who work at power plants to the scientists who design power generation processes. Such a program seems politically feasible as the improvements to air and water, and the seeming lack of any discernible impact on utility costs. However, Jacksonville and Duval County are a consolidated city-county and thus do not have to grapple with competing municipality interests within county lines, so there lies a potential hurdle to adopting a program like this one. Barring any similar movement to consolidate city and county services, a collaborative effort between Columbus and suburban municipalities may be in order.

Increasing Political Feasibility

The political feasibility of each of the above possibilities varies, and is subject to change at any time and any magnitude, for any reason. One way for Columbus to improve the image of "green" initiatives, especially those that would create jobs, could be to engage private firms that

provide marketing and/or PR consultancy and services. A public private partnership could be fashioned with the goal of producing a “sales pitch” to area taxpayers, specifically detailing the costs to them should the city or county move forward with an effort to raise public funds to pay for any initiative, and the short, medium, and long-term benefits to them. Fiscal costs of specific programs, the magnitude of tax increases needed to fund them, and other relevant information for taxpayers will be crucial, but the importance of short and medium term benefit identification cannot be overstated. Also, the distinction between simply “going green” and “creating green jobs” is especially important, given that in an environment of expanded structural unemployment, proper emphasis on new employment opportunities stemming from particular initiatives could decisively boost taxpayer receptiveness to the idea(s) in question. A similar approach will be in order towards the business community. The case of Denver being able to secure a significant proportion of initial funding for TREX, for example, shows us that the business community does stand to benefit from green job creation initiatives, and the right “sales pitch” to them may well pave the way for PPP-based collaborations between the public and private sector to lead to the creation of the robust “green job” growth sectors that we seek.

Conclusion

In sum, cities like Austin, Denver, Jacksonville, and Portland have shown Columbus that “going green” can also lead to “green job” creation if the right sectors are targeted, the right mix of private and public sector involvement is engaged, and sincere job training and retraining investments are made, because the initiatives themselves are truly labor intensive in a wide variety of occupations. It also so happens that these cities’ similarities to Columbus demonstrate unfulfilled potential in the area for significant industry and job growth in areas such as

retrofitting, mass transit, green building, and even green public utilities. Mayor Coleman's administration has established its prowess in the creation and maintenance of a city that is friendly to businesses of all sizes and shapes. There is no reason to believe that genuine industry growth, and the new employment opportunities that come with it, cannot take on a "green" hue in coming years, and that Columbus, Franklin County, and surrounding municipalities cannot work together to aid and abet it. Their track record of business friendliness, and the subsequent growth of the area in recent decades, certainly suggests that with the right institutional focus, they can.

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