



BUILDING CLEAN ENERGY CAREERS IN KENTUCKY

Mountain Association for Community Economic Development

November 2010

by Kristin Tracz and Jason Bailey



ABOUT THIS REPORT

For 34 years, the Mountain Association for Community Economic Development (MACED) has worked to improve the quality of life in eastern Kentucky and Central Appalachia by creating economic opportunity, strengthening democracy and supporting the sustainable use of natural resources. MACED seeks to grow wealth for low-income people in challenged communities, raise their expectations of the possible and engage them in solving tough community problems. MACED employs three major strategies toward these goals—1) providing financial capital and expertise to individuals, businesses and communities, 2) conducting research and engaging in communications to support good public policy and 3) demonstrating effective community economic development efforts that make a difference. For more information, go to www.maced.org.

MACED produced this policy brief as part of the Working Poor Families Project, a national initiative focused on state workforce development policies involving: 1) education and skills training for adults; 2) economic development; and 3) income and work supports. The WFPF supports state nonprofit groups to engage in a two-part phased process that begins with an in-depth assessment of the economic conditions and state policies affecting working families and is followed by actions to strengthen those conditions and policies. The WFPF is funded by the Annie E. Casey Foundation, the Charles Stewart Mott Foundation, the Ford Foundation and the Joyce Foundation. Brandon Roberts + Associates manage the project.

EXECUTIVE SUMMARY

The energy sector is on the path to a gradual but dramatic transition that presents both challenges and opportunities for Kentucky. The state's historic reliance on coal means new risks as the price of coal-fired power rises and cleaner forms of energy are increasingly adopted. At the same time, a number of new studies suggest economic opportunities for Kentucky in the growth of energy efficiency and renewable energy. Mitigating our risks and taking advantage of new opportunities necessitate taking a careful and comprehensive approach to our energy and economic future.

This report takes a closer look at the job opportunities in the clean energy transition for Kentucky and focuses in on the role of workforce development as part of an overall approach. A workforce development strategy is critical to providing workers with the skills needed for jobs in energy efficiency and renewable energy, and for assuring those jobs are family-sustaining and accessible to low-income Kentuckians. Along the way, the report highlights the necessary role of stronger state energy policy in spurring job growth and sustaining job opportunities. Job training is effective only if aligned with a deliberate job creation effort.

Kentucky possesses opportunities in the clean energy economy for three primary reasons:

1. Kentucky's energy efficiency gap creates opportunities to save money on electricity bills while creating jobs in the labor-intensive construction and retrofit sectors.
2. Kentucky's manufacturing base creates opportunities for job retention and creation in a transition to renewable energy component part and system manufacturing.
3. Kentucky's natural landscape and conditions present opportunities for job creation in renewable energy production.

Workforce development is critical to capitalizing on these opportunities because much of the job potential is in "middle-skill jobs": those that require more than a high school diploma but less than a four-year degree. Workforce development and worker support policies can align training to the skill needs of growing sectors; create career pathways for workers; expand access to that training and the resulting jobs for low-income workers and communities; and ensure that the jobs created are good quality and provide family supporting incomes.

The American Recovery and Reinvestment Act provided additional federal resources to create new clean energy jobs and expand Kentucky's worker training efforts in this sector. The state has taken important steps forward in the last few years in establishing certification systems, developing new curriculum, communicating across agencies and beginning to make sense of this growing field.

Institutionalizing such efforts—and sustaining and growing those jobs—will require substantive policy actions. Kentucky currently lacks an adequate energy policy framework to develop the market for renewable energy and energy efficiency. To maximize its potential, Kentucky should join a growing number of states in establishing a portfolio standard for renewable energy generation and energy efficiency savings, as well as expanding financing elements that spur investment in energy efficiency and renewable energy among energy developers, businesses, institutions and homeowners.

A workforce development strategy that is aligned with those energy policy changes would streamline the government interface with the clean energy economy through the creation of a single umbrella entity; strengthen mapping of job opportunities and career pathways in this sector; and increase access to new jobs for low-income Kentuckians through policies that increase the affordability of training and provide a bridge to new training opportunities for lower-skilled adults.

A changing energy landscape creates a challenging conversation in Kentucky. But with early planning and sound action, the way forward can mean new economic opportunities for working Kentuckians across the Commonwealth.

INTRODUCTION

The Great Recession has not spared Kentucky—dramatic job losses have been especially high in the construction and manufacturing sectors due to the decline of the housing market and the sharp drop in consumer demand. Of the 101,000 jobs lost in Kentucky since the recession began, 40,000 are in manufacturing and nearly 19,000 in construction. Just since December 2007, the state has lost 16 percent of its manufacturing jobs and 23 percent of its construction employment.¹ This impact is especially devastating for Kentucky’s working families, who have relied heavily on factory and construction work to provide decent, family sustaining incomes. Even as the economy recovers, serious questions persist about the viability of these two sectors—some fear that the housing market will take a long time to unravel from the bubble of the last decade, and that when manufacturing jobs do rebound they will do so outside Kentucky.

While federal action is needed to bring the national economy back to life in the short-term, state-level action is critical to re-building an economy that provides job opportunities for working families in the long run. A growing number of studies suggest that clean energy is critical for creating opportunities in sectors like manufacturing and construction, and that state policy has a critical role to play in making those opportunities real. Over the last ten years, many states have made dramatic shifts in policy to advance clean energy development. That action is motivated by concern about cleaner energy sources and climate change, but also by the economic opportunities that are presented by an energy transition.

A recent report noted that the U.S. market for solar panels, wind turbines, fuel cells, combined heat and power systems, and biomass engines is projected to reach \$226 million a year by 2016.² An analysis by the Renewable Energy Policy Project suggests that if the U.S. produced 25 percent of its electricity from renewable sources (compared to seven percent in 2008), the country could create over one million jobs alone in manufacturing and an additional 2.5 million jobs in related industries.³ This represents tremendous job creation possibilities throughout the country, and with the right policies in place, for Kentucky. Furthermore, a study by the Center for American Progress found that retrofitting 40 percent of the residential and commercial building stock in the United States would create 625,000 sustained jobs over a decade and result in \$64 billion a year in savings on energy bills.⁴ Such savings, in conjunction with the creation of jobs, could contribute significantly to meaningful economic growth.

Despite the promise of this emerging sector, Kentucky’s history and economy mean significant risks and challenges are

inherent to an energy transition. Although coal employment has declined dramatically in Kentucky over the years—and now makes up only one percent of statewide employment—approximately 17,000 Kentuckians still work as coal miners.⁵ Coalfield communities in eastern and western Kentucky have not yet been able to diversify their economies adequately beyond coal. Several studies suggest continued decline in the Kentucky coal industry due to diminishing resources, increasingly competitive energy alternatives and shifts in public policy—which will mean ongoing challenges for those workers and communities that shed these jobs.⁶

The state’s dependence on coal for over 90 percent of its electricity presents another barrier to capitalizing on the clean energy sector’s opportunities.⁷ Although the state has historically relied on low-cost, coal-fired electricity to keep consumer costs low and attract industry, the average price of that electricity is up 43 percent in Kentucky just over the last five years.⁸ These costs are rising for a number of reasons, including new capital costs associated with aging coal-fired power plants, higher coal prices and the phasing in of health and environmental regulations associated with coal. At the

“...the U.S. market for solar panels, wind turbines, fuel cells, combined heat and power systems, and biomass engines is projected to reach \$226 million a year by 2016.”

same time opportunities in cleaner forms of energy emerge, the economic advantages of Kentucky's dependence on coal are in decline.

Rather than putting Kentucky on the defensive, this reality should increase Kentucky's urgency to mitigate its risks and take advantage of the new opportunities to drive economic development and innovation. A comprehensive approach to energy policy is essential to capitalize on clean energy opportunities and the leading states' experiences highlight the crucial role workforce development strategy plays in beginning a successful clean energy economy transition. Kentucky will not be able to harness these new opportunities without a properly skilled workforce, and many Kentucky workers—particularly those with lower skill bases—will miss out without an intentional strategy to match training and educational supports with emerging employment needs.

The passage of the American Reinvestment and Recovery Act in February 2009 created new short-term demands and resources for Kentucky to expand investment in clean energy economy workforce development and job creation efforts. While many of these efforts are still being implemented,

Recovery Act-funded programs are critical to setting up the foundational systems needed as Kentucky's clean energy sector continues to grow. Kentucky's ability to provide relevant training, to ensure access to such training opportunities for low-income workers and to leverage the initial investment of the limited Recovery Act funding into long-term quality jobs depends heavily on the approach decision-makers take right now. This is a critical time for Kentucky to make the decisions that set us on the right path far into the future.

To inform such decision-making, this report first broadly reviews the economic opportunities for Kentucky in the areas of energy efficiency and renewable energy. It then briefly touches on the energy policy changes Kentucky needs to ensure a stable and growing job market in this area and includes a review of recent policy advances in the state. It then reviews the work Kentucky has undertaken through the Recovery Act to begin setting up systems for training and certification in this sector. The report concludes with a set of recommendations in the area of workforce development needed as part of an overall, long-term strategy for clean energy development.



MODEL STATE PROGRAMS: **OHIO**

Ohio has made progress towards balancing aggressive energy policies with crucial educational and training support infrastructure. Ohio passed a Renewable Portfolio Standard with bi-partisan support that requires utility companies to provide 12.5 percent of electricity from renewable sources while meeting a 22 percent efficiency target by 2025. Building on this policy driver for opportunities in the clean energy economy, two important partnerships have sought to align economic and workforce development goals with energy policy drivers: the Ohio Skills Bank is a partnership supported by the Board of Regents, the Department of Development, the Department of Job and Family Services, the state's Workforce Investment Boards and the one-stop partners that seek to ensure Ohio's workforce is prepared to meet the needs of the 21st century economy. The Skills Bank continues to assess opportunities that are or may be available in the clean energy sector and ensure that training materials provide skills needed for Ohioans to capitalize on these green job openings.

The Green Pathways Advisory Council is a multi-stakeholder approach that draws from public, nonprofit and private sector expertise. The Council aids in the statewide effort to understand the nature of green workforce demand and to reduce barriers to connecting workers and emerging employment opportunities. Convened by the Ohio Board of Regents, the Green Pathways Advisory Council encourages communication between and among diverse stakeholders to maximize the effectiveness of Ohio's economic and workforce development efforts.

CLEAN ENERGY JOB POTENTIAL IN KENTUCKY

While public attention in Kentucky focuses on the importance of coal to the state economy, clean energy jobs have been quietly growing, and studies of the economic potential of a national energy transition point to opportunities in the state. A Pew Charitable Trusts analysis shows a Kentucky jobs growth rate of 3.6 percent for all jobs between 1998 and 2007, but a growth rate of 10 percent for jobs in the clean energy economy sector during the same period.⁹ These jobs include a variety of skill levels, both blue- and white-collar positions, ranging from scientists to machinists. In additional analysis, the Center for American Progress projects a net gain of 25,705 jobs in Kentucky from a \$150 billion shift from fossil fuels to clean-energy investments—even after taking into account job losses in the coal and fossil-fuel related industry.¹⁰ It is important to distinguish, however, that this net gain of new employment opportunities is not guaranteed to replace existing jobs in the same geographic locations. Intentional policy efforts will be required to ensure that the benefits of such a transition to a clean energy economy accrue fairly throughout the state, leaving no region behind.

Kentucky possesses opportunities in the clean energy economy for three primary reasons.

1 Kentucky's energy efficiency gap creates opportunities to save money on electricity bills while creating jobs in the labor-intensive construction and retrofit sectors.

In a recent study *Energy Efficiency in the South*, conducted in partnership with Duke University and the Georgia Institute of Technology, the Southeast Energy Efficiency Alliance (SEEA) estimated cost savings and economic gains from efficiency measures on a state-by-state basis.¹¹ For Kentucky, SEEA found a “higher-than-average level of energy intensity” defined as consuming “more energy per dollar of economic activity than most other states.”¹² This intensity creates an opportunity to improve efficiency, and extract economic value from doing so. The report suggests that if Kentucky implements aggressive energy efficiency policies, the state could reduce its energy consumption by 12 percent of the energy consumed in 2007, resulting in an energy consumption rate of below 2010 levels by 2030.¹³ This is equivalent to avoiding the need for six 500-MW power plants in 2030.¹⁴ According to the SEEA report, tremendous cost savings potential lies in the residential and commercial sectors yielding an average household savings of \$240 annually and an average retail establishment savings of \$18,000 per year.¹⁵

The state stands to benefit significantly in terms of cost savings, but major gains from implementing efficiency policies can be had in terms of direct job creation as well. The SEEA

report calculates, adjusting for state-specific employment factors, that “Kentucky would experience a net gain of 10,600 jobs in 2020, growing to 14,300 in 2030.”¹⁶ These numbers are compelling especially in contrast to the Bureau of Labor Statistics estimate of 219,700 unemployed Kentuckians (10.5 percent unemployment) at the end of 2009.¹⁷

Significant research has been conducted benchmarking states’ performance and recommending areas of improvement; Kentucky is routinely identified as a state with significant gains to be made. The Rocky Mountain Institute (RMI) carried out a nationwide study of the country’s potential energy efficiency resources by examining opportunities at the state level.¹⁸ RMI found that Kentucky ranks 49th in electric productivity with spending at \$2.25 of gross domestic product per kilowatt-hour consumed (\$GDP/kWh).¹⁹ Electric productivity is a measure of how efficiently a state uses electricity. By comparison, for the same period the population-weighted national average electric productivity was \$3.76GDP/kWh and the average of the ten leading states was \$6.10 GDP/kWh. Kentucky is below average, and well below leading states, in generating economic activity from electric consumption suggesting room for significant efficiency improvement and economic growth.

The American Council for an Energy Efficient Economy (ACEEE) ranked Kentucky 36th of 50 states, earning 10.5 out of 50 possible points, in their 2010 State Energy Efficiency Scorecard on the basis of six categories that cumulatively measure a state’s commitment to energy efficiency.²⁰ This

ranking was a three place drop from the 2009 Scorecard. The report notes that Kentucky spends only \$3.99 per capita for energy efficiency programs, resulting in annual electricity savings that are only 0.02 percent of the state's electricity sales; leading states are now saving over one percent a year, or over 50 times what Kentucky is achieving.²¹ In-state evaluations of efficiency potential also support the significant role efficiency can play in Kentucky. A study commissioned by the Kentucky Governor's Office of Energy Policy carried out by the Kentucky Pollution Prevention Center (KPPC) found that "improved efficiency could meet all of the growth in energy demand predicted by 2017."²²

A significant portion of this efficiency potential lies in the industrial sector, which is promising for Kentucky since industrial consumption of energy leads Kentucky's demand. KPPC's "minimally aggressive" scenario calculates industrial efficiency improvements as making up \$3 billion of a total \$3.7 billion in statewide savings potential (208 trillion Btus industrial demand avoided out of a total 245 trillion Btu savings potential).²³ One technology that looks especially promising to realize industrial savings is combined heat and power processes (CHP), where waste heat generated as a byproduct of electricity generation is channeled and used productively as thermal energy. Traditionally low electric rates have been a deterrent to many installations of CHP systems to date in Kentucky; however, as rates continue to rise the upfront costs of installing such systems may prove to be more cost-effective than previously understood.²⁴ That these industrial efficiency opportunities have not been realized yet is a contributing factor to Kentucky's low ranking on the ACEEE State Scorecard.

This efficiency potential is real across all of Kentucky's utility customer classes. It means significant direct job opportunities in the construction sector for energy efficiency upgrades, in addition to the indirect job creation that will come when homeowners and businesses spend future energy bill savings in the larger economy. Most of the immediate construction-related employment opportunities will occur in existing homes and buildings. Retrofitting existing buildings, as opposed to building new structures, has traditionally proven more labor-intensive than average new construction projects. Some recent studies show that eight percent to 17 percent more jobs are created by this 'fix-it-first' approach than investments in new construction.²⁵ These jobs could be made available to Kentuckians with existing skills in the construction trades, as well as to new entrants looking to build a skill base and access employment opportunities.

2 Kentucky's manufacturing base creates opportunities for job retention and creation in a transition to renewable energy component part and system production.

Like the rest of the country, manufacturing has been in decline in the state.²⁶ Between 2000 and 2009, manufacturing employment declined 31 percent and now provides about 13 percent of Kentucky jobs. However, manufacturing remains an important asset and advantage for Kentucky. The state has a greater share of employment in manufacturing than the U.S. average, and is the third-largest auto-producing state in the country. Those manufacturing jobs are better-paying than average Kentucky employment. The average weekly wage

“ Research from the Renewable Energy Policy Project indicates that between 70 and 80 percent of the new jobs in the wind and solar industries will be in the manufacturing sector. ”

in Kentucky, as calculated by the Department for Workforce Investment using 2007 data, was \$694.30. For the same time period, the average weekly wage in the manufacturing sector was \$901.50.²⁷ The job losses in manufacturing suggest the state has a workforce both capable of carrying out manufacturing work and not actively employed doing so, making expanded clean energy opportunities—like in the areas of advanced battery manufacturing and renewable energy component parts—especially attractive. Kentucky's policymakers should be thinking hard about what can be done to retain existing manufacturing jobs, convert the existing manufacturing base to new markets and attract new employers to put Kentuckians back to work.

Manufacturing provides a big share of the jobs in the new clean energy sector. Research from the Renewable Energy Policy Project indicates that between 70 and 80 percent of the new jobs in the wind and solar industries will be in the manufacturing sector.²⁸ Employment in wind manufacturing has grown significantly from 2,500 jobs in 2004 to 18,500 in 2009.²⁹ Policies, including state-level Renewable Portfolio Standards and federal tax support, supported this growth and allowed manufacturing facilities to ramp up domestic production of component parts. In early 2005, domestic content (by value) in wind turbines approached 25 percent; in 2009, over 10,000 MW of wind capacity was installed and domestic content had grown to nearly 50 percent.³⁰ With

policies securely in place, manufacturers are able to make the long-term commitment to production facilities that generate meaningful jobs. Changes to manufacturing are under way. Recently, GE's Appliances and Lighting plant in Louisville expanded production facilities to meet increased demand for hybrid electric water heaters, smart washing machines and dryers adding 830 jobs and attracting recognition from Vice President Biden.³¹

3 Kentucky's natural landscape and conditions present opportunities for job creation in renewable energy production.

While Kentucky is often said to have little potential for renewable energy production, newer data and advancing technologies are changing our understanding of that reality. Kentucky's own renewable energy resources potential provide compelling opportunities for development in the state, in the areas of wind, solar, biomass and hydropower in particular.³² The Executive Task Force on Biomass and Biofuels Development in Kentucky concluded that 25 million tons of biomass per year is feasible, provided improvements in technology and yield continue on pace.³³ Sustainability concerns and best management practices still need to be agreed upon, but general consensus holds that Kentucky has significant biomass resources. While solar energy potential is often disregarded, Kentucky has greater solar resources than New Jersey; New Jersey has become one of the largest state markets for photovoltaics (PV) and was second only to California in PV installations during the first half of 2010.³⁴ Kentucky's solar resources are also significantly more promising than those of Germany, yet Germany continues to be a world leader in solar PV installations.³⁵ Additionally,

recent studies that take an expanded view of wind potential (measuring at heights of 80 meters and 100 meters in addition to previous studies at 50 meters) show that Kentucky has a higher potential for wind generation than previously understood.³⁶

As technology improves, the estimates for potential for in-state renewable energy generation tend to increase. However, Kentucky's job-creation potential does not end there. Significant job creation is likely to come in the form of installation and repair work as well, creating opportunities for machinists, technicians, welders, electricians, boilermakers and workers with related skills required to install and maintain renewable energy technologies. As explained previously, expanded in-state renewable energy production and installation may attract additional manufacturing operations—and thus create or retain additional jobs—as companies seek to produce parts in areas where the growth of an in-state market for renewable technologies is possible.

While pursuing a clean energy economy allows Kentucky to embrace emerging opportunities, it also allows Kentucky to mitigate its risks. An aggressive economic development, workforce development and clean energy approach could help address the decline of coal and fossil-fuel related jobs—including in coal-producing communities. A coordinated effort could help Kentucky prepare for the impact of rising electricity prices, as well as help stem the loss of manufacturing jobs through increases in industrial energy efficiency and conversion to renewable energy component manufacturing. Kentucky is vulnerable, and faces real challenges. But managing the extent of those future challenges depends in large part on what we do today.



MODEL STATE PROGRAMS: WISCONSIN

An element of Wisconsin's green jobs effort that sets it apart from other states is the collaboration with labor organizations to connect workers, particularly low-income or unemployed women and people of color, with good jobs and skill building opportunities. The program, known as the Wisconsin Regional Training Partnership /Building Industry Group Skilled Trades Employment Partnership also facilitates a connection between local employers and the trained workers they seek.³⁷ The Partnership's Center of Excellence offers an entry-level construction certificate in weatherization, in addition to basic skills and training, pre-apprenticeship tutoring and connections to community organizations that provide services like daycare, transportation and GED assistance.

THE ROLE AND IMPORTANCE OF WORKFORCE DEVELOPMENT

A recent report identified that “fully 55 percent of all new jobs in the emerging renewable energy and energy efficiency industries are projected to be in the manufacturing and construction sectors, industry areas that have long been the ticket into the middle class for the 68 percent of working Americans without four-year college degrees.”³⁸ Most of those new jobs will be so-called middle-skill jobs—those that require more than a high school diploma but less than a four-year degree, as well as some element of specialized skill training. In the construction and manufacturing sectors, that means trades such as mechanics, technicians and electricians will have the potential to contribute to the clean energy sector. Indeed, a recent study shows that 80 percent of the job needs in Kentucky in 2016 will require at least two years of post-high school training, putting the bulk of future jobs in the middle skill category.³⁹

Recent data suggest a serious workforce development challenge—both in Kentucky and the rest of the country—is helping low-income, low-skilled workers obtain the training needed to qualify for those middle-skills jobs. In 2007, about 56 percent of Kentucky’s job demand was in middle-skill occupations, but only an estimated 44 percent of the state’s workers had adequate training for those jobs. By contrast, 19 percent of jobs in the state were low-skill, but low-skill workers made up 28 percent of the workforce.⁴⁰ This indicates a skills gap that is poised to increase without training interventions as additional middle-skill jobs become available. A Census Bureau report shows that Kentucky is now tied for second highest percentage of persons below the poverty level nationwide.⁴¹ The provision of training in conjunction with economic development and clean energy policies has the potential to play a role in addressing that problem by providing new career-oriented opportunities accessible to low-income Kentuckians.

To address these issues, successful workforce development and worker support policies are critical to: 1) providing the kinds of training needed for growing sectors; 2) designing training

One critical area where Kentucky has received national recognition is for its piloting of a long-term, career-oriented approach to community and technical education, particularly in the health care sector.

so that it creates career pathways for workers—opportunities to continually advance to better job opportunities; 3) creating access to that training and the resulting jobs for low-income workers and communities; and 4) ensuring that the jobs created in the sector are good quality, family supporting jobs.

Kentucky’s approach to workforce development in this sector will and should rely heavily on the existing workforce system. Many existing and emerging opportunities in the clean energy sector are not entirely new jobs, but are modifications of existing work. For that reason, the Kentucky Community and Technical College System (KCTCS), the Area Technology Center system, the Workforce Investment Act infrastructure, and other job training and worker support efforts are central.

Kentucky has taken notable leadership in aspects of its workforce system that lend itself well to successful work in this sector. One critical area where Kentucky has received national recognition is for its piloting of a long-term, career-oriented approach to community and technical education, particularly in the health care sector. KCTCS has designed a system-wide initiative, Career Pathways, seeking “to link academic credits and credentials with a seamless system of career exploration and preparation, and skill upgrades, and to provide multiple entry and exit points spanning secondary, postsecondary, adult and workplace education.”⁴² By linking worker skills not only to employment but also to long-term paths to jobs of increasing quality in growing sectors, Career Pathways has shown success in increasing educational attainment and worker success. This focus on long-term work should be a critical part of a clean energy workforce approach for Kentucky. An emphasis on a pathways approach will help avoid a focus on the immediacy

of job creation at the expense of long-term, career-oriented opportunities for Kentucky workers.

The building trades have a significant role to play in the clean energy economy. As such, the existing apprenticeship system is critical. Kentucky recognizes voluntary training and career development efforts through registered apprenticeship programs covering 106 occupations throughout the Commonwealth. The Kentucky Labor Cabinet has developed a registration process, in accordance with federal and state laws, to ensure that apprentice programs include a minimum of 144 hours of classroom instruction per year, including theoretical and technical instruction, in addition to on-the-job training. Participants must also earn at least 2,000 hours of work experience through the apprenticeship program.⁴³ Such structured approaches to training and preparation of skills helps workers access better paying opportunities throughout their careers.

While not all registered apprentice programs are associated with formal labor organizations, several of the Commonwealth's most active are affiliated with internationally

recognized unions—including the local organizations of the International Brotherhood of Electrical Workers, the United Brotherhood of Carpenters and the Laborers International Union of North America Kentucky. Training opportunities available at these and many other labor organizations supplement the courses available through state educational channels.

In the report *Investing in Kentucky's Working Families: A Path to Shared Prosperity in the Commonwealth*, MACED provided an overview of the status and issues related to the state's system of training and other supports for low-income working families. The report noted that the state has had notable success in a number of areas, including Career Pathways and Ready to Work, an effort to help Temporary Assistance to Needy Families (TANF) recipients access higher education and work opportunities through support services at community colleges. But the report also noted that too much of the overall system remains fragmented, underfunded, difficult for low-income families to access and focused on short-term results only. These issues are relevant for efforts to employ Kentuckians in the clean energy sector as well.



MODEL STATE PROGRAMS: **WASHINGTON**

Washington has passed a number of essential pieces of legislation aimed at promoting the state's clean energy goals, which have a cumulative impact on workforce development and job creation opportunities. Among the notable legislative acts that have led to a culture of energy-focused green jobs is the 1977 Washington State Energy Code—enhanced repeatedly since its initial passage—which sets the standards for energy efficiency for newly constructed buildings.⁴⁴ Additionally, Washington State voters have expressed support in the form of Ballot Initiative 937 (2006), creating targets for new construction and installation of renewable energy facilities over and above the Renewable Portfolio Standard target of 15 percent renewable generation capacity by 2020.⁴⁵

To capitalize on the support for clean energy technologies, Washington has passed legislation that supports workforce development opportunities throughout the state. In 2008, lawmakers directed the state workforce board to create Industrial Skills Panels in key energy-sector skill set areas (although such panels have not yet been adequately funded).⁴⁶ Additionally, Washington has made use of grant and Recovery Act-funded opportunities to create jobs through establishing substantial energy efficiency retrofit targets and pilot programs. Senate Bill 5649 (2009) sets a target of weatherizing 10,000 buildings over five years, while guaranteeing access to job and skills training opportunities to veterans and low-income or disadvantaged populations throughout the state.⁴⁷

POLICY-DRIVEN DEMAND: NEEDS AND OPPORTUNITIES

Creating job opportunities in the clean energy economy will require energy policies that create demand for workers. Kentucky has taken a few tentative steps in this direction over the last few years and the Recovery Act has meant new efforts and resources. However, significant gaps between Kentucky energy policy and many other states remain. Until those gaps are closed through stronger energy policy in Kentucky, it will be difficult for the state to create growing and sustainable demand for a clean energy workforce.

In 2008, Kentucky passed House Bill 2, a significant energy efficiency bill that set new efficiency standards for state government buildings and created tax credits for energy efficiency investments.

Governor Beshear issued a seven-part state energy plan in 2008 that included recommendations for stronger efforts in energy efficiency and renewable energy (in addition to support for new fossil fuel technologies). The state has also put in place net metering laws that create stronger financial incentives for small-scale distributed production of renewable energy.

Additionally, Kentucky has launched new residential energy efficiency efforts linked to Recovery Act resources. The state is implementing a two-tiered program to provide training and certification opportunities for workers, as well as financial incentives to homeowners, to increase the scale of energy efficiency residential retrofits throughout the state. The first program, applicable to households below 200 percent of the federal poverty guideline, is part of the federally funded Weatherization Assistance Program (WAP). Bolstered by expanded funding for an enhanced WAP (\$72 million, increased from \$7.6 million in 2009 and \$4.5 million in 2008) Community Action Kentucky (CAK) has employed a bid system for weatherization contractors throughout the state.⁴⁸ CAK and partners aim to weatherize 10,000 homes by the close of the Recovery Act funding period; as of June 2010, 2,000 homes have been weatherized through the program.⁴⁹ To address the additional 8,000 homes targeted, private sector contractor participation reinforcing CAA efforts will be essential and will yield additional opportunities for at least short-term job creation.

Building upon the job creation, retention and training potential presented by the expansion of the WAP, the state has created a second program targeting households above 200 percent of the federal poverty guideline with the goal of carrying out market-

rate residential retrofits. Kentucky Home Performance (KHP) will provide incentives to both contractors seeking training and certification under the Building Performance Institute, as well as homeowners seeking to improve the efficiency of their homes or lower utility bills.

To facilitate implementation of energy efficiency retrofits in state-owned and public buildings, the state has created the Green Bank of Kentucky Program to loan capital for upfront costs related to carrying out energy retrofits.⁵⁰ Specifically, energy loans can be used for either construction upgrades or retrofits that reduce energy usage and costs. Certain administrative costs—including some training opportunities and workforce development efforts—may also be covered by Green Bank loans. The funding for the Green Bank currently comes from Recovery Act-related funding, but in the future may be funded through Build America Bonds or other such tax-exempt construction bonds.

Kentucky Home Performance will provide incentives to both contractors seeking training and certification... as well as homeowners seeking to improve the efficiency of their homes or lower utility bills.

Despite these steps forward, there are critical policies that other states have put in place that will be necessary in Kentucky in order to pursue the true benefits of a clean energy economy. Renewable and Efficiency Portfolio Standards (REPS) are the cornerstone of state policy to advance clean energy. Twenty-nine states plus the District of Columbia—including Ohio, North Carolina, West Virginia and Illinois—have passed such renewable portfolio targets.

A renewable and efficiency portfolio standard requires an increasing percentage of a state's energy generation mix be met by certain eligible renewable energy sources and energy efficiency improvements according to a specific schedule. Such requirements are generally applicable to utility companies, but can have significant impact on renewable energy suppliers and energy efficiency service providers who can sell credits to the utilities in order to comply with the required schedule. The American Wind Energy Association has called an RPS "the single most important policy tool available" for promoting the growth of clean energy technologies.⁵¹

Other policies are also a common part of state energy strategies. A Public Benefits Fund is generally a small price on per-unit of electricity that is earmarked to support certain qualifying renewable energy or energy efficiency projects. Eighteen states and the District, including Ohio and Pennsylvania, have established Public Benefit Funds that benefit renewable and efficiency technologies. In many states, Ohio included, some portion of the money generated through the PBF is used to assist low-income customers in carrying out energy efficiency retrofits. Production-based incentives such as Feed-in Tariffs (FIT) are a popular regulatory mechanism in Europe, and according to a recent National Renewable Energy Laboratory report Feed-in Tariffs are responsible for

the installation of 75 percent of all solar photovoltaic and 45 percent of all wind development globally.⁵² A FIT is a policy mechanism that encourages the development of renewable energy by setting a fixed price for the purchase of electricity generated from renewable sources; it generally takes the form of a long-term contract and ensures grid access for the generator. Tennessee Valley Authority customers are already able to take advantage of a production-based incentive program for renewable energy, including a number of Kentucky utilities that subscribe to TVA power.

These policy tools would stimulate demand for the production of renewable energy and energy efficiency technologies, with a parallel potential to create supporting jobs for such industries that will outlast the immediate opportunities posed by the Recovery Act funding. Advocacy groups are actively pushing for such policy change in the state. The Kentucky Sustainable Energy Alliance (KySEA), a coalition of two dozen environmental, housing, economic development nonprofits and small businesses of which MACED is a member, supported legislation in the 2010 Kentucky General Assembly to establish an REPS and production-based incentives, and House Majority Floor Leader Rocky Adkins also introduced a version of REPS legislation. However, the legislature did not act upon either proposal in that session.⁵³



MODEL STATE PROGRAMS: **NEW YORK**

New York's Green Jobs/Green NY Act is a leader in sowing the seeds for quality jobs while advancing clean energy goals by focusing predominantly on residential energy efficiency improvements. Signed into law in October 2009, the legislation seeks "to promote energy efficiency, energy conservation and the installation of clean energy technologies, to reduce energy consumption and costs, reduce greenhouse gas emissions, support sustainable community development and to create green job opportunities."⁵⁴

Specifically, the program creates a mechanism for delivering residential energy efficiency retrofits to homeowners throughout the state by establishing a state-run Retrofit Investment Fund. By tapping federal and state incentives, the legislation sets up a model which, when fully implemented, will require no upfront cost to homeowners. A second, related piece of legislation that would approve the on-bill repayment and financing mechanism is currently in front of the New York legislature. The program itself will be administered by the New York State Energy Research and Development Authority, and supported by local community groups throughout the state. Furthermore, the training support associated with this effort—including incentives to contractors for hiring local workers—is expected to provide up to \$15 million in workforce training and job creation efforts.

KENTUCKY'S ENERGY WORKFORCE EFFORTS

The funding for both energy services and workforce development provided through the American Recovery and Reinvestment Act is creating both pressure and opportunity to set up new worker training systems and supports in this sector. Through its efforts to provide energy efficiency through the weatherization and new Kentucky Home Performance program mentioned earlier, Kentucky has adopted the Building Performance Institute (BPI) certification system for auditors and contractors. BPI is a nationally recognized system created by the New York State Energy Research and Development Authority. The state is working with the Kentucky Community and Technical College System to provide training and administer exams for this program. Eventually, all auditors and contractors participating in the program will have to meet BPI standards.

Additionally, the Kentucky Workforce Investment Board (KWIB) has developed expanded programs to capitalize on Recovery Act funding. Across the Adult, Dislocated Worker and Youth program areas Kentucky received over \$44 million to support workforce investment opportunities. The Commonwealth was also granted a \$4.74 million Department of Labor/Recovery Act State Energy Sector Partnership and Training Grant to train workers with skills relevant for emerging green industries, including smart grid, advanced manufacturing and green business start-up projects. The grant is administered by a steering committee comprised of energy interest groups from the state and private sector, and is slated to address specific high-growth industries and auto-impacted areas in particular.⁵⁵ Grant monies will be used to defray tuition and exam costs for new and incumbent workers interested in obtaining the BPI certification endorsed by the retrofit programs. In targeted areas, particularly in western Kentucky, advanced training will be available in the fields of chemical engineering, Smart Grid technology installations, and for pipefitters and steamfitters wishing to enhance their clean energy-related skills, such as installing solar hot water systems.

The State Energy Sector Partnership also supports the newly convened Consortium for Energy Workforce Development (CEWD), a partnership between utilities, labor, industry and educational institutions aimed at matching training opportunities with future job needs in the energy industry. In support of the newly formed Consortium, the Department of Energy Development and Independence will conduct a market survey to assess the specific skills employers are looking for and examine the training opportunities that currently exist

to provide those skills to workers. Such training will include Recovery Act-funded opportunities in other departments and organizations, such as the retrofitting training at KCTCS. As of now, the Consortium is focused primarily on conventional energy generating technologies and does not include renewable energy technologies; to best serve Kentucky's workforce, state resources should pursue all energy sectors with job creation potential.

These efforts are related to a new strategic plan by the state's workforce development system. Kentucky's Workforce Investment Board—the entity charged with advising the Governor on workforce development and training issue—has recommended significant structural changes to Kentucky's workforce system in a recent report entitled “WORKSmart Kentucky: A Strategic Transformation of Kentucky's Workforce System.”⁵⁶ Among the key recommendations made is the need to take a comprehensive sector-based approach to training and services within the workforce system. The Board notes that the energy sector presents a prime opportunity to deploy a sector-specific approach, given the programs and initiatives targeting clean energy jobs and policies emerging throughout the state. Aligning the workforce development system with existing efforts put forward by the state's programs and KCTCS would help reduce redundancies in the workforce system and expedite training opportunities for workers seeking access to the emerging clean energy economy. The KWIB strategy recommendations include the establishment of the concept of life-long learning as a norm throughout the workforce development system and thus could strengthen the state's commitment to the Career Pathways approach.⁵⁷

\$1.25 million in Recovery Act funding from the Department of Labor will support a labor market analysis of emerging green industries and green jobs in Kentucky. Coordinated by the Kentucky Office of Employment and Training, the results analysis is scheduled to be available in January 2011.⁵⁸ It is hoped that this study will provide adequate information about the existing skills of jobseekers in the state, as well as insight into specific needs of existing companies and industries. Assessing the current needs and opportunities will inform future curriculum and training development and help prepare workers for emerging green jobs and industries as opportunities develop in Kentucky.

STRENGTHS OF THE KENTUCKY APPROACH

Initially, the energy-efficiency focused efforts were housed under a coalition named the Clean Energy Corps (CEC), convened by Governor Beshear's administration and Finance & Administration Cabinet Secretary Jonathan Miller in February 2009 to address modest-income residential energy efficiency improvements throughout Kentucky. By establishing the Clean Energy Corps as an umbrella group for state-led efforts on energy efficiency, Kentucky attempted to confront the challenge of fragmentation that so frequently afflicts issues that cross agency boundaries. Given the time constraints of the Recovery Act funding resources, programs were eventually implemented by different agencies leading to a reduced role for the CEC. But the CEC has demonstrated the importance of efforts to set up structures for better cross-agency collaboration, as can also be seen in the newer Energy Sector Partnership and the Consortium for Energy Workforce Development. Future efforts should reflect this umbrella approach to the energy sector.

By implementing an external, nationally recognized training certification for qualifying retrofits in the BPI Building Analyst credential, Kentucky is ensuring workers' certifications are portable and meaningful. Creating a common standard also is creating the opportunity to link and expand the markets for contractors and workers engaged in the sector. BPI-certified businesses and workers will be able to pursue opportunities in state-sponsored residential and commercial programs and in the public building sector. This is the basis for linkages that could lead to career ladders for workers.

Among the most essential aspects of the state's new programs is the financing that allows consumers to defray or delay upfront costs. The widespread ability of homeowners to finance retrofits will go a long way towards ensuring long-term demand

for workers in that sector. By supporting the development of demand for private sector retrofits through Home Performance and WAP, as well as public sector retrofits through the Green Bank and High Performance Building Standards, Kentucky is laying the groundwork for more permanent opportunities that extend beyond Recovery Act funding.⁵⁹

There is recognition by many working within the state's efficiency efforts that Recovery Act funds are time-limited and must be leveraged to create more permanent job opportunities and long-term markets. Furthermore, building on the experience of health care career pathways, these employment opportunities have the potential to provide family supporting wages and long-term work for those prepared with proper training and skills.

To this end, Kentucky efforts strive to not only provide training and certification but to help create a marketing infrastructure for the newly trained and certified workers. One such example is the Kentucky Home Performance website and promotional materials that participating workers and businesses can use to raise awareness among homeowners. These efforts, along with continued rebates, tax credits and other such financially oriented policy tools, are part and parcel of the attempt to build a stable market for efficiency technology—and with it jobs—in the Commonwealth.

In an attempt to make best use of existing resources, the Kentucky Housing Corporation has partnered with the existing community and technical college system to provide the training and certification to BPI standards. This is significant in that it allows the new job training opportunities to embed within the mainstream community college system—not requiring boutique programs that are unknown to most Kentuckians. This may make the new training more accessible to more workers.

WEAKNESSES OF THE KENTUCKY APPROACH

While Kentucky is beginning to address the clean energy jobs interface, substantial effort needs to be made to ensure the success of a long-term, coherent strategy to benefit workers across all income groups. For example, low-income workers are not currently explicitly targeted by the clean energy economy-related employment programs and services. There is not yet a clear way or strategy through which low-income people are deliberately being provided access to the job training ladder in this sector, such as through bridge programs, wraparound services, targeted hiring and so forth. Ample evidence supports the claim that tuition for educational

programs of all kinds has been rising in Kentucky, yet there is no clear strategy to address tuition affordability, particularly for low-income workers seeking additional training and certification.⁶⁰ Kentucky's system does not, as of yet, overtly focus on low-income workers' ability to access emerging clean energy economy jobs. Where other states have set incentives for contractors to employ local laborers or low-income workers, Kentucky has not made progress on this front.

While the Recovery Act funding has prompted a focus on job creation measured by quantity, there has not yet been sufficient attention paid to the quality of such jobs. Kentucky's long-term economic success hinges on jobs created or retained that have a wage standard which supports a family. To achieve this goal, workforce and economic development efforts will need to prioritize job quality as well as job quantity in assessing job creation potential.

Given the time-sensitivity and urgency of the Recovery Act's funds use-or-lose nature, there is a danger of the state continuing with 'work first' habits, whereby the immediacy of the job opportunities trumps a systemized approach to career paths and long-term employment opportunity. While the pressures and constraints of the Recovery Act funding are real, so are the opportunities to use the immediate opportunity to establish longer-term systems.

While the Clean Energy Corps was originally convened as an umbrella group for the state's efforts, the funding sources, decision-making structures and reporting hierarchies were not aligned to allow for the CEC to function as a true clearinghouse for promoting clean energy sector jobs

and programs. As a result, individual programs such as the Weatherization program and the Home Performance program have migrated back to their respective agencies for implementation. While this in and of itself does not present a problem, the strongest contribution of the Clean Energy Corps was to provide a one-stop-shop for sharing information on clean energy related efforts across the state. Several initiatives have formed as potential successors to the largely defunct CEC, but these sector partnerships and related efforts lack the wide base of support and participation to be truly effective. Additionally, the Consortium on Workforce Development maintains a focus on fossil fuels.

As mentioned previously, the lack of an adequate energy policy framework also presents serious challenges. While some effort is being made to encourage market-rate programs for energy efficiency and renewable energy, the policy framework is not yet strong enough to rely on the permanence of this market. Many of the state's programs are in the pilot phase or just beginning. Foundational policies such as an REPS are not in place and thus cannot ensure the need for newly trained workers will continue past the immediate funding opportunity of the Recovery Act. Supporting programs, like the labor market analysis being carried out by the state, are not clearly positioned to continue past the Recovery Act phase and thus run the risk of serving as a one-off exercise. Several states held up as models throughout the country rely on ongoing funding streams to sustain the work. Kentucky, however, lacks an independent funding source outside of the Recovery Act to fund on-going training in this sector.



MODEL STATE PROGRAMS: **MASSACHUSETTS**

Massachusetts created a lead agency, the Massachusetts Clean Energy Technology Center to coordinate the state's efforts on a clean energy economy. Additionally, the state created the Alternative and Clean Energy Investment Trust Fund in 2008 as a mechanism for promoting investment in clean energy technology and supporting job creation. Using this fund, Massachusetts then allocated \$1 million in funding for a workforce development grant program to support educational institutions in the provision of clean energy industry skills programs. An additional \$1 million was allocated for a 'pathways out of poverty' initiative that will result in a competitive grants program to "clean energy companies, community-based nonprofit organizations, educational institutions or labor organizations to enable said entities to carry out training programs associated with the clean energy industry that lead to economic self-sufficiency."⁶¹

MODELS TO DRAW UPON

One of the key elements successful models have in common is the development of a baseline labor market analysis and report, to understand the larger context in which energy-focused workforce development efforts will function.

In that respect, several states have developed statewide reports that serve as models for the rest of the country.

- Oregon’s *Analysis of Clean Energy Workforce Needs and Programs in Oregon* (June 2008)⁶²
- Tennessee’s *Growing Green: The Potential for Green Job Growth in Tennessee* (November 2008)⁶³
- Washington’s *Green Economy Jobs* (January 2009)⁶⁴
- Pennsylvania’s *The Pennsylvania Green Jobs Report: Part 1* (January 2010)⁶⁵

In some cases, such studies have been conducted not by government agencies but by nonprofit or trade association organizations seeking to make the case for green job development and training programs within a state.

- Colorado’s potential, mapped by the American Solar Energy Society (December 2008)⁶⁶
- Wisconsin’s *Greener Pathways* report by the Center on Wisconsin Strategy, Apollo Alliance and the Workforce Alliance (March 2008)⁶⁷
- Policy Matters Ohio and the Apollo Alliance’s *Mapping Green Career Pathways* (January 2010)⁶⁸
- Environment North Carolina’s *Working with the Sun* (May 2010)⁶⁹

APPROACHES TO POLICY

One of the leading national groups engaging in workforce development and green jobs advocacy is the Center on

Federal resources, then, should be directed towards supporting strong standards nationally—and encouraging local links to such programs where they exist.

Wisconsin Strategy (COWS). In the recently released *Greener Skills* report, COWS identifies one of the biggest barriers to existing training efforts in the phrase, “all credentials are not created equal”.⁷⁰ To rectify the shortcomings of these inconsistencies, COWS advocates first and foremost for the establishment of a national agreement on skills standards, and the creation of a certifications system that reflects such agreements. Credentials can then be:

- *meaningful in the labor market*, because they have value to employers;
- *transparent*, so workers know how to earn them;
- *embedded in a pathway*, clearly connected to either a job or the next level of training;
- *standardized*, reflecting common measures of competence;
- *portable*, not limited to a particular region, employer, or institution.

Federal resources, then, should be directed towards supporting strong standards nationally—and encouraging local links to such programs where they exist. Similarly, state governments can encourage linking local workforce development initiatives and standards with nationally recognized programs, thus leveraging additional benefits from existing grassroots efforts. By strengthening existing programs, COWS believes redundancies of new green jobs programs can be avoided and thus resources can be directed to ensuring the neediest workers—long-term unemployed, dislocated workers or those in poverty-wage jobs—can tap into the opportunities created through such programs.

In working on the Green Jobs/Green New York program, the Center for Working Families has prioritized two program elements: ensuring jobs make use of local employment resources and including local community support in decision-making. CWF recognizes the ineffectiveness of providing

quality training programs if, at the conclusion of such programs, there are no jobs to employ successful trainees. Thus, linking trainees to local jobs is one of the core elements of CWF's program.

Green for All, a national organization working on poverty alleviation through the lens of building new opportunities in a robust green economy, identifies five crucial aspects of a successful workforce development program, particularly one that targets low-income populations:⁷¹

- Knowing the services, resources and advocacy needed for its target population.
- Building strong relationships with the industry and its representatives in order to help the industry grow and connect graduates to good jobs.

- Providing education, skills and industry certifications to bring its target population to the industry employment opportunities.
- Meaningfully measuring and reporting success.
- Diversifying its funding.

Such elements will contribute to not only successful green jobs-training efforts, but also matching low-income workers with quality jobs that will allow workers to lift themselves out of poverty. The Apollo Alliance, a national coalition of labor, business, environmental and community leaders, has contributed to similar efforts to support career pathways for good jobs that especially benefit low-income workers while advancing a clean energy agenda.

POLICY RECOMMENDATIONS

Based on the capacity of existing efforts in Kentucky, as well as the potential to realize significant additional job opportunities in the clean energy economy throughout the Commonwealth, the need for substantial policy action is clear.

Specifically, Kentucky could take six concrete policy steps to carve out a place for the Commonwealth in the clean energy economy.

1 Put in place policies that strengthen and make sustainable demand for workers in the renewable energy and energy efficiency sectors. Those policies should include an increasing portfolio standard for renewable energy generation and energy efficiency savings, as well as financing elements that spur investment in energy efficiency and renewable energy among energy developers, businesses, institutions and homeowners.

2 Establish a lead agency or taskforce to spearhead planning, communication and cross-agency cooperation regarding state efforts related to the clean energy economy along the lines of the Clean Energy Corps. A cross-agency effort can ensure needed coordination while a strong plan can help ensure Kentucky is taking full advantage of the emerging opportunities in the clean energy economy.

3 Strengthen mapping of job opportunities and career pathways in this sector through a recurring labor market study, and ensure mapping includes a path for access to the career pathways for low-income, low-skilled Kentuckians. This information should be presented through a usable interface that is accessible for workers, as well as localities looking for information about expanding job opportunities, and should be an input to the overall plan mentioned above.

4 Build upon existing systems, institutions and certifications to ensure career-oriented, good-paying jobs are created or retained through policy developments. Wherever possible, certifications should be nationally recognized to ensure mobility and applicability throughout the country.

5 Increase access to training to include:

- funding for clean energy training with a particular focus on financial assistance for low-income people seeking training, including means-tested scholarships;
- strengthening links between training programs and existing workforce infrastructure including WIA, TANF, etc., as well as wrap-around services for low-income people; and,
- increasing access to apprenticeship programs and skilled trades in this area, such as the creation of pre-apprenticeship opportunities.

6 Promote low-income hiring and job quality standards where possible as the clean energy economy continues to gain momentum. Crediting contractors who pledge to hire local or low-income workers on bids for state-financed projects will help to that the jobs created benefit all workers, particularly those who are most disadvantaged.

By implementing these policy changes Kentucky stands to build upon the strengths of the current system, expand successful models to include clean energy jobs, and address known challenges facing the current workforce and policy landscape. Kentucky is well poised to take advantage of the opportunities presented through a clean energy economic transition. To miss this boat would be to commit the Commonwealth to lagging behind other states for years to come.

CONCLUSION

The state of Kentucky has significant resources available now to put towards a transition to a clean energy economy, some of which require only more targeted use of existing funds and efforts. By streamlining the government interface with the clean energy economy through the creation of a single umbrella entity, by aligning workforce development and training efforts with the needs of clean energy employers, by reducing hurdles to participation in training and education efforts for all Kentuckians, and by demonstrating a policy commitment to pursuing clean energy sources Kentucky can begin to harness the employment opportunities inherent in the clean energy sector in earnest. The immediate benefits include lower utility bills for homeowners, additional employment opportunities for workers and buffering ratepayers across the state from the likely impacts of future regulations on carbon emissions. Significant leadership across the Commonwealth will be required to move Kentucky forward and ensure the state capitalizes on the opportunities available today.

ADDITIONAL RESOURCES AND REFERENCES

- American Wind Energy Association, et al, “Winds of Change: A Manufacturing Blueprint for the Wind Industry” (June 2010): www.awea.org/documents/reports/BGA_Report_062510_FINAL.pdf
- Apollo Alliance and Center on Wisconsin Strategy, “Mapping Green Career Pathways: Job Training Infrastructure and Opportunities in Wisconsin” (January 2010): www.cows.org/pdf/rp-mappingreportWI.pdf
- Apollo Alliance and Policy Matters Ohio, “Mapping Green Career Pathways: Job Training Infrastructure and Opportunities in Ohio” (January 2010): www.policymattersohio.org/pdf/MappingGreenCareerPathways2010.pdf
- Apollo Alliance and Corporation for a Skilled Workforce, “Mapping Green Career Pathways: Job Training Infrastructure and Opportunities in Michigan” (January 2010): www.apolloalliance.org/wp-content/uploads/2010/01/mappingreportmichiganjan27.pdf
- California Green Jobs & Clean Energy Workforce Training Program: www.energy.ca.gov/cleanenergyjobs/
- Center on Wisconsin Strategy, “Greener Skills: How Credentials Create Value in the Clean Energy Economy” (2010): www.cows.org/pdf/rp-greenerkills.pdf
- Department of Labor and Workforce Development, “Growing Green: the Potential for Green Job Growth in Tennessee” (November 2008): www.state.tn.us/labor-wfd/Publications/EmploymentSecurity/GrowingGreenInTN2008.pdf
- Downstream Strategies, “The Decline of Central Appalachian Coal and the Need for Economic Diversification” (January 2010): www.downstreamstrategies.com/Documents/reports_publication/DownstreamStrategies-DeclineOfCentralAppalachianCoal-FINAL-1-19-10.pdf
- Economic Policy Institute, “Green Investments and the Labor Market: How Many Jobs Could be Generated and What Type?” (April 2009): www.epi.org/publications/entry/ib253/
- EPA’s Clean Energy Workforce Development Resources for States (February 2009): www.epa.gov/slclimat/documents/pdf/background_resources_workforce_2-24-2009.pdf
- Kentucky Workforce Investment Board, “WORKSmart Kentucky: A Strategic Transformation of Kentucky’s Workforce System” (May 2010): www.kwib.ky.gov/documents/WorkSmartStrategicPlan.pdf
- Mountain Association for Community Economic Development, “Investing in Kentucky’s Working Families: A Path to Shared Prosperity in the Commonwealth” (March 2010): www.maced.org/files/WPPF%20Report%202010%20web.pdf
- National Governor’s Association: www.nga.org/portal/site/nga/menuitem.9123e83a1f6786440ddcbeeb501010a0/?vgnnextoid=ce5bea15a18e3210VgnVCM1000005e00100aRCRD
- Pennsylvania Department of Labor and Industry, “The Pennsylvania Green Jobs Report: Part 1” (January 2010): www.portal.state.pa.us/portal/serverpt?open=18&objID=806057&mode=2
- Pew Charitable Trusts, “The Clean Energy Economy: Repowering Jobs, Businesses, and Investments across America” (June 2009): www.pewcenteronthestates.org/uploadedFiles/Clean_Economy_Report_Web.pdf
- Policy Matters Ohio, “Building Green Pathways out of Poverty” (October 2010): www.policymattersohio.org/pdf/GreenPathways2010.pdf
- Political Economy Research Institute at University of Massachusetts Amherst, “Green Recovery: A Program to Create Good Jobs and Start Building a Low-Carbon Economy” (September 2008): www.americanprogress.org/issues/2008/09/pdf/green_recovery.pdf
- Urban Institute, “Low-Skill Workers’ Access to Quality Green Jobs” (May 2010): www.urban.org/publications/412096.html
- U.S. EPA State and Local Climate and Energy Program: Workforce Development Resources: www.epa.gov/statelocalclimate/local/topics/workforce.html
- Working Poor Families Project, “A Pathway to Clean Jobs and Prosperity: State Policies for Helping Low-Income Working Families Build Clean Energy Careers” (2010): www.workingpoorfamilies.org/pdfs/WPPF_policybrief_spring2010.pdf

ENDNOTES

- ¹ “Current Employment Statistics survey, State and Metro Area (Seasonally adjusted)”, Bureau of Labor and Statistics available at www.bls.gov/news.release/laus.t05.htm. Retrieved October 29, 2010.
- ² Joel Makower, Ron Pernick and Clint Wilder, “Clean Energy Trends 2007”, Clean Edge, March 2007, www.cleandedge.com/reports/Trends2007.pdf, as cited in “Make it in America: The Apollo Green Manufacturing Action Plan,” Apollo Alliance, March 2009, www.apolloalliance.org/wp-content/uploads/2009/03/greenmap_proposal031109.pdf. Retrieved July 20, 2010.
- ³ “Renewable Energy Trends in Consumption and Electricity,” U.S. Energy Information Administration, 2008, www.eia.doe.gov/cneaf/solar.renewables/page/trends/rentrends.html. Retrieved October 25, 2010.
- ⁴ Bracken Hendricks, Benjamin Goldstein, Reid Detchon and Kurt Shickman, “Rebuilding America: A Policy Framework for Investing in Energy Efficiency Retrofits,” Center for American Progress, August 10, 2009, www.americanprogress.org/issues/2009/08/rebuilding_america.html. Retrieved June 24, 2010.
- ⁵ Kentucky Legislative Research Commission. 2004. *The Competitiveness of Kentucky’s Coal Industry* (Research Report No. 318). Frankfort, KY as cited in “Mining Employment and Production Trends,” Mountain Association for Community Economic Development, June 2009, www.maced.org/coal/mining-employ.htm. Retrieved July 20, 2010.
- ⁶ Rory McIlmoil and Evan Hansen, “The Decline of Central Appalachian Coal and the Need for Economic Diversification,” Downstream Strategies, January 19, 2010, www.downstreamstrategies.com/Documents/reports_publication/DownstreamStrategies-DiversionOfCentralAppalachianCoal-FINAL-1-19-10.pdf. Retrieved June 24, 2010.
- ⁷ America’s Power: The Facts, www.americaspower.org/The-Facts/. Retrieved July 20, 2010.
- ⁸ Average Price by State by Provider (EIA-861), U.S. Energy Information Administration available at www.eia.doe.gov/cneaf/electricity/epm/table5_6_a.html. Retrieved October 29, 2010.
- ⁹ “The Clean Energy Economy Factsheet: Kentucky,” The Pew Environment Group, www.pewglobalwarming.org/cleanenergyeconomy/Clean_Energy_Economy_State_Factsheets.pdf. Retrieved July 20, 2010.
- ¹⁰ Robert Pollin, James Heintz, and Heidi Garrett-Peltier “The Economic Benefits of Investing in Climate Change,” Department of Economics and Political Economy Research Institute University of Massachusetts, Amherst, June 2009, www.americanprogress.org/issues/2009/06/pdf/peri_report.pdf. Retrieved July 20, 2010.
- ¹¹ Marilyn A. Brown, Etan Gumerman, Xiaojing Sun, et al. “Energy Efficiency in the South,” Georgia Institute of Technology Ivan Allen College School of Public Policy and Duke University Nicholas Institute for Environmental Policy Solutions, April 12, 2010, www.seealliance.org/se_efficiency_study/full_report_efficiency_in_the_south.pdf. Retrieved July 20, 2010.
- ¹² Marilyn A. Brown, Joy Wang, Matt Cox, et al. “State Profiles of Energy Efficiency Opportunities in the South: Kentucky,” Georgia Institute of Technology and Duke University, April 2010, www.seealliance.org/se_efficiency_study/kentucky_efficiency_in_the_south.pdf. Retrieved July 20, 2010.
- ¹³ Brown and Wang, 4.
- ¹⁴ Brown and Wang, 5.
- ¹⁵ Brown and Wang, 5-6.
- ¹⁶ Brown and Wang, 8.
- ¹⁷ “Civilian labor force and unemployment by state and selected area, seasonally adjusted”, Bureau of Labor Statistics, last modified January 22, 2010, www.bls.gov/news.release/srgune.nr0.htm, Accessed March 9, 2010 as cited in Brown and Wang, 8.
- ¹⁸ Natalie Mims, Mathias Bell and Stephen Doig, “Assessing the Electric Productivity Gap and the U.S. Efficiency Opportunity,” Rocky Mountain Institute, January 2009, www.ert.rmi.org/files/documents/CGU.RMI.pdf. Retrieved July 20, 2010.
- ¹⁹ Mims, Bell and Doig, 20.
- ²⁰ Maggie Molina, Max Neubauer, Michael Sciortino, et al. “The 2010 State Energy Efficiency Scorecard”, American Council for an Energy-Efficient Economy, October 2010, www.aceee.org/sites/default/files/publications/researchreports/el107.pdf. Retrieved October 14, 2010.
- ²¹ Molina, Neubauer, Sciortino, 15.
- ²² “An Overview of Kentucky’s Energy Consumption and Energy Efficiency Potential,” Kentucky Pollution Prevention Center at the University of Louisville and American Council for an Energy-Efficient Economy, August 2007, www.louisville.edu/kppc/files/kppc/KYE2PotentialStudyFinalReport82207_508.pdf. Retrieved October 25, 2010.
- ²³ KPPC and ACEEE, 3.
- ²⁴ Kevin Witchger and Roger Lawrence, “Clean Heat and Power The Kentucky Aluminum Industry: A Market Analysis for CHP,” U.S. DOE Southeast CHP Applications Center at North Carolina State University, July 2, 2009, www.chpcenterse.org/pdfs/KY_Aluminum.pdf. Retrieved October 25, 2010.
- ²⁵ Josh Bivens, John S. Irons and Ethan Pollack, “Green Investments and the Labor Market: How many jobs could be generated and what type?,” Economic Policy Institute, April 7, 2009, www.epi.3cdn.net/3ede40f054b5406d66_q6m6b9ne5.pdf. Retrieved August 20, 2010.

- ²⁶ *Current Employment Statistics: 2009*, Workforce Kentucky Labor Market Information, 2009 available at www.workforcekentucky.ky.gov/?PAGEID=67&SUBID=117. Retrieved October 25, 2010.
- ²⁷ Workforce Kentucky Labor Market Information.
- ²⁸ George Sterzinger, “Wind Turbine Development: Location of Manufacturing Activity,” Renewable Energy Policy Project, September 2004, www.repp.org/articles/static/1/binaries/WindLocatorShort.pdf as cited in Apollo Alliance, *Make it in America*, 2009. Retrieved July 20, 2010.
- ²⁹ “Winds of Change: A Manufacturing Blueprint for the Wind Industry,” American Wind Energy Association, Blue Green Alliance and United Steel Workers, June 2010, www.bluegreenalliance.org/admin/publications/files/BGA-Report-062510_FINAL.pdf. Retrieved October 19, 2010.
- ³⁰ AWEA, Blue Green Alliance and United Steel Workers, 13.
- ³¹ “GE’s plan to add 830 jobs to Louisville draws VP Biden”, GE Reports, June 29, 2010 www.gereports.com/ges-plan-to-add-830-jobs-to-louisville-draws-vp-biden/. Retrieved October 25, 2010.
- ³² Energy and Environment Cabinet, Department for Energy Development and Independence, Division of Renewable Energy, www.energy.ky.gov/renewable/Pages/default.aspx. Retrieved August 20, 2010.
- ³³ “Final Report from the Executive Task Force on Biomass and Biofuels Development in Kentucky,” Governor’s Office of Agricultural Policy and the Energy and Environment Cabinet, December 10, 2009, www.energy.ky.gov/Documents/BTF/Final%20Report.pdf. Retrieved October 25, 2010.
- ³⁴ “U.S. Solar Market Insight 2nd Quarter 2010 report,” Solar Energy Industries Association, October 2010, www.seia.org/galleries/pdf/SEIA_Q2_2010_EXEC_SUMMARY.pdf. Retrieved October 19, 2010.
- ³⁵ Billy Roberts, “Photovoltaic Solar Resource of the United States, National Renewable Energy Laboratory, October 20, 2008, www.nrel.gov/gis/images/map_pv_national_lo-res.jpg. Retrieved August 20, 2010; and Iris Kuo, “New reports say American solar outlook is bright, but German still dominates,” October 20, 2010, www.venturebeat.com/2010/10/20/new-reports-say-american-solar-outlook-is-bright-but-germany-still-dominates/. Retrieved October 25, 2010.
- ³⁶ “Estimates of Windy Land Area and Wind Energy Potential By State,” National Renewable Energy Laboratory and AWS Truewind, February 2010, www.windpoweringamerica.gov/docs/wind_potential.xls. Retrieved August 20, 2010.
- ³⁷ *Wisconsin Regional Training Partnership* available at www.wrtip.org. Retrieved November 1, 2010.
- ³⁸ Josh Bivens, John Irons and Ethan Pollack, “Green Investments and the Labor Market” as cited in Sarah White and Kate Gordon, *Mapping Green Career Pathways: Job Training Infrastructure and Opportunities in Wisconsin*, Center on Wisconsin Strategy and Apollo Alliance, January 2010, www.cows.org/pdf/rp-mappingreportWI.pdf. Retrieved October 27, 2010.
- ³⁹ Harry J. Holzer and Robert I. Lerman, “America’s Forgotten Middle-Skill Jobs: Education and Training Requirements in the Next Decade and Beyond,” *Skills2Compete*, 2007, www.urban.org/publications/411633.html as cited in “Investing in Kentucky’s Working Families: A Path to Shared Prosperity in the Commonwealth,” Mountain Association for Community Economic Development, March 2010, www.maced.org/files/WFPF%20Report%202010%20web.pdf. Retrieved October 27, 2010.
- ⁴⁰ “Middle Skill Jobs State by State,” National Skills Coalition, www.nationalskillscoalition.org/resources/fact-sheets/state-fact-sheets/nsc_middleskillfs_kentucky.pdf. Retrieved October 29, 2010.
- ⁴¹ *State Rankings: Persons below Poverty Level, 2008* available at www.census.gov/compendia/statab/2010/ranks/rank34.html. Retrieved October 27, 2010.
- ⁴² *KCTCS Career Pathways Initiative* available at www.kctcs.edu/System_Initiatives/Career_Pathways.aspx. Retrieved October 27, 2010.
- ⁴³ *Registration of Apprenticeship Programs*, Kentucky Department of Labor, Division of Employment Standards, Apprenticeship and Mediation available at www.lrc.state.ky.us/KAR/803/001/010.htm. Retrieved October 27, 2010.
- ⁴⁴ *History of the Washington State Building Code Council* available at www.fortress.wa.gov/ga/apps/sbcc/Page.aspx?nid=11. Retrieved October 27, 2010.
- ⁴⁵ *Renewable Energy Standard: Washington, Database for State Incentives for Renewables & Efficiency*, available at www.dsireusa.org/incentives/incentive.cfm?IncentiveCode=WA15R&re=1&ee=1. Retrieved October 27, 2010.
- ⁴⁶ Washington. 2008. *Washington Comprehensive Green Economy Jobs Growth Initiative*. Revised Code of Washington 43.330.310. Retrieved November 1, 2010 available at www.apps.leg.wa.gov/Rcw/default.aspx?cite=43.330.310.
- ⁴⁷ Washington. 2009. Energy Efficiency, S.B. 5649. Retrieved November 1, 2010, available at www.apps.leg.wa.gov/documents/billdocs/2009-10/Pdf/Bills/Session%20Law%202009/5649-S2.SL.pdf as cited in *Washington State Senate Bill 5649 Summary*, Green for All, available at www.greenforall.org/resources/washington-senate-bill-5649. Retrieved November 1, 2010.
- ⁴⁸ *Weatherization Assistance Program Technical Assistance Center: Kentucky Profile* available at www.waptac.org/Grantee-Contacts.aspx?dstate=KY. Retrieved October 27, 2010.

- ⁴⁹ Rick Boggs, Chief Information Officer for Kentucky Housing Corporation, meeting attended by author, written notes, Frankfort, KY, June 21, 2010.
- ⁵⁰ *Green Bank of Kentucky* available at www.finance.ky.gov/greenbank/. Retrieved October 27, 2010.
- ⁵¹ AWEA, Blue Green Alliance and United Steel Workers, 22.
- ⁵² “Global Energy Transfer Feed-in Tariffs for Developing Countries,” Deutsche Bank Climate Change Advisers, April 2010, www.dbcca.com/dbcca/EN/_media/GET_FiT_Program.pdf as cited in Toby D. Couture, Karlynn Cory, Claire Kreycik and Emily Williams, “A Policymaker’s Guide to Feed-in Tariff Policy Design,” National Renewable Energy Laboratory, July 2010, www.nrel.gov/docs/fy10osti/44849.pdf. Retrieved October 27, 2010.
- ⁵³ Kentucky. 2010. H.B. 408 (proposed). Retrieved November 1, 2010 available at www.lrc.ky.gov/record/10RS/HB408.htm.
- ⁵⁴ New York. 2009. *Green Jobs-Green New York Act of 2009*. S.5888. Retrieved November 1, 2010 available at www.open.nysenate.gov/legislation/api/html/bill/S5888.
- ⁵⁵ “Kentucky receives \$4.74 million green jobs grant,” Press Release from Governor Steve Beshear’s Communications Office, January 22, 2010, www.governor.ky.gov/pressrelease.htm?PostingGUID={6F381E41-1461-4093-875A-F45E62B4ED60}. Retrieved October 27, 2010.
- ⁵⁶ “WorkSmart Kentucky: A Strategic Transformation of Kentucky’s Workforce System,” Kentucky Workforce Investment Board, May 2010, www.kwib.ky.gov/documents/WorkSmartStrategicPlan.pdf. Retrieved July 20, 2010.
- ⁵⁷ KWIB, 24.
- ⁵⁸ *American Recovery and Reinvestment Act of 2009: State Labor Market Information Grants*, U.S. Department of Labor Employment and Training Administration, February 4, 2010, www.doleta.gov/pdf/LMI_Grant_Summaries_02052010.pdf. Retrieved October 27, 2010. Kyna Estes, Green Job Coordinator for Kentucky Office of Employment and Training, interview by author, written notes, Berea, KY, June 16, 2010.
- ⁵⁹ Kentucky. 2008. *Promotion of the Efficient Use of Energy*. H.B. 2. Retrieved November 1, 2010, available at www.lrc.state.ky.us/record/08rs/hb2.htm.
- ⁶⁰ MACED, “Investing in Kentucky’s Working Families,” 13.
- ⁶¹ Massachusetts. 2008. *Green Jobs in the Commonwealth*, Chapter 307 of the Acts of 2008. Retrieved November 1, 2010, available at www.mass.gov/legis/laws/seslaw08/sl080307.htm
- ⁶² Cylvia Hayes, David Rafkind and Barbara Byrd, “Analysis of Clean Energy Workforce Needs and Programs in Oregon,” 3E Strategies, the Business Alliance for Sustainable Energy and Oregon AFL-CIO, June 2008, www.worksourceoregon.org/index.php/component/docman/doc_details/734-analysis-of-clean-energy-workforce-needs-and-programs-in-oregon. Retrieved November 1, 2010.
- ⁶³ “Growing Green in Tennessee,” Labor Market Information Section, Employment Security Division, Tennessee Department of Labor and Workforce Development, November 2008, www.state.tn.us/labor-wfd/Publications/EmploymentSecurity/GrowingGreenInTN2008.pdf. Retrieved July 20, 2010.
- ⁶⁴ Karen T. Lee, Greg Weeks and Mary Ayala, “2008 Green Economy Jobs in Washington State,” Washington State Employment Security Department, January 2009, www.energy.wsu.edu/documents/Green_Jobs_Report_2008.pdf. Retrieved November 1, 2010.
- ⁶⁵ “The Pennsylvania Green Jobs Report: Part 1,” Pennsylvania Department of Labor & Industry, January 2010, www.portal.state.pa.us/portal/server.pt?open=18&objID=806057&mode=2. Retrieved February 9, 2010.
- ⁶⁶ “Defining, Estimating, and Forecasting the Renewable Energy and Energy Efficiency Industries in the U.S and in Colorado,” American Solar Energy Society and Management Information Services, Inc., December 2008, www.greenbiz.com/business/research/report/2009/01/15/defining-estimating-and-forecasting-renewable-energy-and-energy-efficienc. Retrieved November 1, 2010.
- ⁶⁷ Sarah White and Jason Walsh, “Greener Pathways: Jobs and Workforce Development in the Clean Energy Economy,” Center on Wisconsin Strategy, The Workforce Alliance and The Apollo Alliance, March 2008, www.cows.org/pdf/rp-greenerpathways.pdf. Retrieved July 20, 2010.
- ⁶⁸ Piet van Lier, Amanda Woodrum and Kate Gordon, “Mapping Green Career Pathways: Job Training Infrastructure and Opportunities in Ohio,” Policy Matters Ohio and the Apollo Alliance, January 2010, www.policymattersohio.org/pdf/MappingGreenCareerPathways2010.pdf. Retrieved July 20, 2010.
- ⁶⁹ Travis Masden and Elizabeth Outzts, Working with the Sun: How solar power can protect North Carolina’s environment and create new jobs, Frontier Group and Environment North Carolina Research & Policy Center, May 2010, www.environmentnorthcarolina.org/uploads/ca/80/ca809d139d551c92990e082edc6e4b15/Working-with-the-Sun.pdf. Retrieved October 27, 2010.
- ⁷⁰ Sarah White, Laura Dresser and Joel Rogers, “Greener Skills: How Credentials Create Value in the Clean Energy Economy,” Center on Wisconsin Strategy, 2010, www.cows.org/pdf/rp-greenerkills.pdf. Retrieved November 1, 2010.
- ⁷¹ “Green Pathways Out of Poverty: Workforce Development Initiatives,” Green for All, 2009, www.greenforall.org/what-we-do/building-a-movement/community-of-practice/green-pathways-out-of-poverty-workforce-development-initiatives/download. Retrieved November 1, 2010.



Mountain Association for Community Economic Development
433 Chestnut Street • Berea, KY 40403 • 859-986-2373 • www.maced.org