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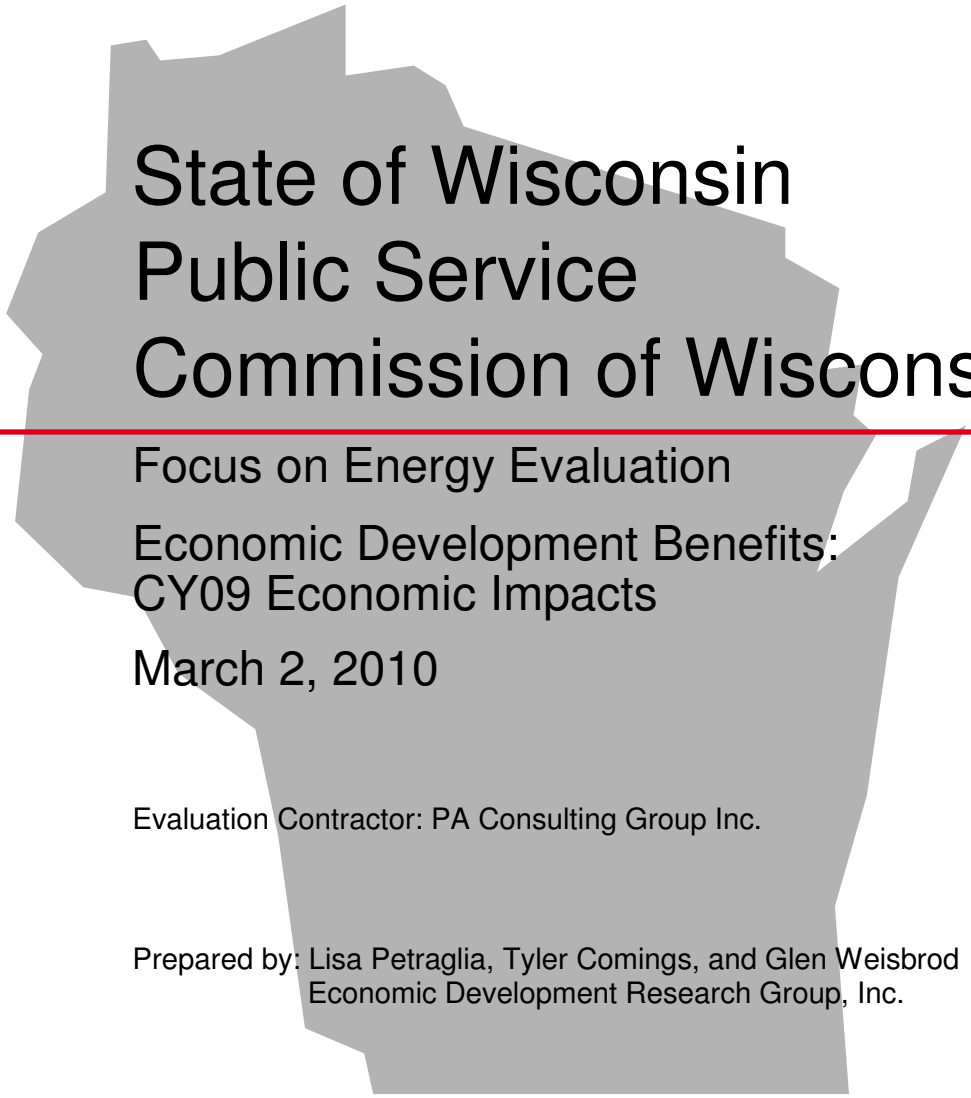

State of Wisconsin Public Service Commission of Wisconsin

Focus on Energy Evaluation

Economic Development Benefits: CY09 Economic Impacts

March 2, 2010

Evaluation Contractor: PA Consulting Group Inc.

Prepared by: Lisa Petraglia, Tyler Comings, and Glen Weisbrod
Economic Development Research Group, Inc.

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Liaison Contact: Dr. David Sumi
PA Consulting Group, Inc.
6410 Enterprise Lane, Suite 300
Madison, Wisconsin 53719
Tel.: +1 608 316 3700
Fax: +1 608 661 5181
E-mail: david.sumi@paconsulting.com

Prepared by: Lisa Petraglia, Tyler Comings, and Glen Weisbrod
Economic Development Research Group, Inc.

Acknowledgment: Ralph Prahl, Prahl & Associates, contributed critical review and analysis.

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1. EXECUTIVE SUMMARY

1.1 KEY FINDINGS – HISTORIC FUNDING SCENARIO

The CY09 update of the *Economic Development Benefit Impacts from Focus on Energy Program* measures the economic return to Wisconsin's economy in terms of impacts on jobs, labor income, sales, and gross state product (GSP or value-added). Data describing actual and projected outcomes from the program's three portfolios—Business, Residential, and Renewables—were based on 10 program years and another 15 years to capture remaining energy savings persistence. For the Historical scenario, the program years span 2002 through 2011, while the Forward-looking scenario has program years from 2012 through 2021. Starting in 2007, annual Focus funding levels are set at 1.2 percent of utility operating revenues. Without consideration of Focus induced *market effects,* the results for the Historical scenario include:

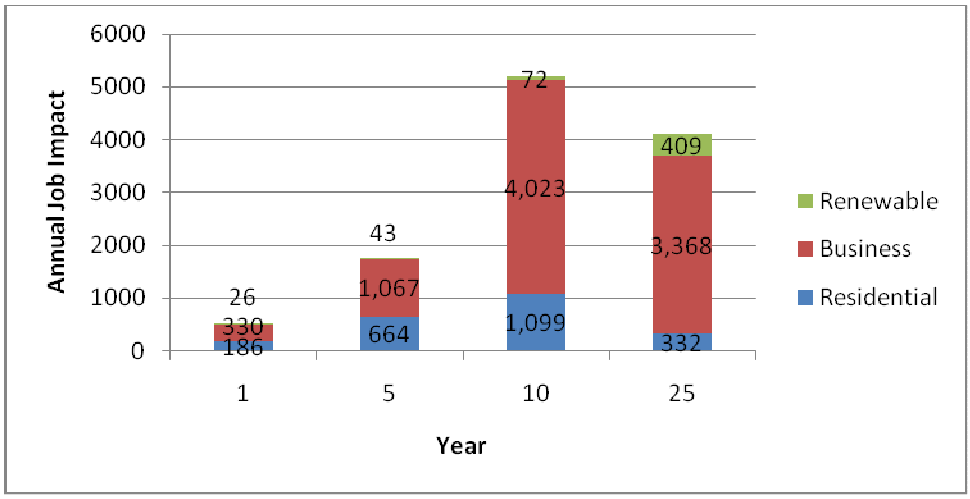
- **Job-impacts (*cumulative)*:** through the first 10 years of Focus 24,679 job-years, and 91,741 job-years when extended through 2026. A *job-year* defines one job for one year[1]
- **Extra disposable labor income:** $1.09b through the first 10 years and $5.66b through 2026
- **Additional activity for Wisconsin business:** $1.9b in extra sales through the first 10 years (approximately 75 percent is GSP), and by 2026 added sales of $12.21b (approximately 70 percent as GSP).

The inclusion of *market effects* increases the economic impacts through 2026 by approximately 10 percent.

The role of Focus programs in generating positive annual job impacts for Wisconsin, *over and above the annual jobs that would exist without Focus*, differs by portfolio, and the change in annual impacts shown for select years reflects the evolution of portfolio funding levels, customer participation, measure mix, and required investment to adopt energy-efficient components. A snapshot of annual job impacts is shown below.

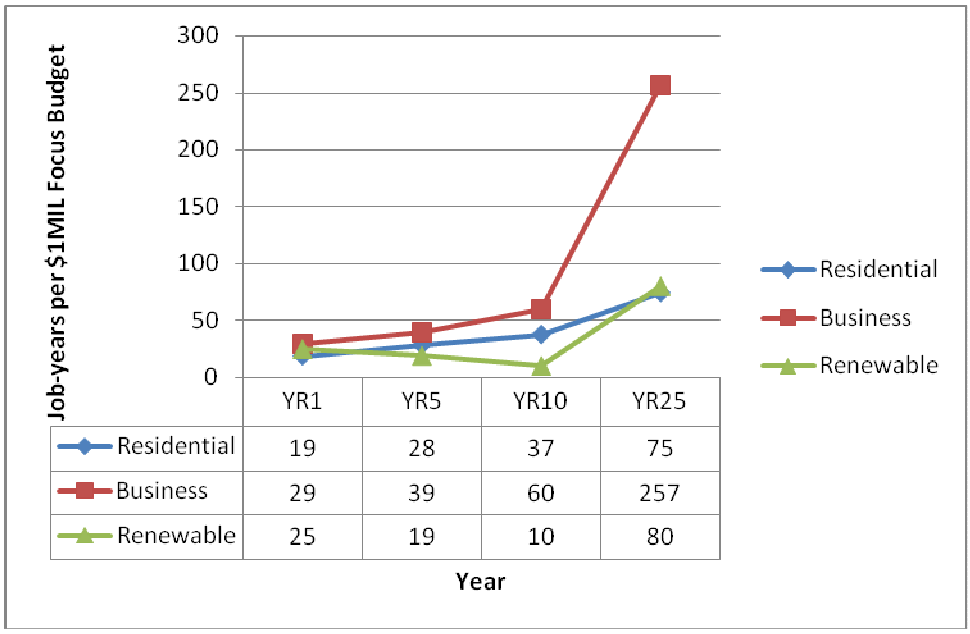
[1] The number of job-years likely represents a mix of job impacts that are *temporary* (lasting 1 to several years) or enduring (for the majority of the analysis interval) depending on the impetus that requires a particular job (e.g. a temporary job stimulated by putting capital in place *vs* a job created out of a lasting competitiveness benefit to a region's business(es).

Figure 1-1. Annual Job Impacts



The *cumulative* job-year impacts at the portfolio level expressed as *per $1million of Focus funding* are as follows:

Figure 1-2. Job-year Impacts at the Portfolio Level



	YR1	YR5	YR10	YR25
Residential	19	28	37	75
Business	29	39	60	257
Renewable	25	19	10	80

The large rate of increase in measured job-year impacts can be explained by the end of Focus funding after year 10, and the positive role that energy savings persistence exerts on the Wisconsin businesses through the 25th year.

Energy-efficiency programs like Focus are consistent with many of the "green job" objectives policy makers around the country are embracing. Focus is associated with direct jobs that administer/supply/deliver completed energy conserving projects and therefore qualify as

"green" in their outcomes. These "green" jobs are embedded in the above total job impacts created across Wisconsin. The "green" job representation in Focus' YR10 activities is as follows:

Table 1-1. "Green Job" Representation

Green Job Function	Quantity
Wisconsin-manufactured EE components	193
Program administration	579
Sales/distribution/installation of green components	941
Focus' Green Jobs "direct job effects"	**1,713**

This subset of total job impacts (33 percent of the 5,194 YR 10 total job impacts) come from specific segments of the Wisconsin economy, spanning the public/private sectors, the for-profit and not-for profit establishments, and manufacturers, professional/technical services, and sales channels at the wholesale and retail levels.

2. INTRODUCTION

This section discusses the (1) goals of this report, (2) types of programs covered, (3) ways in which economic development impacts occur, (4) how economic development impacts differ from other types of impacts, (5) steps in the analysis process, and (6) why some programs are designed to provide greater economic development impacts than others.

2.1 BACKGROUND

Report objective. This report describes the nature and magnitude of economic development impacts of the program—tracing changes in the flow of income and spending caused by the program and showing how the program causes both direct and indirect effects on the flow of money in the Wisconsin economy, as well as effects on the state's economic competitiveness for business attraction. The primary objective of economic development is to increase job opportunities and income levels, as part of a broader effort to improve the lives of Wisconsin residents by expanding and diversifying the state's economic base. These are measured since economic benefits are called out as an important secondary outcome of pursuing energy-efficiency policy in Wisconsin. In this report, we measure economic development impacts through four alternative views—business sales, gross regional product, jobs, and personal income. The report examines the size of these impacts, their timing, and their characteristics.

Program background. Focus was initiated in April 2001 as a set of "Public Benefits" energy programs, designed to encourage residential and businesses customers and local governments to take advantage of available energy technologies and make more economically efficient (and environmentally-responsible) energy decisions. They were also designed to promote lasting changes in energy and equipment market supply/demand patterns by (a) reducing existing barriers to adoption of economically efficient (and environmentally-responsible) energy products and services, and (b) encouraging the development of new market structures and entities to support those efforts. Focus was designed to produce both short-term and long-term economic benefits for Wisconsin residents and businesses. In the short term, it has participating customers gaining the energy benefits from purchasing more energy-efficient equipment: reduced energy usage, reduced energy bills, and increased income to spend on other needs. Installing more energy-efficient equipment of all kinds, from light bulbs to refrigerators to industrial motors, also reduces the demand for electricity generated in the state during the peak hours of the day and thus adds to the system's reliability (while also helping to avoid price spikes that have plagued Midwest utilities in recent years). In the long term, Focus was designed to help transform Wisconsin's energy efficiency and renewable energy markets, so that all Wisconsin energy consumers (regardless of participation) would eventually realize benefits from a marketplace where the basic level of energy efficiency in all kinds of energy-using devices is greater than would otherwise be the case.

The current policy objectives of Focus, as articulated in the PSCW SEA 2012 planning document, include:

1. Reduce energy demand (increased energy efficiency; increase conservation)
2. Add environmentally-sustainable energy alternatives
3. Environmental benefits (climate change driven targets)

4. Energy independence
5. Education and training
6. Market transformation (overcome market barriers to increased energy efficiency)
7. System reliability (electricity generation, transmission, and distribution in the state; rate stability electric and gas markets).

Given these policy objectives, there are clearly many types of program benefits that need to be assessed: improvements in energy efficiency and total energy consumption; improved air quality resulting from decreased electricity generation; improved health and quality of life; and, improvements in Wisconsin's economy from the activities generated by the program. Each of these areas is being addressed as part of the overall evaluation of Focus. This report focuses solely on economic development impacts.

2.2 TYPES OF ECONOMIC DEVELOPMENT IMPACTS

Focus directly affects Wisconsin's economy, and thus the income and jobs of Wisconsin residents, in four primary ways:

1. **Enhanced business competitiveness.** Decreasing energy costs through increased efficiency, conservation, and lower emission compliance costs can make business operations more profitable. By lowering costs of doing business, it also makes Wisconsin a more competitive location for additional business attraction, investment, and expansion. There is also a benefit (unmeasured to date and not part of this analysis) for Wisconsin firms that sell energy efficient products or include them in their services (as with construction contractors).
2. **Improved cost of living.** Decreasing electric and gas energy costs for residential customers, through increased efficiency, conservation and reduced emission compliance costs, can also leave more money in families' pockets (to spend on other discretionary purchases). Lowering the cost of living means that Wisconsin offers higher potential "real" income. This is not only attractive to the state's current residents, but also makes Wisconsin a more attractive place to live and work to people who offer skills the state economy needs in order to grow and expand.
3. **"Import substitution."** Focus also encourages more spending dollars to stay within Wisconsin. Wisconsin businesses are major manufacturers of heating and air conditioning equipment, motors, and controls. Focus stimulates sales for these industries in Wisconsin, as well as the development of solar, wind, and biomass energy production within the state. At the same time, the program has the effect of stopping *economic leakage* that occurs when money flows out-of-state to purchase coal and natural gas. These effects combine to stimulate job creation, increase personal income, and overall make the Wisconsin economy more efficient and competitive.
4. **Spin-off spending changes.** There are also various indirect and induced impacts that cause both positive and negative changes in spending. Suppliers to the directly affected businesses (as participants or as manufacturers, retailers, or installers of energy-efficient equipment) can realize increased orders for their products and services. Additional jobs and their associated worker income can

mean more re-spending of that income on consumer purchases. On the other hand, reductions in the growth of demand for traditional energy sources can mean less growth (or actual reductions) in business sales and jobs associated with construction and operation of coal-fired power plants and retail sales from those plants.

The report covers all aspects of changes in the economy and describes the types of jobs and industries where jobs are gained as well as lost due to Focus programs. We refer to the sum of all of the above-cited effects as "economic development" impacts because they reflect changes in the growth and development of the state's economy (i.e., the flow of money into, out of, and within the state affecting jobs and income for Wisconsin residents).

2.3 DISTINGUISHING ECONOMIC DEVELOPMENT FROM OTHER IMPACTS

Some aspects of energy, environmental, and other non-energy impacts can cause changes in the flow of dollars as measured in this report. There are, however, other aspects of those impacts that are *not* reflected in the analysis of economic development impacts in this report. They include some aspects of safety, security, reliability, health, and other aspects of quality of life—which either lack estimates of how they affect the economy or have policy importance beyond their mere effect on the flow of dollars.

It is also important to distinguish the analysis of economic development impacts from a traditional benefit-cost analysis. Both consider the benefits of cost savings for households and businesses. Economic development impact analysis, however, considers only affects on the actual flow of dollars, while benefit-cost analysis can also include non-money benefits that can be put into dollar terms (based on willingness-to-pay studies), such as environmental benefits and some non-energy benefits. On the other hand, a traditional benefit-cost study does not encompass impacts on economic competitiveness, on economic diversification, or on reducing the outflow of dollars from the state by increasing use of Wisconsin-made products and services. An economic development impact analysis can consider all of these other types of impacts. Finally, a benefit-cost study considers program spending as a cost that is subtracted from program benefits, while an economic development impact analysis traces how program spending can also be a source of additional business growth.

There has been an evolution of the benefit-cost approaches captured in the separate evaluation reports. The 2003 benefit-cost analysis[2] included benefits of energy savings, reduced emissions, market effects, non-energy benefits (NEBs), and net economic impacts (both positive and negative). The economic cost savings for participants took into account the subsidies received by participants along with the additional spending by participants (to qualify for those subsidies). The total of all of these net benefits were compared to total program costs, which were calculated as total program spending including subsidies. This effectively represents a perspective for government program funding decisions, in which net benefits are compared to the government costs of program alternatives.

[2] Miriam L. Goldberg, Valy Goepfrich, Lori Boeckeler, and G. Kennedy Andrews, KEMA-XENERGY Inc. *Focus on Energy Evaluation. Initial Benefit-Cost Analysis.* March 31, 2003.

The FY07 benefit-cost evaluation report[3] not only included the 2003 specification but also included an additional "robust" benefit-cost calculation. This alternative definition took on a societal perspective for calculating benefits and costs. In the formulation, benefits included only incremental energy savings, reduced emissions, and the monetized non-energy benefits, while costs include not only program costs but also participant spending.

2.4 STEPS IN THE ANALYSIS PROCESS

There are three steps in the process of analyzing the economic development impacts of the Focus programs. These steps are briefly summarized below, while a more detailed explanation of this methodology is provided in Appendix A.

1. Document direct effects. The first step is to track the net *direct effects* of the program. These are net changes in:

1. Program operations spending—in this case "ratepayer" dollars are spent in operating the program and paying incentives to business and household participants.
2. Household and business savings—these are dollar savings to businesses and households (resulting from reductions in energy and electric demand), realized because of the existence of the program.
3. Household and business cost—these are the additional household and business expenditures associated with the incremental cost of purchasing energy-efficient equipment. Incremental defines the cost difference when compared to purchasing a traditional energy-consuming component (the baseline assumption). Incentive dollars from (1) program operations spending work to defray these incremental costs.
4. Other spending shifts—shifts in patterns of spending and business sales among sectors of the state economy—affecting the flow of dollars into, out of, and within the state.
5. We rely on other program evaluation reports to obtain the basic information for these four types of direct economic impacts. A key element of this process is careful attention to establishing the net change in spending and costs incurred by government, households, and businesses compared to what would otherwise be expected to occur without the program. In general, the representation of program cost, participation, and energy impacts in this report builds upon program evaluation studies that are described in more detail in other reports.

2. Apply the economic model. The second step is to apply the REMI economic model of the state of Wisconsin. The model is a tool used to trace how the direct Focus program effects lead to changes in household and business costs, spending and sales patterns throughout the state's economy. As illustrated in Figure 2-1 below, we apply the inputs from step 1 to the REMI economic model to track a series of shifts in the state economy, including:

[3] Miriam L. Godlberg, Chris Clark, and Sander Cohan, KEMA, Inc. *Focus on Energy Evaluation. Interim Benefit-Cost Analysis: FY07 Evaluation Report.* February 26, 2007.

1. Lower business operating costs related to energy consumption (increased competitiveness for business attraction)

2. Lower household living costs (increased attraction as a place to live)

3. Import-substitution (Wisconsin-made products substitute for purchases of out-of-state equipment and fuels)

4. Increased orders for firms supplying goods and services to equipment manufacturers and installers in Wisconsin (indirect effect)

5. Re-spending of additional worker income within Wisconsin (induced effect).

The results of the REMI model represent changes in the economy of the state, on a year-by-year basis. The key indicators of change in the state's economy are:

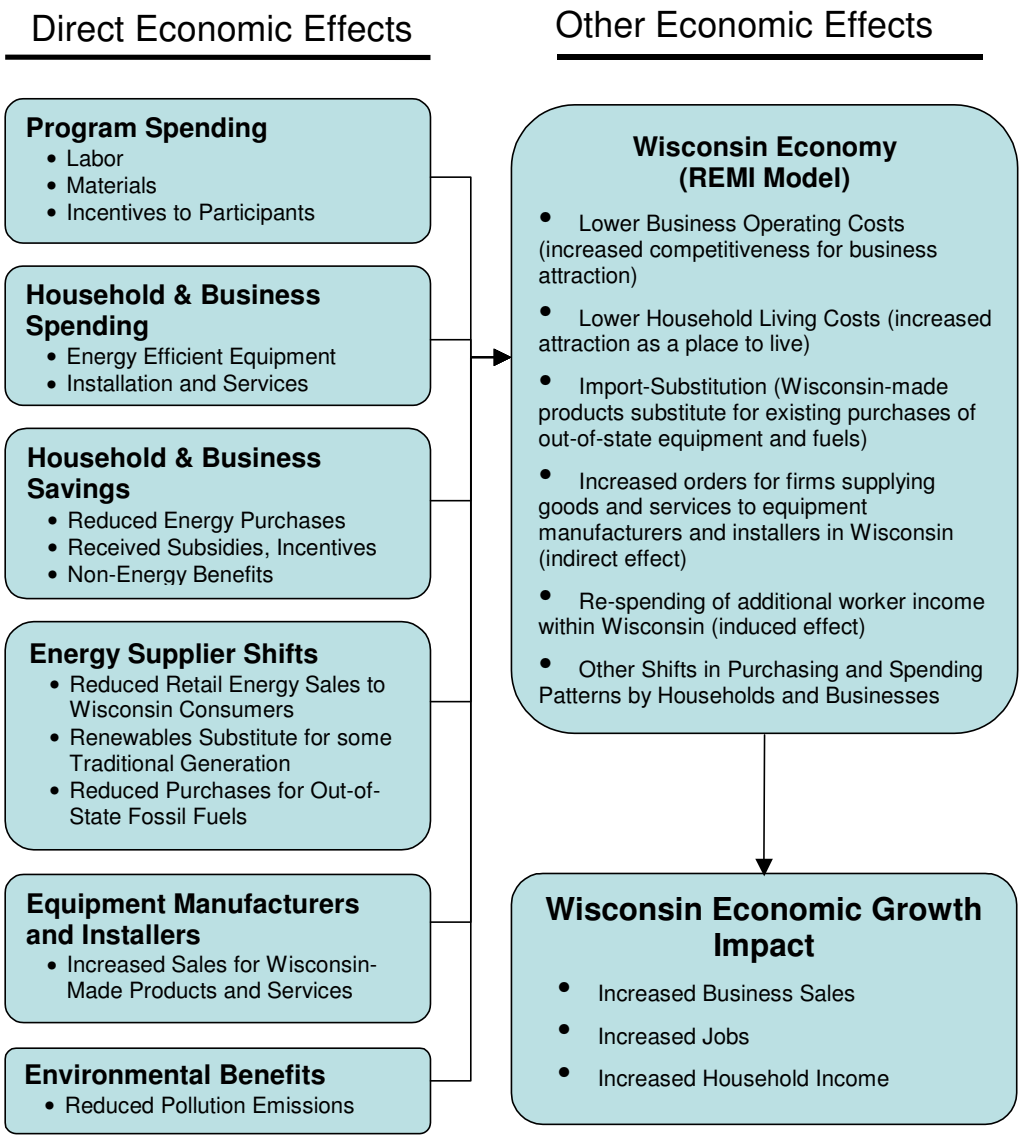
1. Total volume of business sales—by type of business

2. Total number of jobs associated with the change in business sales—by type of business and occupation category

3. Total *real* disposable income associated with (i) the program-generated savings experienced by households and (ii) more people working in Wisconsin due to the program's business competitiveness benefits

4. Total gross regional product—the change in "value added" that is generated in Wisconsin, which is essentially the sum of personal income and corporate income (profit).

Figure 2-1. Key Elements of Focus' Economic Development Impact



Source: EDR Group Renewables-Efficiency Economic Modeling (REEM)

3. Analyze economic development implications. The third and final step in the analysis process is to apply results of the economic model (step 2) to assess how the forecast program impacts translate into economic development changes. These include:

1. Changes in the growth and mix of jobs for Wisconsin residents in terms of industries and occupations. These can lead to increased diversification of the economy, increased opportunities for job skills, and higher income levels for Wisconsin workers.
2. Changes in the incidence of economic impacts, in terms of urban and rural locations.

3. Shifts in the nature and size of impacts occurring over time.
4. Shifts in the economic competitiveness and attractiveness of Wisconsin as a place to live and to locate a business.

2.5 ROLES OF DIFFERENT PROGRAM ELEMENTS

It is important to recognize that Focus actually encompasses three types of portfolios, each of which has very different forms of economic impacts.

- The core Business portfolio and Residential portfolio are each designed to achieve energy efficiency through the purchase of more energy efficient equipment. As such, they encourage households and businesses to spend money on purchases of such equipment in cases where the households and businesses will subsequently receive even greater cost-savings benefits from reduced energy use over time.

In addition, Focus includes a Renewable portfolio that is designed to provide benefits other than energy cost savings. This portfolio will soon be offered as a component within the Residential and Business portfolios.

- The Focus Renewable Energy portfolio is intended to stimulate customer-sited production of electricity in Wisconsin using non-fossil fuel sources. The Renewable portfolio does *not* reduce energy used but instead substitutes new forms of in-state electricity generation. The in-state generation can reduce the outflow of money from the state that energy-consumers expend for fuel inputs, many of them imported (e.g., coal and natural gas) and potentially increase electric system reliability. Some forms of renewable generation also add a benefit of decreased emissions. Biomass generation does produce emissions but has the added benefit of using in-state resources (farm waste, wastewater products) that would otherwise cost farms to comply with waste regulations from the Department of Natural Resources.

  The *Renewable portfolio* does not produce as strong economic impacts compared to the energy-efficiency portfolios of Focus since it is a smaller portfolio. It is noteworthy, however that other states operate such programs (formal Renewable Portfolio Standards) through ratepayers' public benefits funds and on the wholesale level, most states that have restructured their electric utility industries have specified that utilities include increasing percentages of electricity generated with renewable resources in their electric portfolios. Wisconsin's utility sector, though not restructured, has a similarly functioning RPS in place.

All of these elements of Focus have some effects on the economy, either by shifting purchasing patterns, saving energy, or providing for other non-energy economic benefits. Thus, we apply the same economic analysis framework (discussed in Appendix A, section A.2) for all elements of the program. However, we note that those program elements that are specifically designed to save money naturally emerge with the greatest magnitude of economic benefits, while programs with broader aims than just energy cost reductions are less likely to show overwhelming economic benefits because part of their justification is beyond the current measurement of impacts on the economy.

3. OVERALL FINDINGS—IMPACTS OVER TIME

This section provides an overall summary of the economic development impacts, based on completion of the first five years of Focus implementation, from 2002 through first half of 2009, and projections of program activity over subsequent years. It also discusses how economic development impacts evolve over time. (Further presentations of impacts by portfolio, impacts by industry, by occupation, and the geographic dispersion of direct *Focus* drivers follow later in Sections 4, 5, 6, and 7.)

3.1 SHIFTS OVER TIME

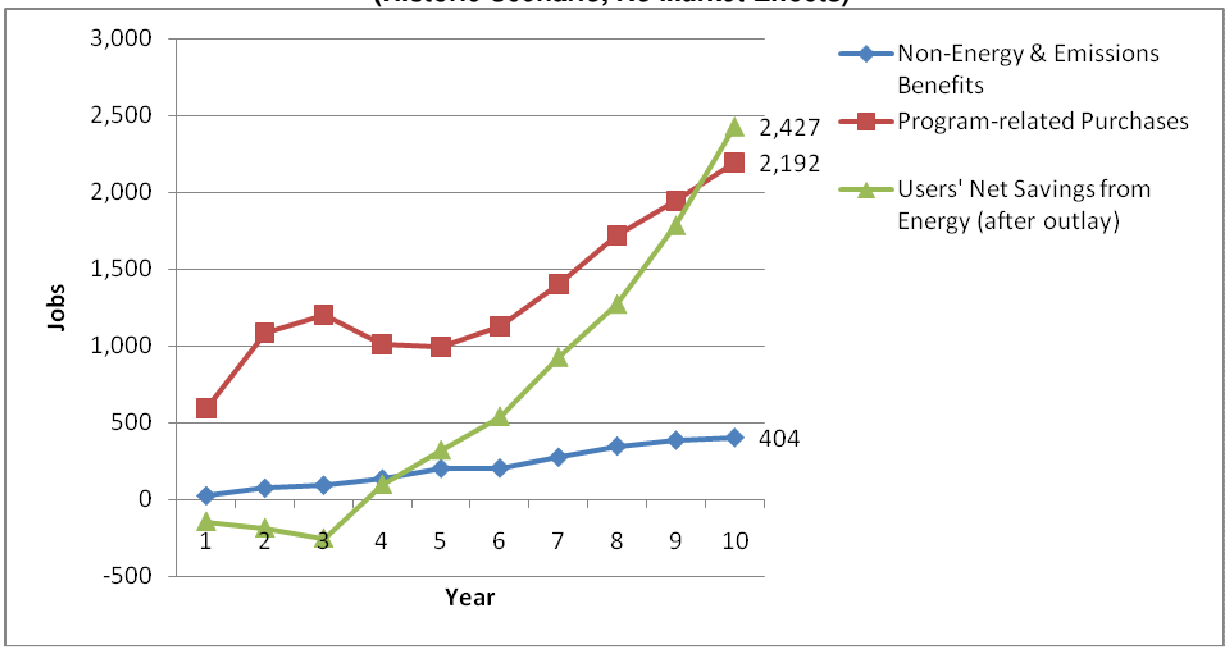
Through the analysis process that was previously described, the REMI economic model generated estimates of the current and projected future economic impacts from Focus. Since a key feature of Focus programs is energy cost savings for households and businesses, and since those savings continue over the lifetime of installed equipment, it is necessary to measure economic impacts over a period of time.

Figure 3-1 illustrates the Wisconsin job impacts that result over time from the combined Focus programs—Residential, Renewable, and Business Programs. The impacts result from the three key direct effects that emanate from Focus. The graphic illustrates a number of changes over time:

- Job creation associated with *user cost savings* tends to grow over time. In the first three years (actual experience), the net user savings are negative which reflects at the program level that (a) participants incur more of their spending for energy-efficient improvements than the value of realized energy savings and that reflects and (b) initial year funding changes, program mixes and their associated participation rates. From year four to year ten, however, a “straight line” pattern of growth in job impact results. This is largely due to the accumulated growth in overall savings, as early year participants continue to receive cost savings in future years (until the end of the useful life of the equipment or the end of its active use occurs).
- Job creation attributable to *non-energy benefits and pollution emissions reduction* grows over time as the associated household cost savings and utility emissions-related cost savings accumulate over time.
- Job creation associated with *program spending effects* moderates after the third year, as program spending is reduced and by the seventh year program spending impacts exceed those in year three. Despite variations in the rate of positive job impacts, job creation continues insofar as the program spending continues to increase sales for Wisconsin-based businesses that are producers, assemblers, suppliers, or installers of energy-saving (or energy generating) equipment. This is known as “import substitution,” as it keeps more spending circulating among Wisconsin-based businesses rather than “leaking” out of state to purchase electricity, natural gas, or coal from outside suppliers.

Further breakdowns of impacts by causal factor are provided in Appendix A.

Figure 3-1. Employment Impact over Time, by Cause, All Focus Programs (Historic Scenario, No Market Effects)



Source: REMI model runs by Economic Development Research Group

3.2 IMPACT DIFFERENCES AMONG FOCUS SCENARIOS

Tables 3-1a and 3-1b show the projected annual economic impacts from Focus programs in aggregate for selected years and periods. These results reflect new estimates developed on the basis of a new version of the statewide economic model and an updated procedure for measuring job impacts. Two scenarios condition our economic benefit impact assessment:

- The historic scenario assumes that Focus will fund and manage the programs for ten years beginning in 2001. The total impact of the programs is measured for an additional 15 years after funding ends (2026).
- A forward-looking scenario, assumes that the future Focus programs follow the savings trends projected in the ECW Potential Report.[4] In this scenario, the programs are funded for ten years beginning in 2012. The total impact of the programs is measured for an additional 15 years after funding ends (2036).

The results are presented in terms of (1) the number of job years created for Wisconsin residents, (2) the sales generated for Wisconsin businesses, (3) the value added portion of those sales, and (4) disposable income generated for Wisconsin residents. The tables also summarize impacts when both the Residential and Business programs include expected "market effects" beyond what the program instigates in terms of increases in household and

[4] As described in the *Benefit-cost Analysis CY09 Evaluation Report* Final: November 24, 2009, on page 5-2 "ECW based the program costs on net savings values. Since the program incurs costs for all participants, this approach underestimates both administrative and incentive costs. For this…analysis, we adjusted the ECW program costs to account for program attribution."

business purchases of energy efficient products, adoption of energy efficient practices, and the ensuing energy savings. These are effects in the economy that are realized without formal program participation. A similar set of economic impact results are shown for the *forward-looking* funding stance for Focus starting in 2012 and those effects were stated as *net effects* presumably inclusive of free-ridership adjustments and a market effect component – though not explicitly broken out.

Tables 3-1a and 3-1b. Economic Development Impacts for all Focus Programs, Historic and Forward-looking Funding Scenarios

Historic Trend Scenario* (mil $2009)	Year 1	Year 5	Year 10	Sum 10 Years	Sum 25 Years
Impact without Market Effects					
Jobs (job years for sums)	542	1,774	5,194	24,679	91,741
Sales generated	$29	$120	$466	$1,907	$12,209
GRP (value-added)	$25	$91	$343	$1,428	$8,577
Disposable income	$18	$72	$258	$1,090	$5,658
Impact with Market Effects					
Jobs (job years for sums)	545	1,782	5,204	24,897	100,356
Sales generated	$29	$121	$472	$1,915	$13,522
GRP (value-added)	$25	$91	$346	$1,435	$9,450
Disposable income	$18	$72	$262	$1,096	$6,234

Forward-looking Scenario* (mil $2009)	Year FL1	Year FL5	Year FL10	Sum 10 Years	Sum 25 Years
Impact without Market Effects					
Jobs (job years for sums)	11,813	22,610	33,304	232,826	555,357
Sales generated	$923	$2,306	$4,018	$24,746	$75,384
GRP (value-added)	$637	$1,547	$2,669	$16,559	$50,442
Disposable income	$522	$1,163	$1,932	$12,355	$35,949

*FL1 = 2012, FL5 = 2016, FL10 = 2021

Source: REMI model runs by Economic Development Research Group

3.3 OVERALL CHANGE

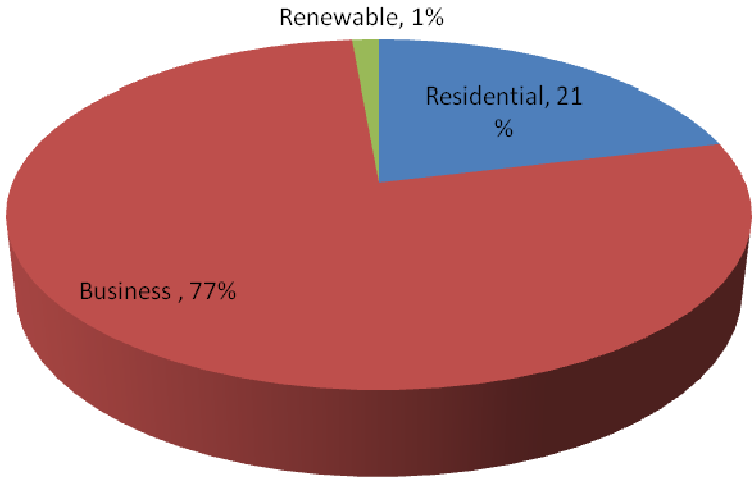
Altogether, the analysis confirms that Focus leads to significant economic development benefits for Wisconsin's economy. Even without counting market effects, the first year of program operation causes a variety of household and business cost savings and spending changes that altogether support 542 jobs in the state and that impact grows to at least 1,774 jobs by the fifth year of program operation. The personal income generated in Wisconsin from this additional business activity represents $18 million in the first year and grows to $72 million by the fifth year of program operation. The market effects also grow over time, adding a small impact in the first five years, but then adding roughly 9.4 percent to jobs and income respectively over the projects' assumed 25-year analysis interval.

Further breakdowns of economic development impacts are shown by portfolio in Section 3, by industry sector in Section 4, and by occupation in Section 5.

4. IMPACTS BY PORTFOLIO

This section builds upon the overall summary (in Section 3) to provide a breakout of economic development impacts in terms of three Focus portfolio categories: (1) business segments, (2) residential segment, and (3) renewable generation. Figure 4-1 summarizes the overall contribution of each portfolio category to overall job creation impacts for year ten (excluding market effects).

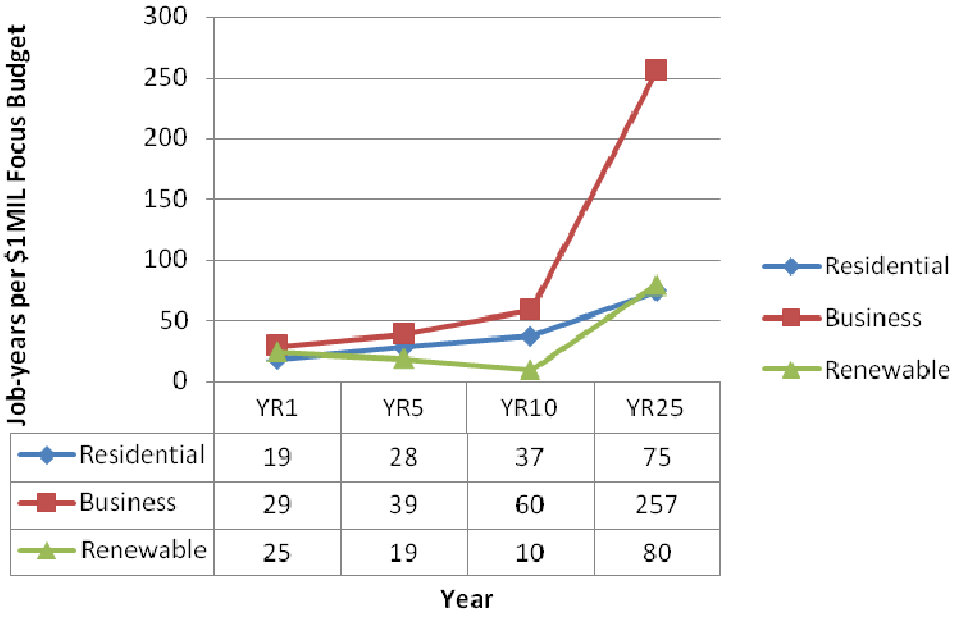
Figure 4-1. Ten-Year Job Creation Impacts: Breakout by Portfolio Type (Historic Scenario)



Source: REMI model runs by Economic Development Research Group

Figure 4-2 shows each portfolio's propensity to support Wisconsin jobs (shown as job-years) per $1 million of portfolio funding for the analysis interval. The large rate of increase in measured job-year impacts can be explained by the end of Focus funding after year ten, and the positive role that energy savings persistence exerts on the Wisconsin businesses through the 25th year.

Figure 4-2. Focus Funding and Job Impact Generation



	YR1	YR5	YR10	YR25
Residential	19	28	37	75
Business	29	39	60	257
Renewable	25	19	10	80

4.1 BUSINESS PORTFOLIO

The Business portfolio delivers programs that promote energy efficient equipment and practices to industrial, commercial, agriculture, and government sectors. Since Focus' launch, these programs have changed in adopting a more technology-specific focus and have within the past two years reinstated a construction-sector program. Tables 4-1a and 4-1b show a summary of the business portfolio's spending and energy impacts for Historic and Forward-looking funding scenarios.

Tables 4-1a and 4-1b. Business Programs: Spending and Energy Impacts, Historic Trend and Forward-looking Funding Scenarios – No Market Effects

Historic Trend Scenario No Market Effects ($ mil, 2009 basis)	Year 1	Year 5	Year 10
$ Budget (including Incentive payments)	$11.38	$17.31	$52.38
$ Participant net incremental cost after incentives	$6.43	$19.41	$39.47
$ Direct energy savings (cumulative)	$1.75	$40.82	$172.46
kWh saved (cumulative)	15,962,557	324,552,178	1,390,358,113
Therms saved (cumulative)	846,546	25,001,884	95,994,905

Forward-looking Scenario No Market Effects ($ mil, 2009 basis)	Year FL1	Year FL5	Year FL10
$ Budget (including Incentive payments)	$511.20	$413.10	$290.90
$ Participant net incremental cost after incentives	($185.50)	($146.00)	($96.70)
$ Direct energy savings (cumulative)	$111.80	$486.00	$797.80
kWh saved (cumulative)	996,562,536	4,303,023,884	7,295,443,733
Therms saved (cumulative)	33,729,095	149,425,058	250,866,320

Source: KEMA 2009

Note: Year FL1=2012, FL5=2016, FL10=2021

Tables 4-2a and 4-2b summarize the projected economic development impacts of the Business portfolio over a ten-year period as well as over the 25-year analysis interval. The Historic funding scenario is examined with and without expected market effects (i.e., market effects as the additional impacts from nonparticipants). The total economic impacts under the Historic funding scenario *with market effects* should be, and are, slightly more pronounced than *without additional market effects*. In recent years, evaluation research for Focus has reflected increased allocations of resources to examining market effects. These efforts have continued to identify new untracked savings.

Tables 4-2a and 4-2b. Business Portfolio: Economic Impacts, for Historic and Forward-looking Scenarios

Historic Trend Scenario* ($ mil, 2009 basis)	Year 1	Year 5	Year 10	Sum 10 Years	Sum 25 Years
Impact without Market Effects					
Jobs (job years for sums)	330	1,067	4,023	17,201	74,208
Sales generated	$14	$75	$380	$1,398	$10,451
GRP (value-added)	$13	$60	$297	$1,118	$7,283
Disposable income	$11	$48	$214	$831	$4,832
Impact with Market Effects					
Jobs (job years for sums)	330	1,067	4,029	17,341	81,790
Sales generated	$14	$75	$385	$1,399	$11,660
GRP (value-added)	$13	$60	$300	$1,120	$8,084
Disposable income	$11	$48	$218	$836	$5,363

Forward-looking Scenario* ($ mil, 2009 basis)	Year FL1	Year FL5	Year FL10	Sum 10 Years	Sum 25 Years
Impact without Market Effects					
Jobs (job years for sums)	8,574	16,177	22,784	164,477	423,201
Sales generated	$684	$1,767	$3,031	$18,834	$62,029
GRP (value-added)	$488	$1,196	$1,992	$12,645	$40,256
Disposable Income	$417	$926	$1,477	$9,702	$29,289

* FL 1 = 2012, FL 5 = 2016, FL 10 = 2021

Source: REMI model runs by Economic Development Research Group

4.2 RESIDENTIAL PORTFOLIO

Focus uses seven programs to target the Residential sector and associated markets. The residential programs offered by Wisconsin Energy Conservation Corporation (WECC) and their subcontractors are quite diverse. Some are similar to programs that have been offered in Wisconsin for many years (e.g., the ENERGY STAR Products program which evolved from lighting and appliance campaigns from the mid-90s and mirrors Wisconsin's longstanding statewide Low-income Weatherization Assistance program). Others are newer (e.g., Home Performance with ENERGY STAR for the retrofit market). Tables 4-3a and 4-3b summarize the residential portfolio spending and energy impacts for Historic funding and Forward-looking funding scenarios. These are the *direct* effects from Focus programs that support the economic impact consequences shown in Tables 4-4a and 4-4b.

Tables 4-3a and 4-3b. Residential Portfolio: Spending and Energy Impacts, Historic and Forward-looking Funding Scenarios – No Market Effects

Historic Trend Scenario No Market Effects ($ mil, 2009 basis)	Year 1	Year 5	Year 10
$ Budget (including incentive payments)	$9.99	$16.71	$22.80
$ Participant net incremental cost after incentives	$12.33	$30.48	$36.21
$ Direct energy savings (cumulative)	$2.04	$26.31	$57.68
kWh saved (cumulative)	21,906,968	324,623,219	642,291,580
Therms saved (cumulative)	830,442	6,999,219	16,470,483

Forward-looking Scenario ($ mil, 2009 basis)	Year FL1	Year FL5	Year FL10
$ Budget (including incentive payments)	$166.0	$210.0	$268.0
$ Participant net incremental cost after incentives	$27.0	$31.7	$39.4
$ Direct energy savings (cumulative)	$21.7	$114.0	$254.3
kWh saved (cumulative)	229,650,629	1,173,165,848	2,492,143,666
Therms saved (cumulative)	3,300,874	22,779,233	59,450,369

Source: KEMA 2009

Note: Year FL1=2012, FL5=2016, FL10=2021

Participants in residential programs have additional "non-energy benefits," some of which represent real money. These range from increased sale value for ENERGY STAR homes standards to savings in lighting maintenance costs for fixtures with compact fluorescent bulbs.

Tables 4-4a and 4-4b summarize the projected economic development impacts of the Residential portfolio over a ten-year period. This includes effects of both cost savings and non-energy benefits, and it is shown both with and without expected market effects (i.e., additional impacts from nonparticipants). The total economic impacts under the Historic funding scenario *with market effects* should be, and are, slightly more pronounced than *without market effects*.

Tables 4-4a and 4-4b. Residential Portfolio: Economic Impacts, for Historic and Forward-looking Scenarios

Historic Trend Scenario ($ mil, 2009 basis)	Year 1	Year 5	Year 10	Sum 10 Years	Sum 25 Years
Impact without Market Effects					
Jobs (job years for sums)	186	664	1,099	7,037	14,001
Sales generated	$14	$43	$81	$486	$1,297
GRP (value-added)	$11	$30	$57	$341	$899
Disposable income	$6	$23	$43	$250	$609
Impact with Market Effects					
Jobs (job years for sums)	189	672	1,103	7,114	15,034
Sales generated	$14	$44	$81	$493	$1,402
GRP (value-added)	$11	$30	$57	$346	$970
Disposable income	$6	$23	$43	$251	$655

Forward-looking Scenario* ($ mil 2009 basis)	Year FL1	Year FL5	Year FL10	Sum 10 Years	Sum 25 Years
Impact without Market Effects					
Jobs (job years for sums)	2,842	4,723	6,747	48,695	82,053
Sales generated	$194	$372	$611	$3,967	$8,253
GRP (value-added)	$134	$257	$420	$2,740	$5,692
Disposable Income	$96	$185	$304	$1,975	$3,881

* FL1 = 2012, FL5 = 2016, FL10 = 2021

Source: REMI model runs by Economic Development Research Group

4.3 RENEWABLE ENERGY PROGRAM

The Renewable Energy program seeks to encourage households, farms, and businesses to install renewable energy systems that generate electricity or displace fossil fuel consumption. The program has supported photovoltaic installations, solar thermal- and wind-powered generators for homes and small businesses, and biogas digester systems for farm, institutional, and industrial settings. Many of the biogas systems generate electricity; some are used to provide methane gas for other purposes. In addition, the program has supported biomass combustion, in which waste biomass sources are burned as a source of space and process heating, and solar water heating systems at commercial properties. The program pays incentives based upon the number of kilowatt hours and/or therms expected to be produced per year and overall project size, up to a percentage and dollar limit of the total installed cost. In general, the program does not decrease total energy use, but provides the impetus for renewable fuels to substitute (at the participating home or business) for utility-generated electricity (most likely produced by burning coal or natural gas) or fossil fuels. Tables 4-5a and 4-5b summarize the Renewable Energy spending and energy impacts for program years one through ten. Market effects are currently not part of the renewables portfolio economic impact analysis. However, research on Renewable Energy market effects is underway (early 2010).

Tables 4-5a and 4-5b. Renewable Energy: Spending and Energy Impacts for Historic and Forward-looking Funding Scenarios

Historic Trend Scenario ($ mil, 2009 basis)	Year 1	Year 5	Year 10
$ Budget (including incentive payments)	$1.10	$2.31	$8.96
$ Participant net incremental cost after incentives	$0.00	$1.50	$12.60
$ Direct energy savings (cumulative)	$0.00	$0.90	$8.60
kWh saved (cumulative)	475	8,014,598	31,439,732
Therms saved (cumulative)	0	621,080	7,174,495

Forward-looking Scenario* ($ mil 2009 basis)	Year FL1	Year FL5	Year FL10
$ Budget (including incentive payments)	$50.2	$174.3	$329.5
$ Participant net incremental cost after incentives	$5.8	$45.6	$95.4
$ Direct energy savings (cumulative)	$5.6	$48.2	$150.5
kWh saved (cumulative)	35,942,799	306,031,732	927,857,805
Therms saved (cumulative)	1,692,148	9,895,385	23,377,383

Source: KEMA 2009

Note: Year FL1=2012, FL5=2016, FL10=2021

Tables 4-6a and 4-6b summarize projected economic development impacts for the Renewable portfolio. Initial positive employment and income impacts occur from small increases in local spending associated with installation of renewable generation equipment. With projected program growth over time (through year 25), the positive economic effect continues to grow modestly despite the fact there is no assumed growth of locally produced renewable generating equipment (a would-be *byproduct* of market effects), though the program is intended to help jump start that industry.

Tables 4-6a and 4-6b. Renewable Energy: Economic Impacts for Historic and Forward-looking Scenarios

Historic Trend Scenario (mil $2009)	Year 1	Year 5	Year 10	Sum 10 Years	Sum 25 Years
Impact without Market Effects					
Jobs (job years for sums)	26	43	72	441	3,531
Sales generated	$1	$2	$6	$23	$461
GRP (value-added)	$1	$0	-$11	-$31	$395
Disposable income	$1	$2	$1	$9	$217

Forward-looking Scenario* (mil $2009)	Year FL1	Year FL5	Year FL10	Sum 10 Years	Sum 25 Years
Impact without Market Effects					
Jobs (job years for sums)	397	1,710	3,773	19,654	50,103
Sales generated	$45	$167	$377	$1,945	$5,102
GRP (value-added)	$14	$93	$256	$1,174	$4,493
Disposable income	$9	$52	$152	$678	$2,779

*FL 1 = 2012, FL 5 = 2016, FL 10 = 2021

Note: Renewable Portfolio has no market effects

Source: REMI model runs by Economic Development Research Group

The results of segmenting the economic development impacts by portfolio serves to underscore a key point—that Focus encompasses a combination of programs, each of which has a unique combination of goals and capabilities for reducing current energy use, encouraging longer-term market changes, and/or addressing broader societal goals of encouraging clean fuels and distributed energy generation. As a result, the short-term and long-term economic development impacts of each portfolio follow a different pattern. Other reports in this series of evaluation studies examine portfolio-specific impacts from alternative perspectives.

5. IMPACTS BY ECONOMIC SECTOR

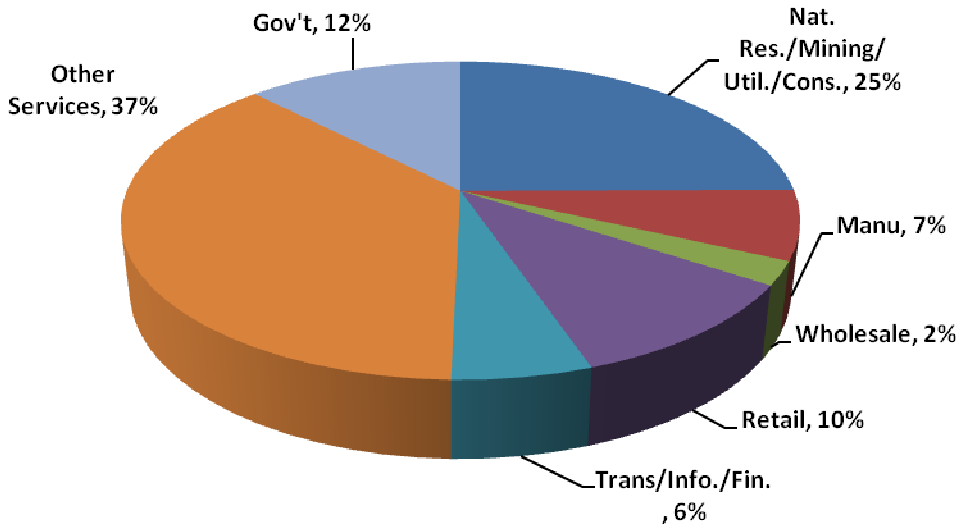
This section examines impacts in year ten from Focus programs in terms of helping to diversify Wisconsin's economic base. It also examines how these impacts are shaped by program design and implementation. The section is organized into two parts: (1) overall economic development effects on specific industries and (2) comparison of economic development impacts to current business patterns and expected future trends.

5.1 IMPACTS BY INDUSTRY

Figure 5-1 shows a breakdown of overall job impacts for major sectors of the economy. It shows that Focus programs provide widespread benefits among all sectors of the economy. There are several reasons for this result.

- While many of the business portfolio participants are manufacturing and commercial businesses, all of the portfolios create additional economic benefits by supporting manufacturers, wholesalers, retailers, engineering and installation services, and construction services associated with the energy-saving materials, equipment, and buildings.
- The growth of participating firms also leads to "indirect" growth impacts on other firms that supply goods and services to them.
- The growth of workers at both the directly affected businesses and the indirectly affected businesses leads to further "induced effects" as the additional worker income supports more household consumption.

Figure 5-1. Summary of Focus' Job Impacts by Industry, Year 10 (Historic Scenario)



Source: REMI model runs by Economic Development Research Group

Table 5-1 shows how the mix of impact among major sectors of the economy can be viewed differently in terms of business output (dollars of total sales) or in terms of jobs.

Table 5-1. Focus' Impacts on the Economy by Major Industry
(Tenth Year, Output in Constant 2009 Dollars)

Major Industry	Output Impacts (mil.)	Percentage of Output	Job Impact	Percentage of Jobs	
				Private Sector	All Jobs
Natural Resources/Mining/ Utilities/Construction	$43	9%	1,292	28%	25%
Manufacturing	$137	29%	366	8%	7%
Wholesale	$32	7%	124	3%	2%
Retail	$49	11%	542	12%	10%
Transportation/Info./Finance	$64	14%	291	6%	6%
Other services	$141	30%	1,937	43%	37%
Total private sector	**$466**	**100%**	**4,557**	**100%**	**88%**
Total all sectors			**5,194**		

Note: Job impacts show account for less than 100 percent of the total employment changes since state/local government job changes are not shown as major industry.

Source: REMI model runs by Economic Development Research Group

The key findings from this table are as follows:

- The *overall impact* of Focus is to make Wisconsin's total business output $466 million/year higher in the tenth year than would have occurred without the program. This growth involves an additional 4,557 private sector jobs and 5,194 total jobs.
- *Manufacturing* accounts for the largest share of the total statewide impact on output—29 percent, though only eight percent of the total private-sector job impact. The high impact on manufacturing output reflects the program impact on increasing the "cost competitiveness" of this sector as well as the redirection of some business and household purchases towards energy-efficient electrical equipment and machinery manufactured in Wisconsin. The smaller job impact is due to the fact that Wisconsin manufacturing has a high value of output per worker, known as high labor productivity.
- *Retail* accounts for 11 percent of the output impact and 12 percent of the private-sector employment impact. The effect on output is attributable to the large residential program, which causes participating households to experience an increase in their disposable income, which they then spending on retail, entertainment, and personal services, and to the fact that many of the residential programs direct households through retail channel to purchase energy-efficient appliances and lighting. The larger job impact is due to the high labor-intensity of retailing.
- *Services* accounts for 30 percent of the output impact and 43 percent of the employment impact. This classification includes energy-related services, which are supported by the business program's marketing and incentive features. The higher share of employment impact is due to the labor-intensive nature of most services.

- The pronounced percentage of job impacts occurring in the *Natural Resource /Mining /Utilities /Construction* category is primarily attributable to program-related installation demand for contractors to retrofit or install new equipment and systems.
- The additional impacts for the remaining sectors such as *Transportation*, *Construction*, *Finance,* and *Wholesale* is attributable to increased spending by both households (due to disposable income growth) and businesses (due to expansion of activity) and to the fact that firms from within these industries are participating in Focus' Business programs.

Table 5-2 shows a more detailed breakdown of the economic model results for year ten (2011) by industry. These are the same results as previously shown for Table 5-1, but with a much greater level of detail. For instance, the employment impact allocations shows that the most significant impacts (creating at least 70 jobs) occur for construction, HVAC machinery manufacturing, electrical controls manufacturing, wholesale, retail, and technical services—all involved with the delivery of Focus program projects. Other sectors showing considerable job creation (e.g., ambulatory health care, real estate, and administrative services) reflect other economic linkages (whether business-to-business or population changes as the state becomes more competitive) at work in the Wisconsin economy as captured in the REMI model.

Table 5-2. Focus' Impacts on the Economy by Detailed Industry (Tenth Year, Output in Constant 2009 Dollars)

Detailed Industry Sector	Output (mil.)	Jobs
Forestry and logging; Fishing, hunting, and trapping	$0.2	4
Agriculture and forestry support activities; Other	$0.9	57
Oil and gas extraction	$0.0	0
Mining (except oil and gas)	$0.1	1
Support activities for mining	$0.0	0
Utilities	$6.5	9
Construction	$35.2	1,220
Wood product manufacturing	$4.1	23
Nonmetallic mineral product manufacturing	$2.8	12
Primary metal manufacturing	$4.9	11
Fabricated metal product manufacturing	$10.0	43
Machinery manufacturing	$39.9	112
Computer and electronic product manufacturing	$11.6	10
Electrical equipment and appliance manufacturing	$7.2	17
Motor vehicles, bodies and trailers, and parts manufacturing	$6.8	9
Other transportation equipment manufacturing	$1.7	5
Furniture and related product manufacturing	$1.7	8
Miscellaneous manufacturing	$3.2	10
Food manufacturing	$14.3	33
Beverage and tobacco product manufacturing	$1.1	2
Textile mills	$0.2	1
Textile product mills	$0.5	2
Apparel manufacturing	$0.2	2

Detailed Industry Sector	Output (mil.)	Jobs
Leather and allied product manufacturing	$0.2	2
Paper manufacturing	$6.6	14
Printing and related support activities	$2.5	17
Petroleum and coal product manufacturing	$0.6	0
Chemical manufacturing	$8.6	12
Plastics and rubber product manufacturing	$8.5	25
Wholesale trade	$31.5	124
Retail trade	$49.3	542
Air transportation	$0.7	2
Rail transportation	$0.2	1
Water transportation	$0.0	0
Truck transportation; Couriers and messengers	$5.0	32
Transit and ground passenger transportation	$0.4	5
Pipeline transportation	$0.0	0
Scenic and sightseeing transportation; support activities	$0.1	1
Warehousing and storage	$0.5	7
Publishing industries, except Internet	$5.9	14
Motion picture and sound recording industries	$0.6	6
Internet publishing and broadcasting; ISPs, search portals, and data processing; Other information services	$3.8	10
Broadcasting, except Internet; Telecommunications	$5.9	12
Monetary authorities - central bank; Credit intermediation and related activities; Funds, trusts, and other financial vehicles	$21.9	98
Securities, commodity contracts, investments	$9.0	45
Insurance carriers and related activities	$10.5	58
Real estate	$28.6	137
Rental and leasing services; Lessors of nonfinancial intangible assets	$5.7	16
Professional and technical services	$17.5	555
Management of companies and enterprises	$7.9	26
Administrative and support services	$10.7	200
Waste management and remediation services	$1.2	8
Educational services	$1.7	40
Ambulatory health care services	$30.7	207
Hospitals	$7.8	71
Nursing and residential care facilities	$2.3	53
Social assistance	$2.1	66
Performing arts and spectator sports	$1.1	24
Museums, historical sites, zoos, and parks	$0.1	2
Amusement, gambling, and recreation	$2.5	42
Accommodation	$0.8	16
Food services and drinking places	$7.7	215
Repair and maintenance	$4.3	51
Personal and laundry services	$5.7	80
Membership associations and organizations	$2.0	55

Detailed Industry Sector	Output (mil.)	Jobs
Private households	$0.4	75
Total private sector	**$466**	**4,557**

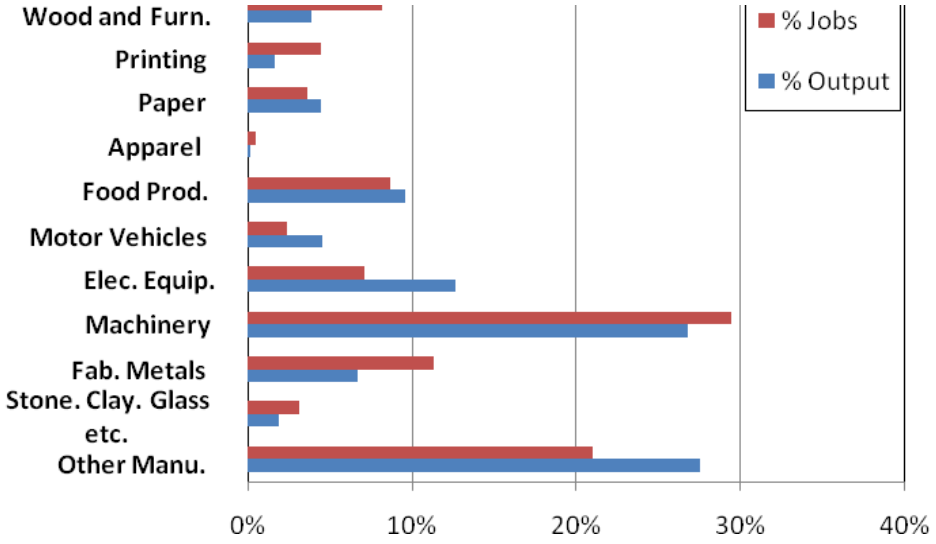
*Excludes Government and Farm jobs

Source: REMI model runs by Economic Development Research Group

A closer look at the impacts specifically occurring within Wisconsin's manufacturing sector, (Figure 5-2) illustrates how the distribution of impacts by industry varies by type of metric. This year ten snapshot of manufacturing impacts attributable to Focus depicts a time when (a) energy-efficient project investments are underway, and (b) Business portfolio participants already recoup energy savings despite making investments. Key findings are that:

- Whether based on job impact or output impact, *Machinery Mfg., Other Mfg.,* and *Electrical Equipment (and Appliance) Mfg* in Wisconsin incur the largest percentage growth. This is largely the result of (a) above and in some part attributable to (b).
- Note that for two of these three manufacturing activities (*Other Mfg. and Electrical Equipment Mfg*) the percentage of output growth exceeds its percentage of job growth, an indication of high labor productivity at work for these industries in Wisconsin. *Machinery Mfg* on the other hand is more labor intensive per dollar of output.
- The impacts shown for the remaining Wisconsin manufacturing industries (formally participating in the Business Programs) have positive but smaller percentage changes than for the three manufacturing activities highlighted above. This result is most likely due to the fact that these are more mature and stagnant (or declining) industries, which are losing market share to lower cost competition from abroad. As a result, the improvement in their operating costs in Wisconsin has a more muted impact on their overall competitiveness.
- Some portion of all the manufacturing industries resulting impacts emerge from the influence of households and businesses eventual energy purchases (e.g., either inter-industry linkages or linkages between industries and changes in household spending)

Figure 5-2. Allocation of Focus' Impacts across Wisconsin Manufacturing (Tenth Year)



Source: REMI model runs by Economic Development Research Group

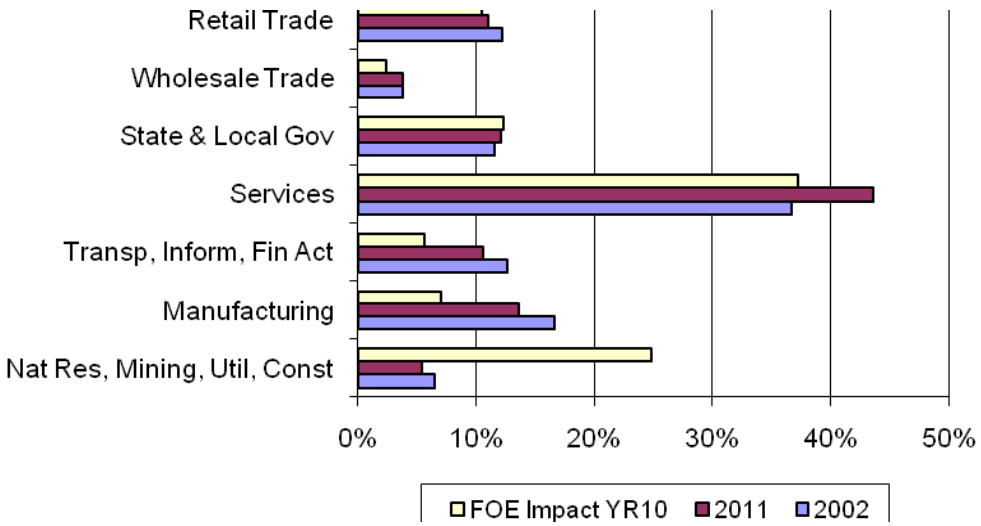
5.2 COMPARISON OF IMPACTS TO BASELINE TRENDS

To understand and interpret the industry mix of jobs supported by Focus programs, it is useful to compare (1) the Focus program year ten mix of the impacted jobs with (2) the state's job mix as of 2002 when Focus was first started and (3) projections of the state's job mix ten years later (as of 2011, not incorporating any impact of from Focus activities). The *baseline* economic assumptions for Wisconsin's economy are those assembled in the REMI Wisconsin modeled and used by other WI state agencies[5]. Figure 5-3 illustrates this comparison for major sectors of the economy. It shows that:

- The share of total *services* sector jobs in the general economy is expected to increase over the next ten years (2002–2011) from approximately 38 percent to 43 percent. Of the jobs that Focus will impact in 2011 *services* sector, jobs will represent about 38 percent, similar to the 2002 employment composition in Wisconsin.
- The share of Wisconsin's total jobs in the *retail* sector and the combined category containing the *construction* sector are expected to be generally stable over the next ten years. However, the share of total jobs impacted as a result of Focus created accounted for by construction trades (contractors) is larger than either current or projected patterns in the general economy. The *retail* sector share of impacted jobs is expected to be slightly less pronounced than the 2011 projection without the program.

[5] WI Department of Transportation, Department of Natural Resources.

Figure 5-3. Comparison of Focus Job Impacts with Baseline 2002 and Projected 2011 Job Profiles



Source: REMI model runs by Economic Development Research Group

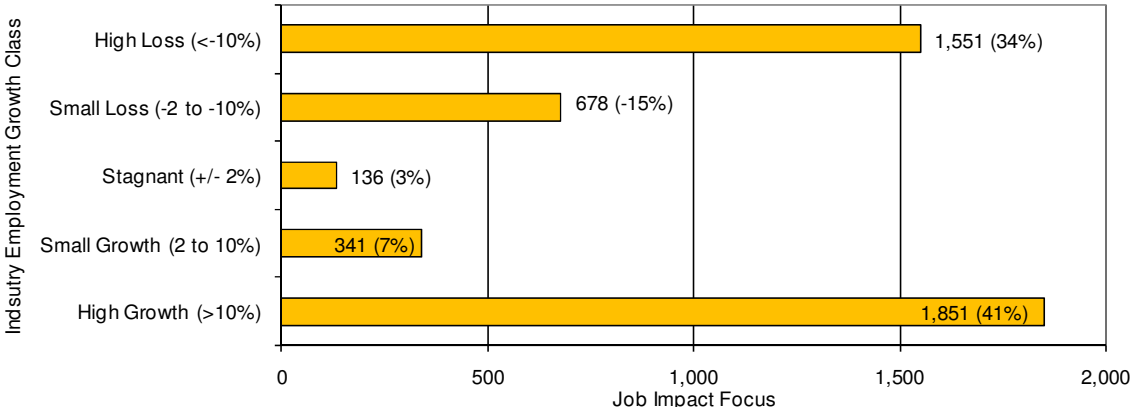
- The share of total jobs in the *manufacturing* and *finance and insurance* industry groups is expected to decline over the next ten years. This actually reflects slower growth or stagnation in these industries, while other sectors of the economy are growing faster. In addition, increasing labor productivity (output/worker) in manufacturing makes jobs grow at a slower rate than industry output. The share of total jobs created by Focus programs in these industry groups is smaller than their current or projected future shares of total jobs in the general economy.

The analysis shown in Figure 5-3 was examined at a more detailed 66-sector industry level. We capture the percentage change in base case employment over the 2002–2011 interval as predicted by the REMI model. Based on this information, we classified all Wisconsin industries into five industry growth classes:

- High growth (over ten percent increase in employment)
- Small growth (two to ten percent increase in employment)
- Stagnant (forecast change ±two percent)
- Small loss (two to ten percent loss of employment)
- High loss (over ten percent loss of employment).

Using this classification, we can transform the distribution of Focus program job impacts by industry (shown earlier in Tables 5-1 and 5-2) into a breakdown of Focus program job impacts by growth class. The result, shown in Figure 5-4 indicates that 41 percent (1,851) jobs created as a consequence of Focus are in high growth industries, while seven percent (341) are in lower growth industries, three percent (136) are in stagnant industries and 48 percent (2,229) are in the two classes of shrinking industries.

Figure 5-4. Impacts on Job Growth by Industry Growth Class, Year 10



Source: REMI model runs by Economic Development Research Group

6. IMPACTS BY OCCUPATION

Section five examines the economic impacts from Focus programs in terms of its effect on job creation with a focus on occupational type. Economic growth impacts of Focus are best understood by examining the consequences of maintaining the program for ten years. The reason for this is that the cost savings from program participation accumulate over time, leading to more significant impact on the magnitude of spending changes, business attraction from improved competitiveness, development of trade, and market changes over that time span. Many of the economic growth impacts therefore unfold with a delayed effect. Accordingly, this section examines differences in the economy in the tenth program year after implementation, compared to what would be expected without the Focus programs.

This section examines (1) the skill levels of jobs resulting from Focus, and (2) implication for *green job impacts*, and (3) average annual compensation levels. Sections 6.1 and 6.3 examine statewide impacts relative to existing Wisconsin occupational patterns.

6.1 OCCUPATION MIX

Table 6-1 provides an overview of total private-sector job creation by occupation (based on the SOC—Standard Occupational Classification groups). These results indicate that Focus supports job growth across virtually all major occupational groups and therefore a range of skill levels.

Table 6-1. Summary of Focus Job Impacts by Occupation, Program Year 10

SOC Group	Occupation Description	Jobs Created*	Percent of Total
11	Management Occupations	287	6.3%
13	Business and Financial Operations Occupations	186	4.1%
15	Computer and Mathematical Occupations	129	2.8%
17	Architecture and Engineering Occupations	97	2.1%
19	Life, Physical, and Social Science Occupations	34	0.8%
21	Community and Social Services Occupations	37	0.8%
23	Legal Occupations	47	1.0%
25	Education, Training, and Library Occupations	46	1.0%
27	Arts, Design, Entertainment, Sports, and Media Occupations	53	1.2%
29	Healthcare Practitioners and Technical Occupations	162	3.6%
31	Healthcare Support Occupations	93	2.0%
33	Protective Service Occupations	34	0.7%
35	Food Preparation and Serving Related Occupations	243	5.3%
37	Building and Grounds Cleaning and Maintenance Occupations	150	3.3%
39	Personal Care and Service Occupations	124	2.7%
41	Sales and Related Occupations	480	10.5%
43	Office and Administrative Support Occupations	694	15.2%
45	Farming, Fishing, and Forestry Occupations	38	0.8%
47	Construction and Extraction Occupations	854	18.7%
49	Installation, Maintenance, and Repair Occupations	221	4.9%
51	Production Occupations	301	6.6%
53	Transportation and Material Moving Occupations	245	5.4%
	Total Jobs Supported by Focus in 10th Program Year	**4,557**	**100.00%**

The occupational groups experiencing the largest percentage increase of job growth under Focus include *Production* (manufacturing), *Construction*, *Office and Administrative Support,* and *Food Preparation and Serving* (related to prepared food and meals at restaurants).

6.2 OCCUPATION SKILL LEVELS

Job creation results from Focus impacts on business sales growth. Whenever a business grows in the volume of sales activity, there is normally a corresponding increase in employment. The magnitude of the change in jobs, however, differs dramatically among industries because each industry has a different mix of needs for equipment, materials, and workers.

Another key issue is that the skill and pay level are not the same across industries, which reflects the occupational mix of an industry's employment base. Some technology-driven manufacturing and service industries provide a significant amount of jobs for highly paid skilled workers, while other industries such as retailing and wholesaling rely more heavily on lower paid semi-skilled workers.

Each industry has its own unique combination of occupational skill needs. Job growth impacts of Focus are calculated in the REMI economic model by gauging the industrial growth opportunities, then the requisite occupational demands, and finally Wisconsin's existing and projected future workforce skills and pay levels. This process is important in ensuring that the projected impact on jobs is realistic, which means that the industry growth projections are generally consistent with anticipated workforce skills and wage levels in Wisconsin.

The economic impact projections from Focus is an increasing number of additional jobs (across both private and public sectors) in Wisconsin—amounting to 5,194 more jobs present by the tenth year. Table 6-2 shows detailed occupational impacts of the year ten Focus impacts on private-sector jobs created (4,557) based on 94 occupational categories (from the occupation mapping in the REMI model). Overall, it shows that Focus programs ultimately affect an extremely wide range of job types, reflecting the broad industry impacts previously noted. The largest numbers of job impacts are in local services such as restaurant, office administration, and construction, but Focus also supports a large number of managerial, professional, and manufacturing jobs.

Table 6-2. Impacts on Jobs, by Detailed Occupation (Tenth Program Year)*

Category	Compensation level **	Occupation Description	Number of Jobs
Management and professional (1084 jobs, 24 percent of total)	M	Top Executives	104
	H	Advertising, marketing, promotions, public relations, sales managers	26
	H	Operations Specialties Managers	62
	M	Other Management Occupations	88
	H	Business Operations Specialists	109
	H	Financial Specialists	81
	H	Computer Specialists	119
	H	Mathematical science occupations	3
	M	Architects, Surveyors, and Cartographers	14
	H	Engineers	56
	H	Drafters, Engineering, and Mapping Technicians	38
	H	Life Scientists	7
	H	Physical Scientists	7
	H	Social scientists and related occupations	10
	H	Life, Physical, and Social Science Technicians	10
	L	Counselors, Social workers	24
	L	Religious Workers	9
	L	Miscellaneous community and social service specialists	4
	H	Lawyers, Judges, and Related Workers	28
	H	Legal Support Workers	17
	L	Postsecondary Teachers	11
	L	Primary, secondary, and special education teachers	17
	L	Other Teachers and Instructors	10
	M	Librarians, Curators, and Archivists	2
	L	Other Education, Training, and Library Occupations	10
	M	Art and design occupations	22
	L	Entertainers and performers, sports and related occupations	12
	M	Media and communication occupations	14
	M	Media and communication equipment occupations	6
	H	Health Diagnosing and Treating Practitioners	93
	H	Health Technologists and Technicians	64
	H	Other Healthcare Practitioners and Technical Occupations	7

Category	Compensation level **	Occupation Description	Number of Jobs
Services (656 jobs, 14% of total)	M	Nursing, Psychiatric, and Home Health Aides	47
	H	Occupational and Physical Therapist Assistants and Aides	4
	H	Other Healthcare Support Occupations	45
	L	First-Line Supervisors/Managers, Protective Service Workers	1
	L	Fire Fighting and Prevention Workers	0
	L	Law Enforcement Workers	1
	L	Other Protective Service Workers	36
	L	Supervisors, Food Preparation and Serving Workers	18
	L	Cooks and Food Preparation Workers	61
	L	Food and Beverage Serving Workers	139
	L	Other Food Preparation and Serving Related Workers	30
	L	Supervisors, building and grounds cleaning and maintenance workers	8
	L	Building Cleaning and Pest Control Workers	105
	L	Grounds Maintenance Workers	34
	L	Supervisors, Personal Care and Service Workers	7
	L	Animal Care and Service Workers	8
	L	Entertainment Attendants and Related Workers	12
	L	Funeral Service Workers	2
	L	Personal Appearance Workers	25
	M	Transportation, Tourism, and Lodging Attendants	3
	L	Other Personal Care and Service Workers	70
Sales and Office (1,161 jobs, 25% of total)	L	Supervisors, Sales Workers	51
	L	Retail Sales Workers	269
	H	Sales Representatives, Services	27
	H	Sales Representatives, Wholesale and Manufacturing	56
	L	Other Sales and Related Workers	57
	H	Supervisors, Office and Administrative Support Workers	44
	M	Communications Equipment Operators	6
	H	Financial Clerks	132
	M	Information and Record Clerks	161
	M	Material recording, scheduling, dispatching, and distributing occupations	82
	M	Secretaries and Administrative Assistants	142
	M	Other Office and Administrative Support Workers	134

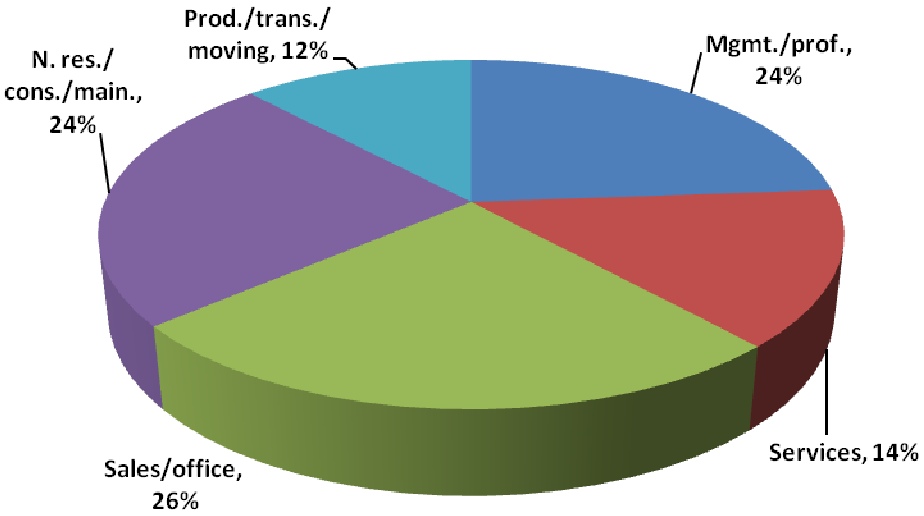
Category	Compensation level **	Occupation Description	Number of Jobs
Natural Resources, Construction, Maintenance (1107 jobs, 24% of total)	L	Supervisors, Farming, Fishing, and Forestry Workers	2
	L	Agricultural Workers	30
	L	Forest, Conservation, and Logging Workers	1
	L	Forest, Conservation, and Logging Workers	7
	M	Supervisors, Construction and Extraction Workers	76
	M	Construction trades and related workers	675
	M	Helpers, Construction Trades	67
	M	Other Construction and Related Workers	20
	M	Extraction Workers	6
	M	Supervisors of Installation, Maintenance, and Repair Workers	16
	H	Electrical and electronic equipment mechanics, installers, and repairers	21
	L	Vehicle and mobile equipment mechanics, installers, and repairers	52
	M	Other Installation, Maintenance, and Repair Occupations	134
Production, Transportation and Material Moving (549 jobs, 12% of total)	H	Supervisors, Production Workers	21
	H	Assemblers and Fabricators	53
	M	Food processing occupations	18
	H	Metal Workers and Plastic Workers	85
	H	Printing occupations	10
	M	Textile, apparel, and furnishings occupations	21
	M	Woodworkers	9
	H	Plant and System Operators	4
	H	Other Production Occupations	84
	M	Supervisors, Transportation and Material Moving Workers	8
	H	Air transportation occupations	1
	M	Motor Vehicle Operators	98
	H	Rail transportation occupations	0
	H	Water transportation occupations	1
	L	Other Transportation Workers	9
	M	Material moving occupations	127
		Focus' Total Job Impacts	**4,557**
		Low Compensating Job Impacts	1,132
		Medium Compensating Job Impacts	2,100
		High Compensating Job Impacts	1,325

* Results reflect the Business, Residential, and Renewable portfolios for the Historic funding scenario, excluding market effects.

** See section 6.4 for the definition of the annual compensation levels, L, M, or H.

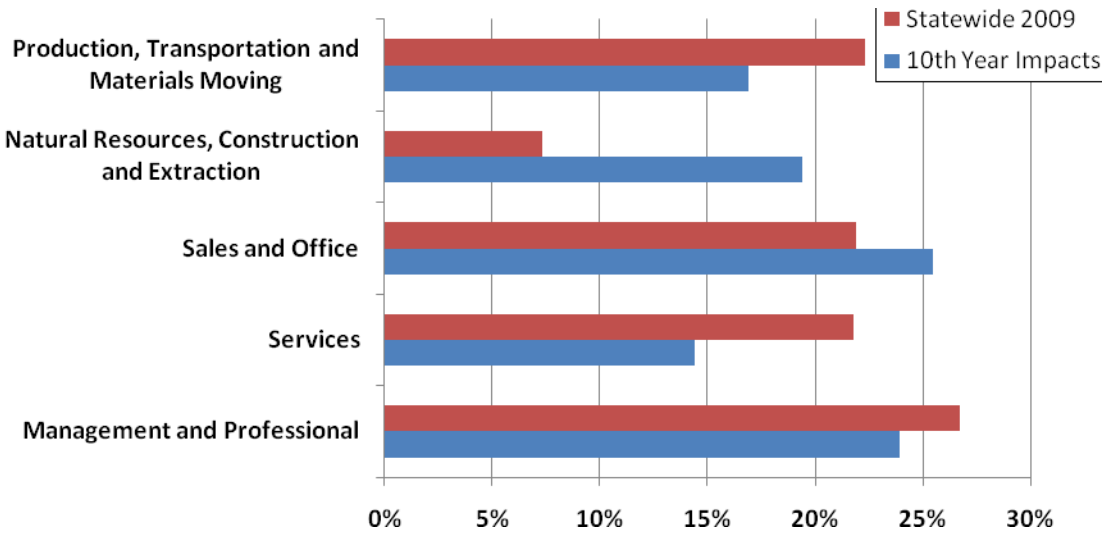
To better demonstrate the patterns of impact, Figure 6-1 summarizes the share of job impacts by aggregate occupational groups.

Figure 6-1. Occupation Mix of Focus's Job Impacts



To further interpret these results, it is useful to compare Focus' job impacts to the current mix of occupations in Wisconsin. The results are shown in Figure 6-2.

Figure 6-2. Occupation Mix of Existing Wisconsin Jobs and Focus Impacted* Jobs



* Through tenth program year; Focus results include Business, Residential, and Renewable portfolios for the Historic funding scenario, excluding market effects.

Overall, Focus supports new employment with a higher proportion of workers in *technical services, construction* (installation contractors), and *sales and administrative* functions than existing Wisconsin employment trends.

6.3 GREEN JOBS IMPLICATION

Approach. There is significant current interest in identifying the extent to which public programs, such as Focus, create jobs—and particularly "green" jobs. However, this is the first time that the issue is being addressed in a Focus evaluation report, so there is a need to first lay out definitions and the structured analysis process that is required to estimate the "green job" impact of the program. While there are a handful of recent state-specific documents—ranging from studies to press releases—announcing the *"greenness"* of an economy, they are diverse in *defining what constitutes a green job* and none are defined in the context of program evaluation. This analysis process for Focus attempts to measure the mechanisms that lead to green job requirements in ***a*** horizon year of the program (2011). It involves four steps that address the following questions:

1. What *definition* and *objectives* of green programs are relevant for this study?
2. Given step 1, what *operational elements* of the program correspond to those objectives?
3. Given step 2, how should we *measure* green jobs associated with this study?
4. Given step 3, what are the *actual impacts* of the program on green jobs?

Step 1. Definition and objectives. There is wide variation among groups and individuals regarding the definition of "green" jobs. This is a consequence of the origin of the "green" concept, which traces back several decades to the green movement that has at various times espoused a broad set of sustainable ecological, social, and economic goals including:

- **Energy resources.** Minimizing natural resource depletion, by reducing use of non-renewable energy resources and increasing use of renewable energy resources
- **Environment.** Minimizing impact on air and water quality by reducing emissions of compounds that contribute to health problems and climate change
- **Waste.** Minimizing impact on soil quality and drinking water by reducing generation of solid waste and contaminants, and increasing recycling
- **Economy.** Maximizing well-paying local jobs and minimizing transportation resource use, by increasing use of locally-made products and services
- **Social.** Maximizing social justice, equal opportunity, and related goals.

These elements describe *what a green economy* accomplishes because there is a wide set of potential "green" goals; different interest groups have tended to define "green" in terms of those particular goals that are most relevant to them. While that has lead to multiple definitions of "green" policies and jobs, the different definitions may in fact be fully appropriate when assessing different types of programs. In the current American policy context, the focus of most "green" programs is on energy, environment, and waste-related goals. (An overview of the range of different alternative definitions of "green jobs" is provided in Appendix C.)

➔ *Focus* was designed with a primary objective of optimizing use of energy resources, with programs to reduce energy consumption and support development of customer-sited renewable energy generation. There are secondary objectives to also reduce emissions of air pollutants and carbon contributors to global warming, and generate more well-paying jobs for Wisconsin residents. The program evaluation process was set up to monitor both the primary and secondary impact elements. We posit that the "green jobs" associated with Focus activities include (a) *in-state manufacturing of Focus technology components,* (b) *the jobs administering various aspects of Focus program (public or private (for and non-profit),* and (c) *jobs in the market channel (distribution/sales) and installation services that bring and implement a project to a customer's site*. This definition encompasses all of the *direct* jobs we identify from the Focus activities.

Step 2. Operational elements. The primary and secondary objectives of energy programs are addressed through three types of operational elements:

- **Product technologies (manufacture of energy efficiency or renewable energy co-products/components).** Program elements affecting the specifications of (1) stationary building shells (insulation, windows, air leakage), (2) stationary equipment (lighting, HVAC, controls, motors and business process equipment), (3) mobile vehicles (engines, emission systems), and (4) energy generation and transmission systems (fuels, power generation, etc)
- **Behaviors (participant "uptake" or installations).** Program elements affecting methods used for (1) product construction and installation processes and (2) frequency and patterns of use of products and their control equipment
- **Programs and regulations (program administration).** Program elements that implement (1) information dissemination, (2) incentive mechanisms (ranging from direct incentives to indirect tax benefits), (3) support services (energy audit, installation and sales services), and (4) regulations (minimum requirements for various products).

➔ *Focus* was set up and designed with operational elements to enhance a specific set of energy-efficient or renewable products (buildings and energy generation systems), behaviors (construction, installation, and use of products) and program services (information, incentive and support). It was not set up to directly affect manufactured product specifications or regulations.

Step 3: Defining green job measurement. The measurement of "green" jobs associated with Wisconsin Focus programs or any publicly-supported program is most appropriately accomplished through a process of first measuring the spending associated with each of the operational elements, and then isolating the number of jobs (and in which industries) that are associated with the "green" program objectives[6]. This is done for the *direct* job implications emanating from the Focus portfolios and does not extend to the subsequent rounds of job impact that are part of the *total* job impacts referred to elsewhere in this report. (See

[6] The method of "green" *employment* measurement most approximates the *industry production* approach in the recent Pew Trusts *Clean Energy Economy* (June 2009), albeit using a different database.

Appendix C for an explanation of how direct "green" jobs are identified from various Focus operational elements.)

The table below summarizes the different combinations of program action elements that may be associated with "green" program objectives. A fundamental observation to be made from this table is that any action that helps to achieve "green" program objectives (by reducing energy consumption and increasing renewable generation) may be considered to be "green." In other words, there is no reason to identify adoption of green product technologies (such as use of renewable power generation) to be intrinsically any more "green" than adoption of green behaviors (such as reduction in demand for energy). In theory, both can potentially reduce air pollution, carbon emissions and resource depletion, and achieve the target impact levels.

Table 6-3. Matrix of Objectives and Program Elements of Wisconsin Focus

Green Program Objectives	Green Program Elements		
	Support for Green Product Technologies	Support for Green Behaviors	Relevant Program Operation
Reduce energy use	Buildings and equipment	Audits, incentives, info and installation	Staff of energy efficiency programs
Increase renewable generation	Generating facilities	Incentives	Staff of renewable energy programs
Reduce air emissions	(Byproduct of above categories)	(Byproduct of above categories)	(Byproduct of above categories)
Promote local industry	Support energy services and trade allies	(Byproduct of above categories)	Trade ally program

➔ *Focus* creates and supports "green jobs" through four processes, which can be viewed as representing four gradations of "green" insofar as they differ in how directly they relate the achievement of green objectives:

1. **Operation of renewable power generating facilities in Wisconsin.** Without the development of new renewable power capacity facilitated by Focus, more energy would be supplied by traditional generating facilities, with greater use of non-renewable fuels and greater emissions. For that reason, jobs associated with operating these facilities may be considered to be green jobs.

2. **Manufacturing of green products.** Without the additional demand for energy efficient doors, windows, insulation, lighting, and process equipment attributable to Focus, there would be greater use of traditional energy sources and greater emissions. For that reason, jobs associated with the manufacturing of these products may be considered to be green jobs. Wisconsin made green products that replace conventional out-of-state products supports secondary green goals of increasing the local content of products and reducing energy used for inter-state transportation.

3. **Services providing audits, information, and incentives.** Without the energy audit, information and incentive elements of Focus, there would be less use of energy efficient equipment and less prevalence of energy-conserving behaviors. For that reason, jobs associated with the administration, operation, and delivery of these services may also be considered as green jobs.

4. **Distribution and installation of green products.** Without the distribution channels and installation services for green products that are put in because of Focus, the advantages of these products would not be realized. For that reason, jobs associated with distribution and installation of these products may also be considered to be green jobs.

Step 4: Net vs. gross impact. A final element of the analysis is the distinction regarding net and gross impact on jobs. An argument against the inclusion of Category #4 is that the many of the same people who sell, distribute, and install energy-efficient products also work at sales, distribution, and installation of traditional (not energy-efficient) products. So, for instance, there may not be any additional jobs being created by the switch from installation of traditional doors and windows to installation of energy-efficient doors and windows. In fact, the same type of argument can be made about Categories #1, 2 and 3—that the *net change* in number of jobs resulting from shifts to green products and services may be less than the *gross magnitude* of green jobs because many or most of the "green" jobs are merely displacing traditional manufacturing and service jobs. However, that line of reasoning is confusing together two very different questions:

1. How many jobs are involved in supporting "green" objectives because of Focus?
2. How many new jobs are being created by Focus that would otherwise not exist in Wisconsin?

The Focus energy impact evaluation (covered in other reports) has distinguished the program's incremental impact on increasing adoption of energy efficient products and services (i.e., the net effect beyond what would otherwise be expected to occur). And the economic impact analysis (covered elsewhere in this report) has distinguished the program's impact on total jobs occurring in the state of Wisconsin beyond what would otherwise be expected to occur. These two elements of evaluation make it possible to identify the extent to which the additional jobs being created in Wisconsin can be considered to be "green."

Findings. The economic impact modeling process, described elsewhere in this report,, projects that Focus programs will lead to a net addition of 5,194 jobs in Wisconsin as of year ten (i.e., 2011), assuming continued but flat funding from now through that year (the *Historic* scenario). These jobs are generated through four mechanisms:

- **Direct program spending**, which support program operations staff and energy audit contractors
- **Increases in direct materials and equipment investments** made by program participants (with support from Focus), which directly generate additional manufacturing, distribution, sales and installations of energy efficiency and renewable energy products
- **Indirect effects** on business sales as a result of additional business orders for parts and materials suppliers (generated by the direct spending and investment)
- **Induced effects** on business sales as a result of workers spending their wages (generated by the additional direct and indirect jobs) on consumer purchases throughout the economy.

"Green" jobs that we attribute to the Focus program are limited to a subset of the directly-generated jobs (first two categories). Some unknown fraction of the indirect and induced

effects (last two categories) will undoubtedly go to the purchase and use of additional green products and services; however, there is currently no reliable source of information on that fraction. Thus, all estimates of green jobs provided in this report represent a low-end (or conservative) annual estimate emanating from the program.

Of the directly-generated jobs, their relationship to "green" energy and environmental goals are classified below.

- **Operation of renewable power generating facilities in Wisconsin.** There is currently no data on the number of full-time jobs associated with continuing operation of new renewable energy facilities that have been made possible by Focus. Most of the renewable funding-to-date, however, has been for equipment that runs with limited need for daily attention. Thus, while the energy impacts are notable, the expected number of jobs in this category is deemed to be negligible.

- **Manufacturing of green products.** The program directly supports acquisition of additional high efficiency HVAC, lighting, controls, and process equipment, as well as renewable generation equipment. The separate evaluation of net program impacts had measured the increase in acquisition of this energy efficient equipment beyond what would otherwise be expected to occur, and that was a basis for the estimation of the *direct* manufacturing job impacts. For that reason, all of the additional jobs involved in the manufacturing of energy efficient products (that were generated by the program, and which would not have otherwise been produced) may also be classified as "green." That totals 193 additional manufacturing jobs generated by the program. However, we cannot be certain that purchases of non-efficient products are not being reduced as a consequence, in which case some manufacturing jobs may merely be shifted from non-green to green product lines. These green jobs are classified as being in the manufacturing sectors for metal, machinery, electrical equipment, and other products, as shown in the table below.

Table 6-4. Direct Impact from Participant's Equipment Investment on Green Manufacturing Jobs in Wisconsin, Year 2011

Manufacturing Industry	Residential	Business	Renewables	Total
Metal product manufacturing	2	0	11	13
Electrical and machinery manufacturing	47	89	4	139
Miscellaneous product manufacturing	13	12	16	41
Total	**61**	**101**	**31**	**193**

- **Services providing audits, information, and incentives.** Operation of Focus directly supports jobs involved in either program operation or conduct of additional energy audits and technical services. These jobs are highly unlikely to exist without the program. However, they can be considered green only insofar as evaluations confirm that they are effective in helping to achieve the green goals of reduced use of energy from non-renewable resources. Since the energy impact analysis appears to support that finding, these 579 additional jobs generated by the program (shown in the table below) should also be considered to be "green." (Note that these numbers include jobs associated with operating the program at non-profit organizations such as WECC.)

Table 6-5. Direct Impact from Focus Administration on Green Program Operations in Wisconsin, Year 2011

Program Administration	Residential	Business	Renewables	Total
Rental and leasing services	2	5	0	7
Professional and technical services	99	225	27	351
Government and other administrative entities	56	129	15	200
Total	**160**	**386**	**33**	**579**

- **Distribution, sales, and installation of green products.** There is some uncertainty about whether all jobs associated with sales, distribution and installation of green products should be counted as "green" jobs. On the one hand, products that are designed and built to be "green" cannot achieve their green goals (of reducing use of energy from non-renewable resources) unless they are distributed, sold and installed. And in some cases, the sellers and installers are specialized firms and professionals who focus either primarily or exclusively in the sales and installation of energy efficient equipment or renewable technologies.

  It is also likely, however, that some construction companies and installers of energy efficient lighting, HVAC, windows, and doors also install standard efficiency products. In that case, some sales and installation of green products may be merely shifting the types of items being installed.

  Altogether, there are 941 sales and installation jobs directly generated by the program that fall into this category, as shown in the table that follows. At a minimum, it appears clear that the 77 associated with the renewables program are new "green" jobs. At a maximum, there can be an argument that all 941 are part of the process that enables "green" products to be acquired, installed, and operated. Fundamentally, there is a wide spectrum of variation in the extent to which various jobs contribute to "green" goals. The approach taken here is clearly conservative relative to most of the existing (and recent) literature that defines any job associated with companies that help to achieve "green" goals as fully "green."

Table 6-6. Direct Impact from Installations on Green Product Distribution and Installation Jobs in Wisconsin, Year 2011

Sales and Installation Industry	Residential	Business	Renewables	Total
Sales: Retail and wholesale trade	110	17	12	139
Distribution: Truck transport and courier	1	0	3	4
Construction and related building trades	218	517	62	798
Total	**329**	**534**	**77**	**941**

- **Overall impact on green jobs.** The Focus program is estimated to support between 772 (tied to in-state manufacturing and program administration) and 1,713 (if distribution, sales & installation functions are also acknowledged) *direct* "green" jobs (as of 2011), depending on the definition selected for "green jobs," and in particular the treatment of sales and installation of energy efficient products. To further interpret these findings, readers are encouraged to see the appendix discussion of "green job" definitions.

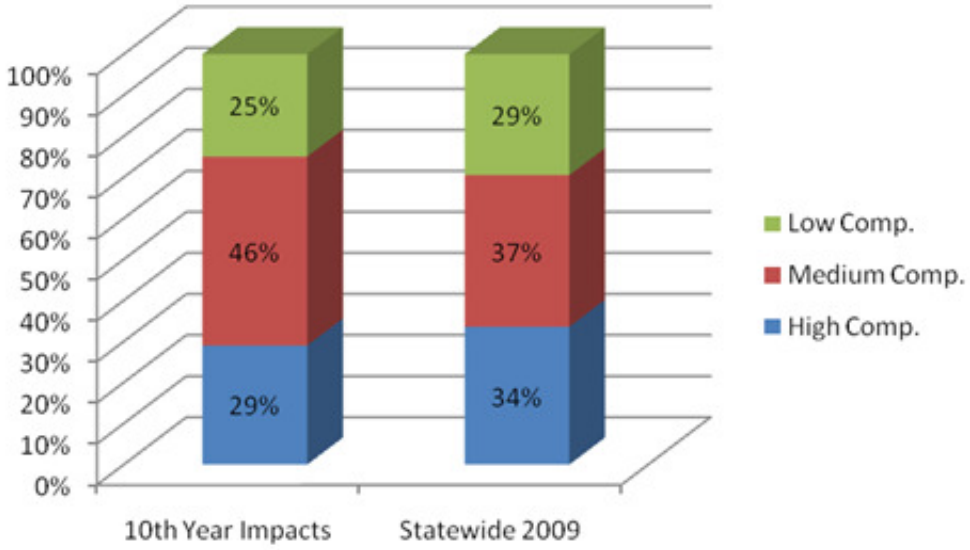
6.4 COMPENSATION LEVELS

The employment supported by Focus programs can be grouped by average annual compensation level as well as occupational group. Differences in compensation reflects, to some degree, the demand for that occupation, the skill level required, and the amount of education or training necessary for to be qualified for that position. As a consequence, the pattern of program impacts on industries also leads to impacts on the mix of pay levels for new jobs.

Table 6-6 above scored each occupation into one of three compensation groups: high, medium, and low. The high group indicates impacted occupations where the average compensation is at least 15 percent greater than the state average compensation of $38,315. The low group designates those that are at least 15 percent below the state average, and the medium category gathers all occupations within 15 percent of the average (between $32,568 and $44,062). The annual labor income levels range from approximately $99,000 at the high end to approximately $6,000 at the low end of the range. (All figures are in nominal dollars and reflect 2008 annual compensation as calculated by REMI model). This analysis shows that many of the higher paying jobs are in the manufacturing and credit/finance/banking sector, while many of the lower paying jobs are in retail and service sectors.

Using this classification, Figure 6-3 shows the compensation distribution of the jobs impacts resulting from *Focus*. This is compared to the labor compensation class distribution of the overall Wisconsin economy. The results indicate that, overall, the wage distribution of Focus-supported employment is relatively close to current Wisconsin levels; however, job impacts are slightly higher in the low and medium compensation categories and lower for the high compensation category.

Figure 6-3. Labor Compensation Mix of Existing Jobs and Focus Impacted Jobs



Source: REMI model runs by Economic Development Research Group

Economic development policy may seek to promote forms of economic growth that expand demand for jobs in leading technology industries with above-average compensation, or it may seek to replace lost jobs in lower paying, less highly skilled job categories. The results shown

in Figure 6-3 indicate that Focus is supporting the growth of a wide range of jobs with generally average pay. In any case, though, it should be clear that program design and marketing can affect the nature of the job impacts. This means that there are opportunities for further “fine tuning” of the program design and marketing to further achieve those goals.

7. IMPACTS BY URBAN-RURAL LOCATION

This section examines the impacts of Focus in terms of the distribution of the economic benefits among urban, rural, and semi-rural counties in the state.

7.1 MEASUREMENT OF ENERGY SAVINGS AS AN ECONOMIC DRIVER

In the preceding sections of this report, economic development benefits are represented as changes in the economy—jobs, business sales, disposable income, and gross state product. However, the statewide REMI model used to determine the magnitude of these impacts does not provide a distribution of these benefits by geographic region. Therefore, as an alternative, this section reports instead on the distribution of key drivers of these economic impacts—the savings in energy costs for households and businesses (including the Farm sector) that have participated in Focus. The choice to explore the distribution of Focus's economic benefits across urban and rural regions was driven by the state's interest in this analysis and the legislated mandate of rural economic development. This analysis is conducted on data representing Focus activity through the end of fiscal year 2009.

The information presented in this section on energy bill savings is based on the detailed data concerning gross energy savings that was provided by the Residential and Business program administrators. For purposes of the economic impact and benefit-cost analyses, those gross energy savings were converted to net energy savings and their value calculated based on the utility cost per unit of electricity and natural gas. That represents a societal view of the net program impacts without inflation for activities that would have occurred anyway. The results were then recalculated in terms of Focus participation from the state's urban counties, its rural counties, and its semi-urban counties.

7.2 CLASSIFICATION OF COUNTIES AND ELIGIBLE CUSTOMERS

Classification of counties. Counties were assigned a type of urban, semi-rural, or rural based on a coding system created by the Economic Research Service of the US Department of Agriculture that assigns counties into one of ten categories based on their population density, urban population, and proximity to an urban area. Table 7-1 below shows a description of the eight (of nine classifications) codes that apply to Wisconsin, lists the counties included in each category, and has the codes grouped by county type. Twenty-five of Wisconsin's 72 counties are classified as urban. These 25 urban counties are home to approximately 73 percent of Wisconsin's population and make up around 30 percent of its land area. The 17 counties classified as rural are home to just over 4.7 percent of Wisconsin's population and make up around 25 percent of its land area.

Table 7-1. Classification of Wisconsin Counties by Urban-Rural Status

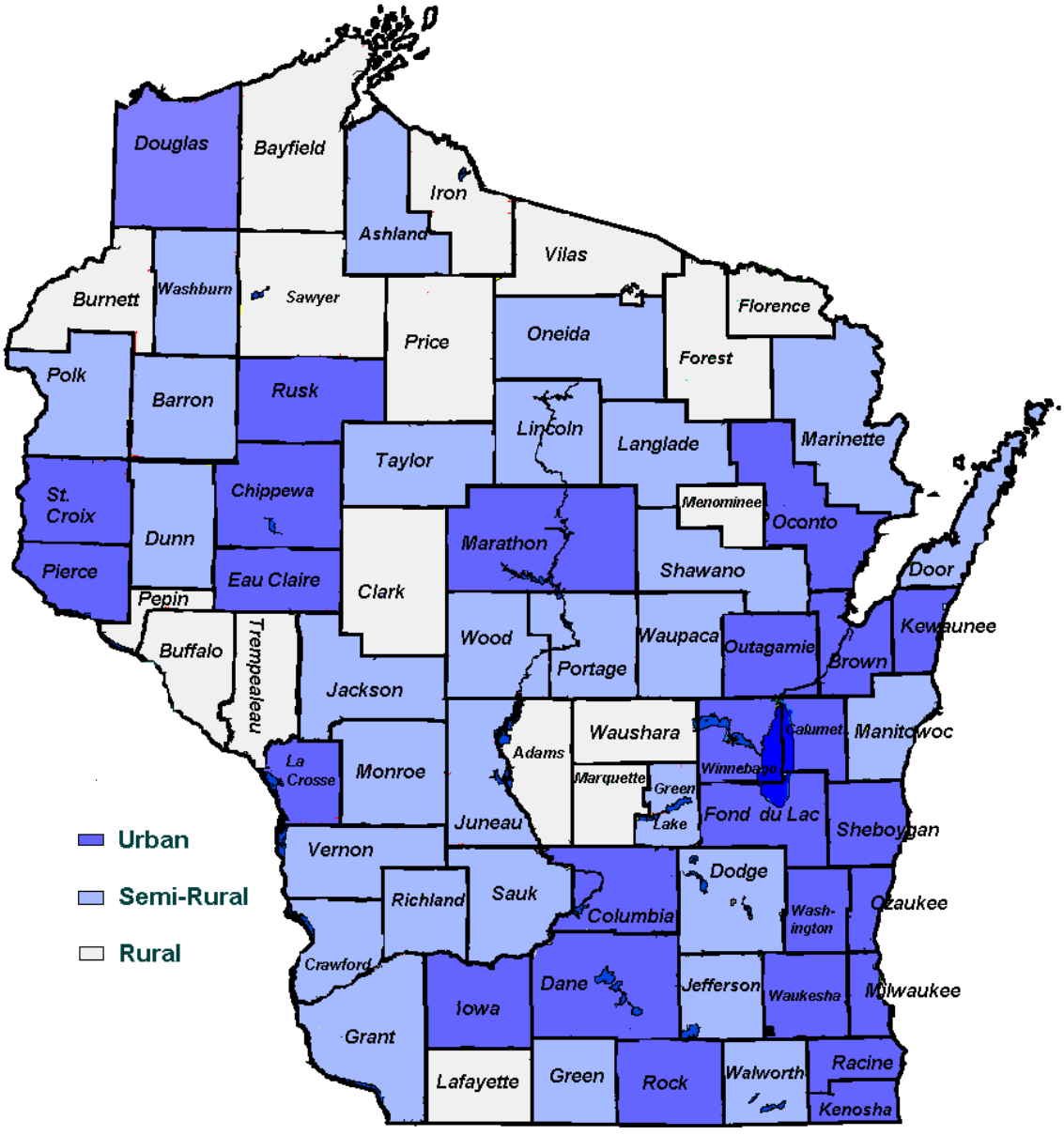
County Type	Category Code	Description	Counties Included	Percentage of Wisconsin Population 2008	Percentage of Land Area
Urban	1	County in metro area with 1 million population or more	Kenosha, Milwaukee, Ozaukee, Pierce, St. Croix, Washington, Waukesha	32.60%	5.60%
	2	County in metro area of 250,000 to 1 million population	Brown, Columbia, Dane, Douglas, Iowa, Kewaunee, Oconto	16.10%	10.90%
	3	County in metro area of fewer than 250,000 population	Calumet, Chippewa, Eau Claire, Fond du Lac, La Crosse, Marathon, Outagamie, Racine, Rock, Sheboygan, Winnebago	24.10%	13.50%
Semi-rural	4	Nonmetro county with urban population of 20,000 or more, adjacent to a metro area	Dodge, Jefferson, Manitowoc, Portage, Sauk, Walworth, Wood	9.80%	9.30%
	6	Nonmetro county with urban population of 2,500-19,999, adjacent to a metro area	Barron, Door, Dunn, Grant, Green, Green Lake, Jackson, Langlade, Lincoln, Marinette, Monroe, Polk, Richland, Rusk, Shawano, Taylor, Vernon, Washburn, Waupaca	10.80%	29.40%
	7	Nonmetro county with urban population of 2,500-19,999, not adjacent to a metro area	Ashland, Crawford, Juneau, Oneida	1.70%	6.50%
Rural	8	Nonmetro county completely rural or less than 2,500 urban population, adj. to metro area	Ashland, Bayfield, Buffalo, Burnett, Clark, Lafayette, Marquette, Menominee Pepin, Trempealeau, Waushara	3.40%	14.50%
	9	Nonmetro county completely rural or less than 2,500 urban population, not adj. to metro area	Florence, Forest, Iron, Price, Sawyer, Vilas	1.30%	10.40%
Total				**5,627,967**	**54,314**

Source: USDA Economic Research Service (ERS) Rural Urban Continuum Codes.

Figure 7-1 provides a map of Wisconsin's counties, shaded to identify their county type. A review of the map shows that that the classification of counties is largely consistent with what someone familiar with the state might expect: half of Wisconsin's counties are semi-rural, eight of the 17 rural counties are located in the northernmost portion of the state; seven of the 25 urban counties are in the Milwaukee area or the corridor between Milwaukee and Chicago

with the other urban counties being those containing Wisconsin's larger cities and/or have high rates of commuting to those metropolitan areas (e.g., Dane County [Madison], La Crosse County [La Crosse], Brown County [Green Bay]) or are located close to Minneapolis, Minnesota (e.g., Pierce and St. Croix Counties).

Figure 7-1. Map of Wisconsin Counties by Urban-Rural Class



Classification of eligibility to participate. Not all Wisconsin residents or businesses are eligible to participate in Focus programs. Only those households or businesses in a participating utilities' territory are eligible. While investor owned utilities (IOUs) were required

to participate in Focus, municipal utilities and cooperatives were not. Currently there are 95 utilities participating in Focus programs[7]. These utilities serve approximately 93 percent of Wisconsin's 2.564 million households and approximately 84 percent of Wisconsin's roughly 393,241 business establishments. However, the semi-rural and rural counties are more likely to be served by a municipal or a cooperative utility, and, therefore, homes and businesses located in urban counties are more likely to be located in a participating utility territory with 90 percent of households in urban counties being eligible, while only 65 percent of households located in rural counties are eligible. Similarly, 92 percent of businesses in urban counties are eligible, while only 66 percent of businesses in rural areas are eligible.

For the commercial and industrial sectors the estimates of eligible participants was based on two efforts.

1. The number of businesses in participating utility territories in each county were estimated by determining the proportion of businesses in the state of Wisconsin Department of Workforce Development Standard Name and Address Program (SNAP) covered by Wisconsin's unemployment insurance law. It was determined, based on geographic location, whether each business was in a territory of a utility participating in the Focus program. Then, for each industry in each county, the proportion of the businesses that were in a participating utility territory was determined. This proportion was then applied to the number of businesses in each corresponding industry/county as reported by Dunn and Bradstreet to arrive at an estimate of the number of businesses eligible to participate in each industry in each county.

2. The second step was to identify the industries targeted by the Business Program administrator. This analysis resulted in the identification of 23 of the 82 two-digit SIC codes as being targeted by the industrial programs and 28 of the 82 two-digit SIC codes as being targeted by the commercial programs, with eight industries being targeted by both the industrial and commercial programs. The 23 codes identified as being targeted by the industrial programs account for about 33 percent of Wisconsin's industrial businesses, while the 28 codes identified as being targeted by the commercial programs account for about 79 percent of Wisconsin's commercial businesses. The number of eligible participants was then estimated by summing the eligible participants in each county for each of the industries identified as being targeted by the program administrator. In addition there is a more broad reaching market based approach that uses channels to reach any business that wants to participate in energy efficiency adoption. Since the Business program direct effects of Focus are organized by evaluators into broad segments (commercial, industrial, agricultural, and state/local government), the subsequent economic analysis handles the allocation of direct effects across different types of businesses.

For the residential sectors, the estimate of the number of eligible households for each county was determined by the proportion of the area of each census block group that was within the boundaries of a utility participating in Focus. This proportion was applied to the population of

[7] This includes the WPPI member utilities that are eligible for Focus electric "prescriptive" measures only.

that census block group to estimate the number of participating households within the block group. Block group estimates were then aggregated to the county level.

7.3 FINDINGS—RESIDENTIAL PROGRAMS

As of June 30, 2009 (the end of the state's 2009 fiscal year), the lifecycle verified *gross* annual energy bill savings attributable to the Focus residential programs had risen to $84,648,115 (Table 2-1a of the 2009 semiannual report[8]). Converted to *net* annual energy savings valued at utility avoided cost (as shown in detail in Appendix A of the 2009 semiannual report[9], its net value is calculated to $75,336,822.

The distribution of the value of net energy savings among urban, semi-urban, and rural counties is shown in Table 7-2. It shows 81 percent of the value of energy savings achieved by participating households is occurring in urban counties. This can be compared to the 73 percent of all Wisconsin residents that live in the urban counties, thus indicating a larger share of the energy savings is occurring there (also observed in the FY07 analysis). However, as noted previously, this is due almost entirely to the fact that only 65 percent of rural residents are served by participating utilities, while 90 percent of urban residents are served by participating utilities. As shown in the table, the overall distribution of dollars saved actually tracks close to the distribution of eligible population.

The table also shows the average savings per household. It is important to note that this value represents the total savings among all participating households, divided by the total population residing in these areas. Thus, the higher average savings per resident of urban counties reflects the higher rates of eligibility and participation in those areas.

Table 7-2. Residential Participation and Energy Bill Savings

	Annual Dollars Saved	Percent of Dollars Saved	Eligible Customers	Percent of Eligible Customers	Savings per Eligible Customer
Urban	$66,515,734	81%	1,360,146	77%	$48.90
Semi-urban	$13,792,821	17%	333,809	19%	$41.32
Rural	$2,265,754	3%	67,404	4%	$33.61
Total known	**$82,574,309**	**100%**	**1,761,359**	**100%**	$46.88
Not known	$2,073,806				
Total	**$84,648,115**				

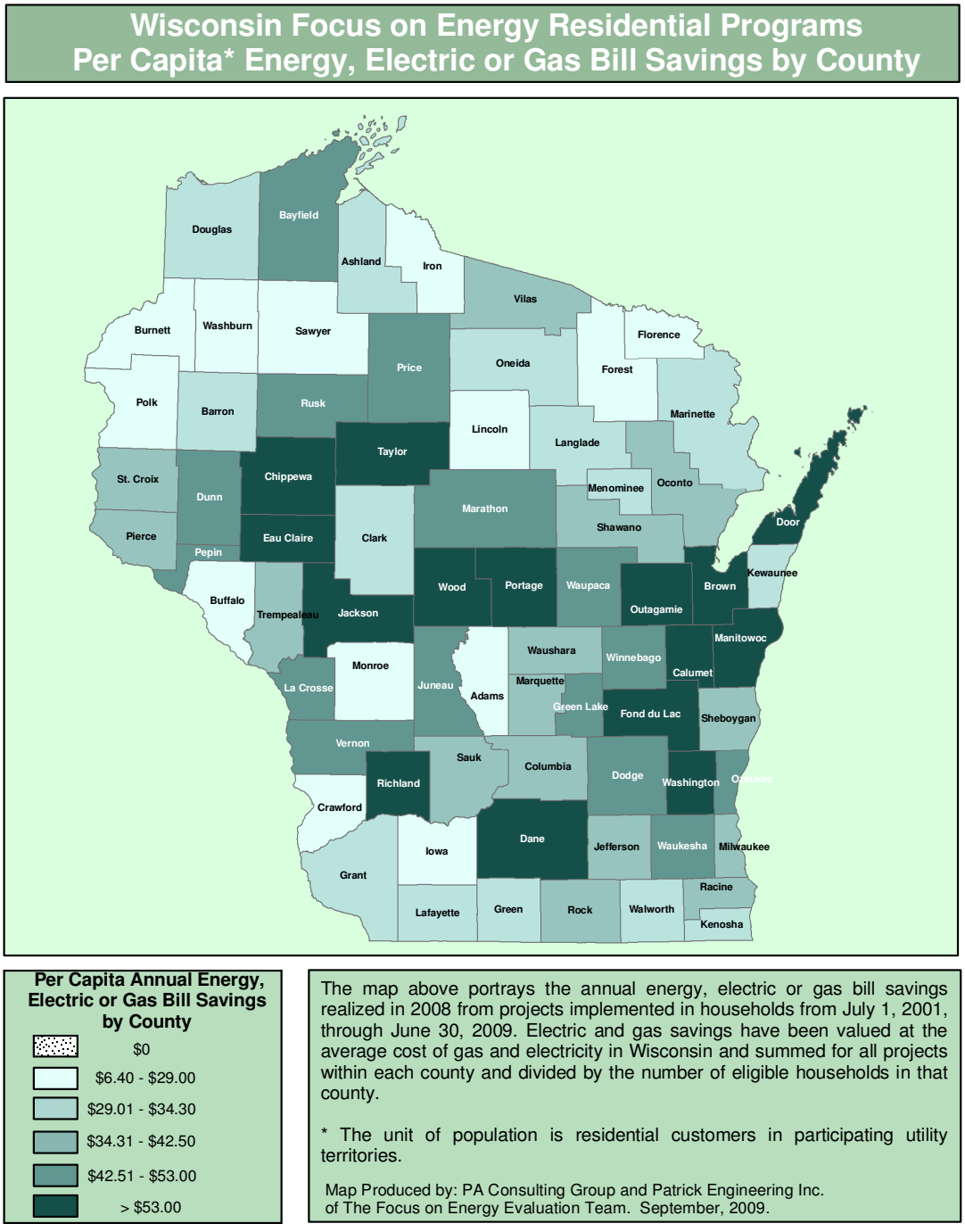
In Figure 7-2, energy bill savings are shown as "per capita" to show differences in the intensity of savings relative to the population in the county. The per capita value is derived by summing the annual energy bill savings from all participants in a county and dividing that sum by the number of eligible participants in that county. Since energy bill savings of residential participants is one of the key factors in generating economic impacts, this map provides a view of how the impact from that economic driver is distributed by county. The comparison of the percentage of counties that fall into each of the five per capita energy bill savings

[8] The Focus Evaluation Team. Focus on Energy Evaluation. Semiannual Report (First Half of 2009). October 19, 2009.

[9] The Focus Evaluation Team. Focus on Energy Evaluation. Semiannual Report (First Half of 2009). October 19, 2009.

categories shows that the urban counties are very highly concentrated in the upper end of the range, while there are no rural counties in the highest category.

Figure 7-2. Residential Program Energy Savings Per Capita, by County



7.4 FINDINGS—COMMERCIAL SECTOR BUSINESS PROGRAMS

The Focus commercial programs serve commercial organizations including commercial businesses (e.g., stores and offices) as well as public and private organizations (e.g., schools, churches, and government agencies). As of June 30, 2009 (the end of the state's 2009 fiscal year), the *gross* annual energy savings attributable to the Focus commercial programs had risen to $88,329,074. When converted to *net* annual energy savings valued at utility avoided cost, as adopted for the economic analysis, then its net value is calculated to $52,837,251.

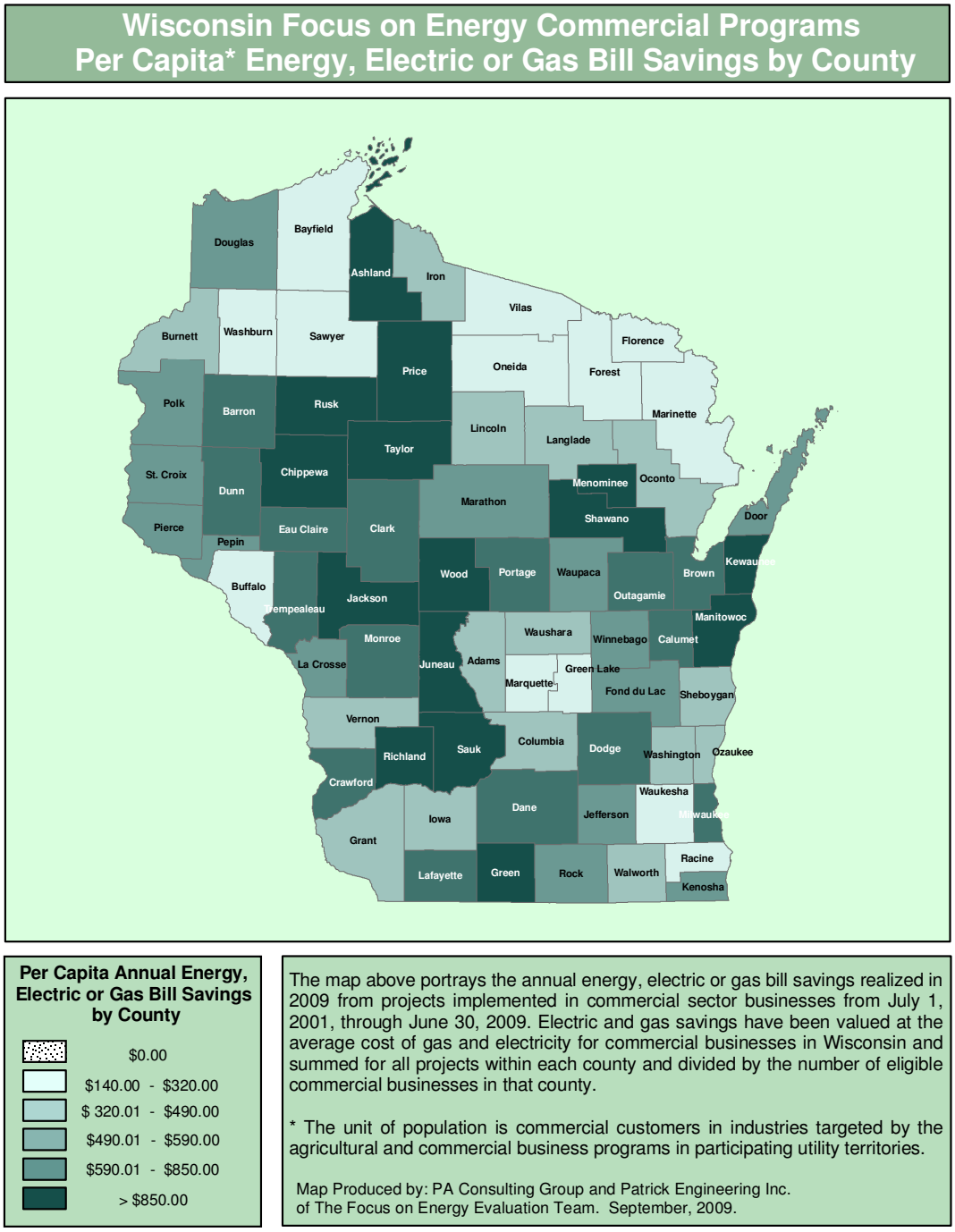
The distribution of the value of net energy savings among urban, semi-urban, and rural counties is shown in Table 7-3. It shows 72 percent of the value of energy savings achieved by participating commercial businesses is occurring in urban counties. This is significantly lower than the urban share of the residential program (81 percent). It indicates that the commercial programs have a broader distribution of benefits in semi-urban and rural areas, compared to the residential program. However, this distribution of dollars saving actually tracks very close to the overall distribution of eligible commercial and government customers.

Table 7-3. Commercial Participation and Energy Bill Savings (By County Type*)

	Annual Dollars Saved	Percent of Dollars Saved	Eligible Customers	Percent of Eligible Customers	Savings per Eligible Customer
Urban	$63,387,712	72%	109,293	72%	$579.98
Semi-urban	$20,986,168	24%	34,527	23%	$607.82
Rural	$3,955,193	4%	7,679	5%	$515.07
Total known	**$88,329,074**	**100%**	**151,499**	**100%**	**$583.03**
Not known	$0				
Total	**$88,329,074**				

In Figure 7-3, energy bill savings are shown as "per business establishment" to show differences in the intensity of savings relative to the number of eligible commercial business establishments in each of the counties. This value is derived by summing the annual energy bill savings from all participating establishments in a county and dividing that sum by the number of eligible establishments in that county. Since energy bill savings of commercial participants is one of the key factors in generating economic impacts, this map provides a view of how the impact from that economic driver are distributed by county. The comparison of the percentage of counties that fall into each of the five per capita energy bill savings categories shows that the rural counties are more concentrated in the lower end of the range. The highest category is still dominated by urban and semi-urban counties, but some rural counties are also represented.

Figure 7-3. Commercial Program Energy Savings Per Business, by County



The map above portrays the annual energy, electric or gas bill savings realized in 2009 from projects implemented in commercial sector businesses from July 1, 2001, through June 30, 2009. Electric and gas savings have been valued at the average cost of gas and electricity for commercial businesses in Wisconsin and summed for all projects within each county and divided by the number of eligible commercial businesses in that county.

* The unit of population is commercial customers in industries targeted by the agricultural and commercial business programs in participating utility territories.

Map Produced by: PA Consulting Group and Patrick Engineering Inc.
of The Focus on Energy Evaluation Team. September, 2009.

7.5 FINDINGS—INDUSTRIAL SECTOR BUSINESS PROGRAMS

As of June 30, 2009 (the end of the state's 2009 fiscal year), the *gross* annual energy savings attributable to the Focus industrial programs had risen to $84,608,670 (as shown in detail in Appendix A of the 2009 semiannual report[10]. When converted to *net* annual energy savings valued at utility avoided cost, as adopted for the economic analysis, then its net value is calculated to $50,765,202.

The distribution of the value of industrial net energy savings among urban, semi-urban and rural counties is shown in Table 7-4. It shows 36 percent of the value of energy savings achieved by participating industrial businesses is occurring in urban counties. This is significantly lower than the urban share of the residential program (81 percent) and the commercial program (72 percent). Compared to the actual distribution of eligible industrial businesses, these results show that the industrial programs have a higher distribution of firm benefits in semi-urban and rural areas compared to Focus' residential or commercial programs. Compared to the overall distribution of eligible industrial customers, these results also show that industries located in semi-urban and rural areas are also participating and realizing energy savings at a higher rate than their urban counter parts (similar to the FY07 analysis).

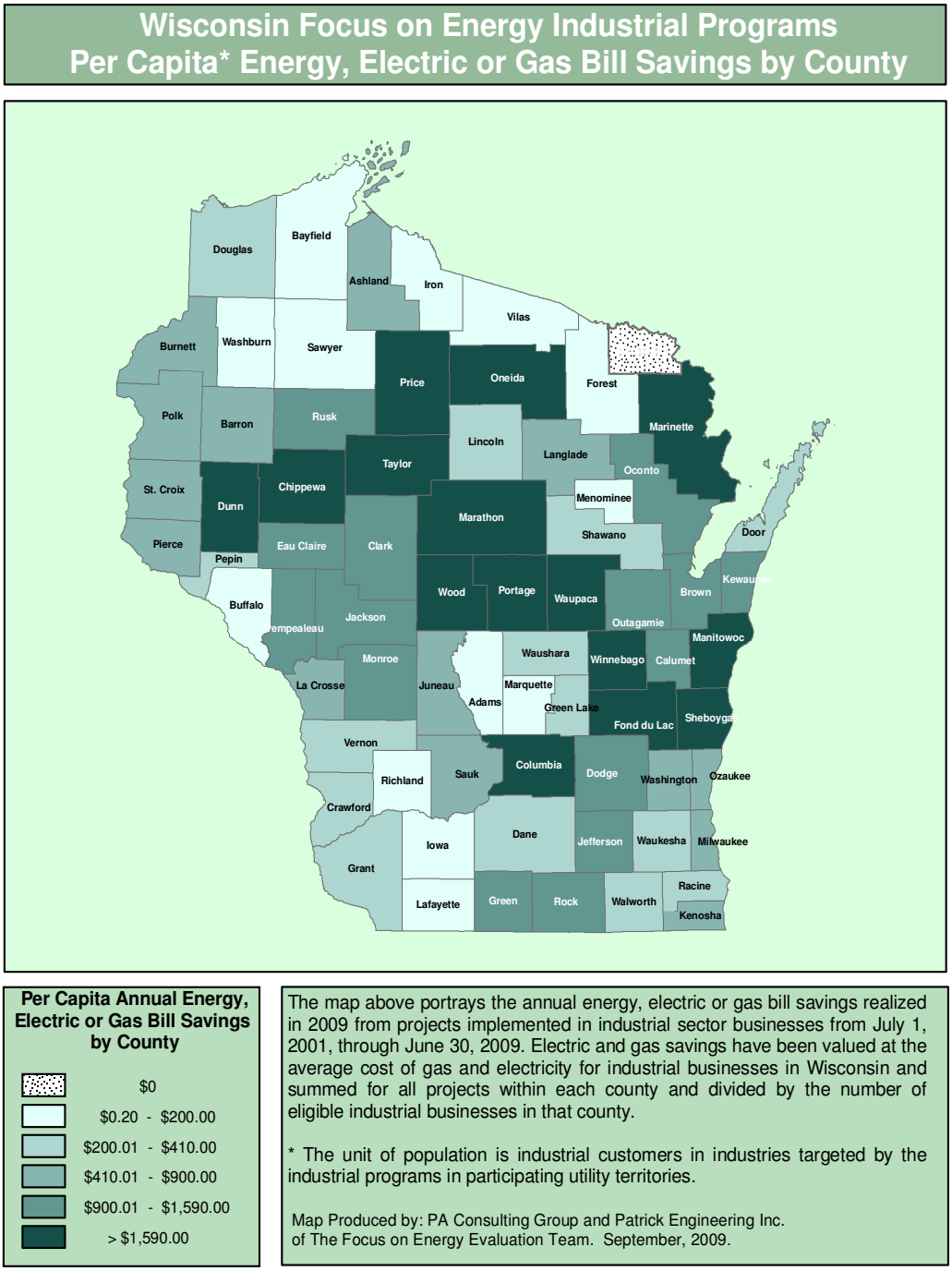
Table 7-4. Industrial Participation and Energy Bill Savings (By County Type)

	Annual Dollars Saved	Percent of Dollars Saved	Eligible Customers	Percent of Eligible Customers	Savings per Eligible Customer
Urban	$30,367,286	36%	33,333	42%	$911.03
Semi-urban	$30,064,071	36%	22,331	28%	$1,346.29
Rural	$23,131,303	28%	23,895	30%	$968.04
Total known	**$83,562,660**	**100%**	**79,559**	**100%**	**$1,050.32**
Not known	$1,046,010				
Total	**$84,608,670**				

In Figure 7-4, energy bill savings are shown as "per business" to show differences in the intensity of savings relative to the eligible industrial businesses in the county. The value is derived by summing the annual energy bill savings from all participants in a county and dividing that sum by the number of eligible participants in that county. Since energy bill savings of industrial participants is one of the key factors in generating economic impacts, the map provides a view of how the impacts from that economic driver are distributed by county. It also provides a comparison of the percentage of counties that fall into each of the five per capita energy bill savings categories. It shows that counties from all three county types are represented in the highest energy bill savings category.

[10] The Focus Evaluation Team. *Focus on Energy Evaluation. Semiannual Report (First Half of 2009).* October 19, 2009.

Figure 7-4. Industrial Program Energy Savings Per Business, by County



The map above portrays the annual energy, electric or gas bill savings realized in 2009 from projects implemented in industrial sector businesses from July 1, 2001, through June 30, 2009. Electric and gas savings have been valued at the average cost of gas and electricity for industrial businesses in Wisconsin and summed for all projects within each county and divided by the number of eligible industrial businesses in that county.

* The unit of population is industrial customers in industries targeted by the industrial programs in participating utility territories.

Map Produced by: PA Consulting Group and Patrick Engineering Inc.
of The Focus on Energy Evaluation Team. September, 2009.

7.6 RENEWABLE ENERGY PROGRAM

As of June 30, 2009 (the end of the state's 2009 fiscal year), the lifecycle verified *gross* annual impacts of the Focus renewable energy program had risen to $11,257,939 (Table 2-1a of the 2009 semiannual report[11]. When converted to *net* annual energy benefit valued at utility avoided cost, as adopted for the economic analysis, then its net value is calculated to be approximately $3,377,382.

The distribution of the value of net energy benefits among urban, semi-urban, and rural counties is shown in Table 7-5. It shows 27 percent of the value of energy savings achieved by participants is occurring in urban counties, while 74 percent is being achieved in semi-urban and rural areas. This result shows that the Renewables program has a higher share of activity in rural areas and a lower share in urban areas than any of the other focus programs.

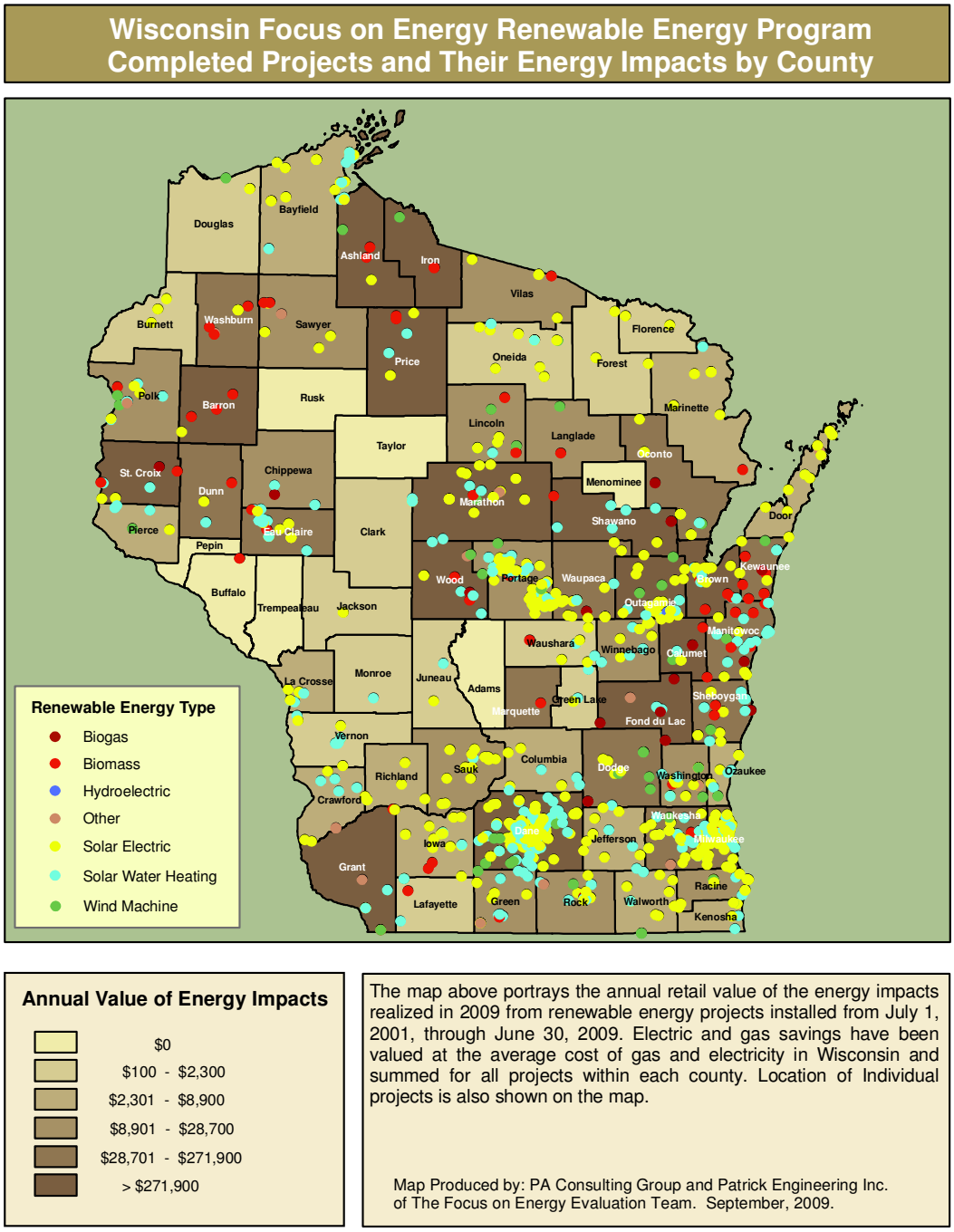
Table 7-5. Renewable Energy Participation and Energy Bill Savings

	Annual Dollars Saved	Percent of Dollars Saved
Urban	$3,011,899	27%
Semi-urban	$5,132,812	46%
Rural	$2,913,475	26%
Total	**$11,058,186**	**100%**

In Figure 7-5, the location of renewable energy projects is shown (colored *dots* depict the technology deployed) across the state's counties. The annual energy value (2009) for a county from the renewable investments made between 2001 and 2009 is denoted by the shading within the county's boundaries. It shows the broad distribution of renewable projects across the state and the substantial share of those projects occurring in rural and semi-urban counties.

[11] The Focus Evaluation Team. *Focus on Energy Evaluation. Semiannual Report (First Half of 2009).* October 19, 2009.

Figure 7-5. Renewable Energy Program:
Completed Projects and Their Energy Impacts by County



Annual Value of Energy Impacts

	$0
	$100 - $2,300
	$2,301 - $8,900
	$8,901 - $28,700
	$28,701 - $271,900
	> $271,900

The map above portrays the annual retail value of the energy impacts realized in 2009 from renewable energy projects installed from July 1, 2001, through June 30, 2009. Electric and gas savings have been valued at the average cost of gas and electricity in Wisconsin and summed for all projects within each county. Location of Individual projects is also shown on the map.

Map Produced by: PA Consulting Group and Patrick Engineering Inc. of The Focus on Energy Evaluation Team. September, 2009.

8. CONCLUSIONS

8.1 TOWARDS A MORE COMPLETE INTERPRETATION OF FINDINGS

The findings of this report are based on actual measured impacts of the first eight complete years of Focus operation. The report shows that all facets of Focus have impacts on the Wisconsin economy and that, overall, the programs are on their way towards generating and supporting new jobs and expanded businesses across the state.

That said, there is a remaining need to further carry these findings forward and apply them to provide policy insight into the efficacy of Focus as a statewide energy efficiency and renewable energy tool. If there is a desire to craft critical energy policy that is at the same time congruent with Wisconsin's currently evolving economic policy, such as with the recent *Clean Jobs Energy* Act, this type of economic assessment of Focus becomes even more relevant. The dialogue should continue to establish the relative role of economic development benefits in a context of broader program goals, and identify and apply benchmarks for assessing program impacts, relative to those resulting from alternative forms of energy and non-energy programs.

Initial efforts to address these three steps are summarized below and are supplemented with literature review and discussion material provided in Appendix C. This section and the appendix material should be viewed as initial steps towards progress in addressing broader policy issues, which will be continued in subsequent policy reports.

8.2 ROLE OF ECONOMIC DEVELOPMENT BENEFITS

Focus on Energy was set up with a series of policy objectives, including near-term resource acquisition and long-term market transformation for energy efficiency, environmental benefits, economic development benefits, electric system reliability, and stimulating the energy efficiency services industry. To assess overall program efficacy, it is necessary to consider and assess achievement towards all of these objectives.

That does not mean, however, that every program needs to be assessed equally in terms of achievement towards each of the policy goals. It is clear from this report that various programs within the Focus umbrella are differently oriented towards addressing specific goals, so it is possible to map programs to specific goals—including economic development goals. For instance, the analysis in this report showed that the Renewable Energy program is not designed to achieve the level of cost savings for its participants immediately, and hence does not generate short-term growth of Wisconsin's economy. However, the program is designed to stimulate the long-term growth of an industry (installing alternative generation technologies) that can also ultimately have economic development implications.

On the other hand, the analysis of residential programs in this report showed that they are designed to promote immediate cost savings and hence increases in statewide disposable income, as well as to support longer-term market effects. By matching Focus programs to specific types of short-term and long-term economic development impacts, we can (in the future) better track the relative success of these programs in achieving those goals.

8.3 MEASURES OF ECONOMIC DEVELOPMENT TARGETS

In general, economic development is a process of enhancing the state's economy by supporting the attraction, retention, growth, and diversification of business activity in the state. However, the nature of economic development needs differs by industry, by type of worker skill, by urban/rural location, and by area of the state. A key rule of economic developers is that their efforts should be targeted to those industries, types of workers, and areas where there is the greatest need to attract, retain, grow, and diversify economic activity.

It is also clear from this report that various Focus programs have different target audiences in terms of types of households and types of businesses (commercial, industrial, agricultural, and local government). They also differ in technologies that they address (from construction to lighting equipment), which means that each supports a unique pattern of demand for manufactured products, construction services, and/or installation services. This also translates into a unique mix of occupations and pattern of benefiting industries.

Together, these two observations indicate the value of further tracking the distribution of economic impacts are comparing them to various indicators of economic need, as reflected in Wisconsin statewide economic patterns and trends. While Focus programs are not fundamentally designed or optimized as a purely economic development program, there can be value in placing our findings on its economic development impacts into the context of statewide economic need. This can be addressed in future policy studies.

APPENDIX A: ECONOMIC MODELING PROCESS

A.1 ECONOMIC MODELS AND THEIR ENERGY APPLICATIONS

The application of economic impact models to measure impacts of programs and policies is widely used and accepted around the nation. Nearly all, if not absolutely all, of the states use such models. The specific application of these models for energy efficiency, renewable energy, and energy pricing policies is also widely applied and proven.

1. The most basic type of economic model is known as an "input-output (I-O) model"—an accounting table that traces the pattern of how households and industries buy from and sell to each other. This type of model is useful because it allows us to trace how changes in spending and business sales lead to indirect spin-off (or "multiplier") effects on other aspects of the economy. A statewide input-output model can also trace program impacts on the net flow of money going into and out of the state.

2. Input-output models have been used to assess the impacts of energy efficiency and renewable energy programs over a period of 20 years. Most of these studies used one of two input-output modeling tools—RIMS (developed by the US Department of Commerce) or IMPLAN (originally developed by the US Department of the Interior and now offered by a private sector spin-off). Applications of RIMS include studies for Nebraska, Florida, Wisconsin, and New York. Applications of IMPLAN include reports for Sacramento, Central Illinois, California, Ohio, Oklahoma, four Midwest states, and the nation. Applications using other I-O models include reports for California, the Pacific Northwest, British Columbia, Spain, and China.

3. A more advanced type of economic model is a policy analysis and forecasting simulation model, which combines an input-output mode with an additional ability to forecast shifts in prices, competitiveness factors, and business attraction over time. The REMI model (developed by Regional Economic Models, Inc.) is the most well known and widely used policy analysis and forecasting model in the United States. The REAL model (developed by Regional Economics Applications Laboratory of the University of Illinois) is another policy analysis and forecasting model, and has also been applied in a variety of studies for Midwestern states.

4. The REMI model has been used for the assessment of energy efficiency, renewable energy, and energy pricing policies for California, Wisconsin, Iowa, Wyoming, Massachusetts, New Jersey and the New England region. Other applications using the REMI model to assess impacts of regulatory changes and shifts in energy fuels and technologies were reports for Maine, Missouri, Illinois, Michigan, Connecticut, Vermont, New Jersey, Florida, New York, and the Midwest. The REAL model was also recently used to assess impacts of clean energy technologies for ten Midwest states.

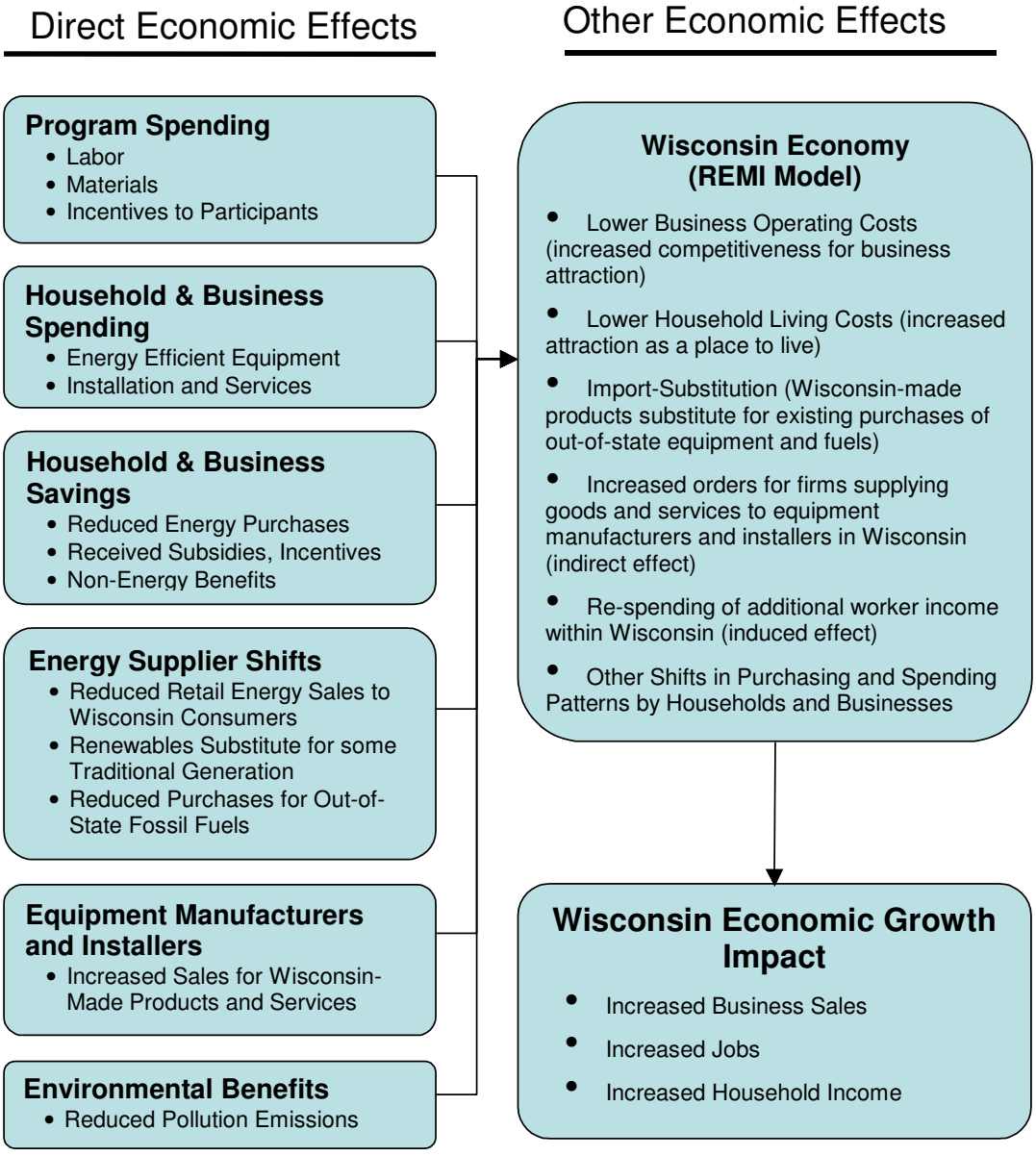
While there are differences in capabilities of the various types of models, they are generally consistent in their underlying structures and are built on similar foundations—(1) the inter-industry technology matrices and purchasing patterns provided in the US national input-output accounting tables, and (2) US Census and Commerce Department data on state and regional economic patterns. The findings on economic impact of energy programs are also generally consistent in showing that economic impacts will vary widely depending on the type

and magnitude of the program effort, the form of program assistance or intervention, the focus on specific technologies or economic sectors, the level of program participation, the breadth and nature of the program impact area, and time periods covered by the analysis.

A.2 ECONOMIC ANALYSIS PROCESS

REMI calculates the economic effects of Focus programs on the state economy by tracking the flow of dollars, changes in purchasing and sales patterns, and impacts on prices and costs resulting from the programs. This process is illustrated in Figure A-1 and discussed in the following text.

Figure A-1. Key Elements of Focus' Economic Development Impact



Source: EDR Group Renewables-Efficiency Economic Modeling (REEM)

A.2.1 Types of direct economic effects (inputs to the REMI model)

There are six categories of direct effects, which are input to the Wisconsin REMI model, as illustrated in Figure A-1.

- **Program spending**. The costs of implementing the Focus programs. This includes the costs of program administration and operation, the labor for installation and implementation of program energy saving measures, and incentives paid to participants.
- **Household and business spending.** Program participants pay a share of all measure equipment and installation costs. These costs are expenditures of business or household income that might have been used otherwise but produce positive results for the Wisconsin businesses that sell energy efficient goods and services. This also includes market effects—spending by households and businesses influenced by the programs to purchase energy-efficient equipment and appliances even if they do not do it through formal participation in the programs.
- **Household, business and public sector savings.** Program incentives decrease acquisition costs for participants' purchase of energy-efficient equipment and appliances by paying a portion of the difference in cost (incremental cost) between the price of standard-efficiency and energy-efficient equipment. Reductions in participant energy use lower energy bills freeing household income for other uses, making businesses more competitive and public-sector savings, such as at public schools are available for additional state and local program spending. Households can also realize non-energy benefits, such as increased water savings, decreased maintenance costs, increased property values.
- **Energy supplier shifts.** Reductions in participant energy use will result in some in-state reductions in retail energy sales and reduced importation of coal and other fossil fuels. The development of renewable energy electricity generation will substitute for some of the burning of coal and other fossil fuels. Electricity generation from renewable sources will provide a new revenue stream for farmers (farm biomass fuels) and may generate in-state manufacture and sales of photovoltaic and wind generation equipment.
- **Equipment manufacturers and installers.** Focus will produce increased demand for Wisconsin-made products and services. This spending buys energy-efficient equipment made in-state, such as motors, controls, cooling equipment. It also supports employment for insulation installers and other sorts of energy service providers. The evaluation to date has yet to quantify any efficiency benefits that accrue to various market providers. Once quantified, this aspect can also lead to subsequent economic impact generation.
- **Environmental benefits.** The value of reduced power plant emissions (resulting from reduced energy consumption of program participants) is cast as a reduction in generation costs for utilities in Wisconsin, which are assumed to be incurred by ratepayers. At present the evaluation can track two of four the primary emissions, sulfur and nitrogen oxides (SO_x and NO_x). Environmental analysis can estimate economic effects resulting from emissions reductions from the perspective of utility

companies but there are no agreed-upon standards for valuing the dollar impact of emissions reductions from the perspective of individuals.

It is important to note that there is a time dimension to each of these previously cited direct Focus program impacts. Program operation spending, as well as household and business spending, will occur in each year that the program is continued. However, each year of Focus operation will also produce a stream of energy savings benefits that will last for approximately the life of the energy savings measures installed by the program. This period differs by type of equipment and household or business type, but averages roughly 15 years. We also project that households and businesses will be influenced to install additional energy savings measures that will add to the stream of savings and add to the economic impacts. As a result, the economic impacts of Focus programs will have additional effects that continue for at least the life of the programs and likely longer.

It is therefore critical that the economic impact analysis examine impacts over an interval sufficient to reflect Focus programs in operation for ten years. Our analysis then follows program impacts over an additional fifteen years (the average lifetime of installed equipment), for a total analysis period of 25 years.

A.2.2 Types of intermediate effects (assessed within in the REMI Model)

There are six categories of resulting effects which are assessed within the REMI model, as illustrated earlier in Figure A-1.

- **Lower business operating costs (increased competitiveness for business attraction).** Focus programs lowers business operating costs by increasing energy efficiency, decreasing energy consumption, and possibly increasing productivity (where the program has influenced businesses to replace operating but obsolete equipment, for example). These effects are net gains to businesses. They can translate to increased profitability, increased productivity, increased ability to compete on price, and subsequent increases in payroll and taxes paid to the state.
- **Lower household living costs.** Increased energy efficiency resulting from participation in Focus can result in decreased electricity and heating bills. The purchase of some energy-efficient appliances such as dishwashers and clothes washers can have additional non-energy benefits, such as decreased water use and decreased sewer taxes, depending upon the jurisdiction. These lower costs free up income that would otherwise be spent on energy for other uses. Decreased energy costs in a climate of moderate to severe weather also increases the attractiveness of Wisconsin as a place to live.
- **Import substitution (Wisconsin products substitute for out-of-state purchases).** Wisconsin imports most of the fuels made to generate electricity and heat homes. Decreasing these demands reduces the need to import fossil fuels into the state. The development of electricity generation through renewable sources decreases some of the need for importation of fossil fuels that generate electricity in-state. This sort of substitution represents a net gain to the state's economy, since more dollars are spent in-state than previously.
- **Increased orders for Wisconsin firms (indirect effect).** This is an indirect effect of the program resulting from increased purchases of energy efficiency products and services going to Wisconsin firms.

- **Re-spending additional worker income (induced effect).** Wisconsin workers who benefit by increased demand for their labor increase their own income and in turn increase their spending in their home communities and in other businesses that operate within the state.
- **Other shifts in purchasing and spending.** Focus produces net gains in jobs and income throughout the state, directly and indirectly. The increased economic activity resulting from the programs' primary and secondary effects serve to strengthen the state's economy by increasing income while decreasing spending on imported goods and services.

Each of these intermediate impacts also has a time dimension. The household and business cost reductions, increased income, and import substitution impacts will continue to rise as energy savings impacts accumulate over time. As a result, the benefits of reduced costs of living and increase business competitiveness will continue for decades beyond the assumed program period.

A.2.3 Calculation of economic model results (forecast by REMI)

The REMI analysis system then assesses total economic impacts of the preceding factors by applying a large series of economic relationships representing changes in inter-industry purchasing and sales transactions and long run equilibrium responses over time. These responses include changes in energy and other factor costs faced by households and businesses, as well as broader changes in labor demand and supply, wage rates, production costs and profitability, disposable household incomes, the proportions of local demand met by local production, investment demand, population shifts, and market shares of national economic growth.

The end result is that the REMI model forecasts year-by-year changes in four key types of results on the Wisconsin economy:

- **Business sales.** Increasing output and hence sales volume of goods and services provided by Wisconsin firms. This is shown by industry type.
- **Gross regional product (GRP).** This is calculated as the value added portion of business sales, which is the business sales minus cost of materials. It essentially represents the sum of worker income and corporate (profit) income.
- **Jobs.** The number of jobs (both salaried workers and self-employed individuals) that is generated by expansion in business sales.
- **Real after-tax income.** Household disposable income reflects the direct program savings in any given year as well as the after-tax wage income that results from the state's economy experiencing a positive growth response under Focus. Since the latter source of household income comes from a portion of the business sales, the income benefit ***cannot*** be added to the business expansion or GRP benefit.

A.3 ECONOMIC ANALYSIS ASSUMPTIONS AND LIMITATIONS

A.3.1 Assumptions

Performing an economic analysis requires making a number of assumptions about what Focus activities will look like over an extended timeframe. Following are some of the important assumptions that were made in advance of analyzing programs' economic impacts. In general we made conservative assumptions to avoid over-estimating the programs' effects.

- For purposes of analysis, it was assumed that the Focus programs are offered for ten years, while program impacts were observed for 25 years. There are two reasons for this. First, it is necessary to assess program operations impacts for more than one or two years, so that we can observe the cumulative benefit of growing participation and market effects over time. Second, it is necessary to assess energy savings over a period over the lifetime of installed equipment, which averages approximately 15 years beyond the time of the last participant joining the program.
- For the Residential and Business Programs "market effects" estimates were developed based on information provided by program administrators and additional projections made by program evaluators. Market effects estimate the extent to which Focus influences customers to make purchases of energy-efficient equipment they might not have otherwise made. Market effects factors are derived from Focus evaluation survey data and estimates made by knowledgeable practitioners.

A.3.2 Limitations

Economic analysis does not capture some types of program benefits at all or captures them incompletely.

A good example of this is calculating economic benefits of decreasing emissions of atmospheric pollutants such as mercury, sulfur oxides (SO_x), nitrogen oxides (NO_x), and carbon dioxide. Decreasing emissions of these pollutants benefits health and improves other quality-of-life concerns, but it is currently difficult or impossible to quantify those impacts from the perspective of individuals living in the state.

It is possible to quantify the value of some avoided emissions by looking at their value in pollution trading credit markets. However, the pollution credit trading markets involve utility companies, not individuals. The scale of utility operations statewide is so large that the economic benefits derived from reducing emissions, though significant in themselves, do not register well in the model. Carbon dioxide reductions due to the program are significant but trading markets are only just being organized and we cannot currently place a value on reducing CO_2 emissions, even from the utility perspective.

APPENDIX B: IMPACTS BY KEY DRIVING FACTORS

This appendix describes how we defined and calculated each of the key factors (direct effects) that enter into the economic model, and it then shows, for select years, the contribution of each of those factors to total economic impacts.

B.1 ENERGY COST SAVINGS

Energy cost savings represent the additional disposable income realized by households and the additional retained income realized by businesses as a result of installing program-supported measures that decrease energy use. Energy savings continue through the life of the program and beyond, to the end of measure lives of efficient equipment installed or purchased through the program, or whose purchase was influenced by the program.

Energy savings accrue cumulatively (after persistence loss) to participating business and institutional establishments as a reduction in the relative cost of doing business in Wisconsin—a positive effect on the economy. Over the ten-year period analyzed, new savings are generated each year, creating streams of savings that peak in the tenth year. For participating state and local government offices, energy savings are assumed to free up dollars for more public spending. Table B-1a shows the value of these savings from all Focus programs, and Table B-1b shows the resulting *total economic impacts* that result.

Table B-1a. Avoided Energy Cost Savings, Historic Scenario*

Historic No Market Effects ($ mil 2009 basis)	Year 1	Year 5	Year 10
Avoided cost *savings*	$3.79	$68.06	$238.74

Table B-1b. Economic Impact from Energy Savings, Historic Scenario*

	Jobs	Business Sales*	Value Added*	Real Disposable Income*
Year 1	39	$3.4	$2.0	$1.4
Year 5	1,003	$95.6	$82.1	$49.6
Year 10	3,698	$416.1	$314.0	$213.1
Sum: Years 1–10	**14,438**	**$1,513.9**	**$1,177.9**	**$777.8**

* $ are in millions of constant 2009

excludes market effects

B.2 HOUSEHOLD AND BUSINESS PARTICIPANT COSTS

Household and business costs consists of the spending for the incremental costs between standard efficiency and high efficiency equipment, renewable energy systems and/or replacement of existing equipment before the end of their lifetimes. Since these are additional costs, their net economic impact is negative (Table B-2b). These costs are shown in Table B-2a and reflect incentive dollars that help to defray the net *incremental cost*. Note: for those programs for which market effects were estimated, additional household and business

spending to purchase additional energy efficiency measures was assumed to be proportional to spending by program participants.

Firms are assumed to amortize the additional cost of purchasing and installing energy-saving equipment over the useful life of the equipment. Partially offsetting the loss of income associated with bearing these costs, some of the spending will go back to Wisconsin businesses in the form of increased sales for various types of electrical equipment, machines and computers, instruments and building materials, as well as construction and professional engineering services (presented next in B.3). This growth in Wisconsin-based business sales is, however, also diminished slightly by a reduction in spending on electricity and gas purchases, which reduces business sales for Wisconsin utilities.

Table B-2a. Net Incremental Household and Business Costs*

Historic No Market Effects ($ mil 2009 basis)	Year 1	Year 5	Year 10
Participants' *net* incremental cost burden	$17.72	$51.38	$88.28

Table B-2b. Economic Impact from Household and Business Costs of Participating*

a	Jobs	Business Sales*	Value Added*	Real Disposable Income*
Year 1	-183	-$15.7	-$9.3	-$6.6
Year 5	-682	-$65.0	-$55.9	-$33.7
Year 10	-1,271	-$143.0	-$107.9	-$73.2
Sum: Years 1–10	**-7,653**	**-$780.9**	**-$585.3**	**-$383.8**

* $ are in millions of constant 2009

excludes market effects

B.3 PROGRAM SPENDING

Program-related spending consists of all the goods and services purchased by the program and its participants over its life. Public program spending derives from public benefits charges paid by Wisconsin ratepayers, whereas households and businesses contribute the *net* incremental investment for their installations net of any incentives offered.

Values for the program budget and total program spending are included in the model and shown in table B-3a. These are dollars of new demand fulfilled by businesses within or outside of Wisconsin. We assumed there would be an approximately constant mix of labor, travel expenses, and materials costs. Program spending generates jobs and business sales in Wisconsin—a positive effect on the economy. Table B-3b shows program spending impacts.

Table B-3a. Program-related Spending (New Demand)*

Historic No Market Effects ($ mil 2009 basis)	Year 1	Year 5	Year 10
Program-related purchases	$32,475,098	$91,663,864	$206,149,165
Program administration	$18,501,891	$15,702,496	$32,772,817
Participant purchases	$13,973,207	$75,961,368	$173,376,347

Table B-3b. Economic Impact from Program Spending*

	Jobs	Business Sales*	Value Added*	Real Disposable Income*
Year 1	591	$36.4	$28.6	$22.0
Year 5	989	$63.0	$44.1	$41.1
Year 10	2,192	$135.5	$94.4	$87.3
Sum: Years 1–10	**13,242**	**$863.1**	**$609.8**	**$540.0**

* $ are in millions of constant 2009

excludes market effects

B.4 ENVIRONMENTAL BENEFITS

The economic analysis also considered some environmental impacts of the Focus programs as a whole. The Focus programs' energy impacts have associated reductions in electricity power plant emissions. For this analysis, we have described some of the impacts of nitrogen and sulfur oxides (NO_x and SO_2) emissions results with respect to their impacts on utility generation costs for power generators within Wisconsin. Within this limited scope, though the reductions were significant accomplishments, their economic effects statewide were found to be minimal in this context. However, this analysis did not look at the economic effects of other environmental impacts that affect individuals directly, such as effects on health. This is a separate issue that should be addressed by the evaluation team and PSC staff (e.g., identification and application of an appropriate damage function that establishes dollar values for the externalities associated with the burning of fossil fuels for electricity generators supplying Wisconsin).

It is important to recognize that while the economic analysis does not capture some types of program benefits at all, particularly quality of life benefits, there are some benefits which are captured incompletely. One example of this is the calculation of economic benefits resulting from decreases in electric generation pollutant emissions (NO_x, SO_2, and mercury) and greenhouse gas emissions (CO_2). It is possible to quantify the value of some avoided emissions by looking at their value in pollution trading credit markets (shown in Table B-4a) and gauge the reduction in generating costs and then measure the economic impacts when those savings are passed along to electric customers (Table B-4b).

In this economic analysis, the scale of utility operations statewide is so large that the economic benefits derived from reducing emissions, though significant in themselves, barely register in the model. This is the case for the NO_x and SO_2 pollutants, which have US markets where credit trading clearing prices have been applied. However, with no US carbon credit market it is more speculative to assign a monetary value; this is unfortunate because the scale of avoided CO_2 currently estimated to be attributable to Focus programs is significant.

Table B-4a. Value of Avoided Emissions (NO_x, SO_x, and Mercury)*

Historic No Market Effects ($ mil 2009 basis)	Year 1	Year 5	Year 10
Value of avoided emissions	$77,257	$4,064,573	$8,656,360

Table B-4b. Economic Impact from Lower Emission Compliance Costs*

	Jobs	Business Sales*	Value Added*	Real Disposable Income*
Year 1	1	$0.1	$0.0	$0.0
Year 5	60	$5.7	$4.9	$3.0
Year 10	134	$15.1	$11.4	$7.7
Sum: Years 1–10	**607**	**$62.9**	**$49.1**	**$32.2**

* $ are in millions of constant 2009

excludes market effects

B.5 NON-ENERGY BENEFITS

This report includes some estimations of the economic impacts of non-energy benefits that are economic (i.e., reflect a change in some aspect of how money flows in Wisconsin) of the Residential, Business and Renewable (limited to the biogas projects) programs, including such items as the impacts of increased ability to pay bills, fewer shutoffs and service calls, decreased maintenance costs, decreased water and sewer costs, and so on.

Table B-5a. Value of Non-energy Benefits*

Historic No Market Effects ($ mil 2009 basis)	Year 1	Year 5	Year 10
Value of non-energy benefits	$2,127,481	$9,595,003	$17,420,744

Table B-5b. Economic Impact from Non-energy Benefits*

	Jobs	Business Sales*	Value Added*	Real Disposable Income*
Year 1	22	$1.9	$1.1	$0.8
Year 5	141	$13.5	$11.6	$7.0
Year 10	270	$30.4	$22.9	$15.5
Sum: Years 1–10	**1,532**	**$157.6**	**$119.5**	**$78.7**

* $ are in millions of constant 2009

excludes market effects

APPENDIX C: GREEN JOB DEFINITIONS

This appendix provides an overview of the range of "green job" definitions used by outside groups around the United States. It provides a background basis for the specific definition developed for the Focus context, and describes how the "direct" jobs that emanate from Focus programs are identified (by type and number). Both are needed in addressing the "green job" implications presented in Section 6.3 of the main report on economic development benefits.

C.1 ELEMENTS OF GREEN JOB DEFINITIONS

There is wide variation among groups and individuals regarding the definition of "green" jobs. This is a consequence of the original of the "green" concept, which traces back several decades to the green movement that has at various times espoused a broad set of sustainable ecological, social, and economic goals, including:

- **Energy resources.** Minimizing natural resource depletion, by reducing use of non-renewable energy resources and increasing use of renewable energy resources
- **Environment.** Minimizing impact on air and water quality by reducing emissions of compounds that contribute to health problems and climate change
- **Waste.** Minimizing impact on soil quality and drinking water by reducing generation of solid waste and contaminants, and increasing recycling
- **Economy.** Maximizing well-paying local jobs and minimizing transportation resource use, by increasing use of locally-made products and services
- **Social.** Maximizing social justice, equal opportunity and related goals.

In practice, the term "Green Jobs" is used inconsistently among interest groups, while yet others refer to "Green Collar Jobs." Many define the two terms as interchangeable, while some make a distinction. For instance, Green for All, a non-profit organization that assists in training low-income individuals for jobs in a clean energy economy, describes the difference between the two as follows:

> "'*Green job' refers to any job that contributes to preserving or enhancing environmental quality. Some green jobs are also green-collar jobs: blue-collar jobs that have been upgraded to respect the environment. These are family-supporting, career-track jobs open to people without high levels of education*[12]*."*

With the US Congress's passing of the Green Jobs Act of 2007 and national emphases on improving the environment, a particularly varied and broad set of definitions have arisen regarding green jobs and/or green collar jobs. From these definitions, funding requests are

[12] http://www.greenforall.org/resources/green-collar-jobs-resources.

made with states and/or businesses declaring the number of green jobs their organization provides. The Green Jobs Act of 2007 was defined as a way to:

- "…train American workers for jobs in the renewable energy and energy-efficiency industries – industries that are key to US and world efforts to combat global warming."
- "…support both our nation's innovation and technological leadership and lift people out of poverty[13]."

C.2 SCAN OF ALTERNATIVE DEFINITIONS

To illustrate the range of definitions, it is useful to view how various organizations have made their own definitions. A scan found sixteen groups with differing definitions that spanned nine distinct goal or solution elements. The table below lists these elements and the number of different organizations that included it in their own definition of "green jobs." It is notable that these elements include both (1) different types of goals (e.g., energy, waste, resource use, social) and (2) different types of solutions (e.g., equipment technology, fuels, transportation modes, training/education and behaviors affecting achievement of those goals).

Table C-1. Elements of Green Job Definitions Used by Different Organizations

Elements Included in "Green Job" (or "Green Collar") Definitions	Number of Organizations Including that Element in Its Definition
Renewable energy	9
Reduce waste/pollution/emissions	8
Help environment	8
Energy efficient products	7
R&D – clean technology	5
Biofuels	6
Efficient buildings and retrofits	6
Jobs, training, and support	5
Transit/transportation/freight	5
Decent wages and benefits	5
Social/economic justice	4
Efficient manufacturing	4

The majority of the "green job" descriptions included references to renewable energy such as wind, solar, hydro, geothermal, and bio-fuels. Other definitions were more general such as reducing pollution or helping the environment. For definitions referring to existing energy production and usage, many highlighted an improvement in effectiveness or efficiency that is applied to buildings, transportation (passenger and freight), and/or new "clean" technologies. Job creation and training, often considered to be more aligned with workforce development, was also included in the definition of a green job by five organizations. The table that follows shows the specific elements included in the green job definitions of these sixteen organizations.

[13] http://solis.house.gov/list/press/ca32_solis/wida6/greenjobsaug4.shtml.

Table C-2. Elements Used in the Definition of Green Jobs

Organization Defining Green Jobs *(see Table C-3 for more detailed information)*	Renewable Energy	Reduce Waste/Pollution	Help Environment	Energy Efficiency Products	Biofuels	Energy Efficient Building	R&D - Clean Technology	Provide Jobs/Training/	Public Transit	Decent Wages/Benefits	Social Justice/Poverty	Sustainable/Efficient Mfg.	Smart Grid	Conserve Energy/Water	Social Investments	Can't be Outsourced	Organic Products	Admin Environ Programs
United Nations Environ. Programme	X	X	X	X	X	X	X		X			X		X				
Green Career Central		X	X			X	X	X		X	X				X			
Bright Green Talent	X	X		X			X		X	X			X					
Green For All	X	X	X		X			X	X	X								
Apollo Alliance	X					X		X	X				X		X			
Center for American Progress	X			X	X	X					X	X						
US House of Representatives	X			X	X	X					X						X	
Pew Charitable Trusts		X		X			X	X						X				
Univ. of Massachusetts, PERI	X	X		X	X													X
US Conference of Mayors	X			X	X	X												
PA Dept of Environmental. Protection		X	X						X			X						
American Public Transportation Assn.			X					X		X								
In These Times magazine		X	X									X						
Blue Green Alliance			X							X						X		
Senator Baucus, Montana	X						X											
Laborers Intl. Union			X								X							
	9	8	8	7	6	6	5	5	5	5	4	4	2	2	2	1	1	1

Table C-3. Backup Information for Cited Organizations

Organization	Description/Citation
United Nations Environment Programme	UN program to engage international groups through expertise. www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf
Green Career Central	Membership site for people to transform their passion for the environment into a prosperous green career; see www.greencareercentral.com/public/402.cfm
Bright Green Talent	Environmentally-focused search firm; "Green Jobs Reality and Rhetoric," by Nick Ellis, Feb. 13th, 2009. www.greenbiz.com/blog/2009/02/13/green-jobs-reality-and-rhetoric
Green For All	National organization to build an inclusive green economy strong enough to lift people out of poverty www.greenforall.org/resources/green-collar-jobs-overview
Apollo Alliance	Coalition of labor, business, environmental, and community leaders to catalyze a clean energy revolution. apolloalliance.org/apollo-14/the-full-report/
Center For American Progress	Think tank dedicated to improving the lives of Americans through ideas and action. www.americanprogress.org/issues/2009/09/clean_energy_investment.html
US House of Representatives	Green Jobs Act of 2007 solis.house.gov/list/press/ca32_solis/wida6/greenjobscomm.shtml
Pew Charitable Trusts	Promotes nonpartisan solutions for problems affecting America and the global community, Report: *The Clean Energy Economy, 2009.* www.pewcenteronthestates.org/uploadedFiles/Clean_Economy_Report_Web.pdf
University of Massachusetts, Political Economy Research Institute	Promotes human well-being through original research; Report: *Green Recovery*, 2008. www.peri.umass.edu/green_recovery/
US Conference of Mayors, Climate Protection Center	Provides mayors with guidance and assistance to reduce the greenhouse gas emissions linked to climate change; see www.usmayors.org/pressreleases/uploads/GreenJobsReport.pdf
Pennsylvania Department of Environmental Protection	State-level environmental office, speech by Kathleen McGinty, Secretary. www.yourgreencareer.com/tipoftheweek/2008/03192008.html
American Public Transportation Association	Focuses on improving the efficiency and accessibility of public transportation; see newsmanager.commpartners.com/aptapt/issues/2009-05-11/10.html .
In These Times	Newsmagazine opposed to the dominance of transnational corporations; see article Just What Is a "Green Job" Anyway? By C . Weber, March 25, 2009 www.alternet.org/environment/132139/just_what_is_a_%22green_job%22_anyway/?page=entire
Blue Green Alliance (Just What is a Green Job?)	A strategic partnership between labor unions and environmental organizations dedicated to expanding the number and quality of jobs in the green economy; see www.workforce.com/section/00/article/26/16/79.php
Senator Baucus, Montana	US Senator www.workforce.com/section/00/article/26/16/79.php
Laborers' International Union of North America	Union of construction workers, also representing public service employees. www.workforce.com/section/00/article/26/16/79.php

Other sources citing the green job definitions by the above organizations:
www.time.com/time/health/article/0,8599,1809506,00.html
www.sustainableindustries.com/energy/36399419.html?viewAll=y
www.telegraph.co.uk/finance/jobs/5090919/Green-jobs-bringing-colour-back-to-the-economy.html.

C.3 ISOLATING "DIRECT" JOBS ATTRIBUTABLE TO FOCUS ON ENERGY

The discussion of "green job" requirements associated with the Focus program centers on the *first-round* of in-state employment needed to deliver the program, install energy-efficient projects, and manufacture some portion of the components for energy-efficient systems. The *first-round*, also referred to as the *direct* jobs (since they directly emanate from the existence of Focus activities) is where we can credibly address the "green" attributes of the jobs required.

We isolate the number of *direct* jobs and in what industries they occur by examining the type of spending created by program administration, participants' investments, and installation needs in our horizon year (2011). The nature of the spending is *mapped* into a set of industries which likely provide the good or service needed. In some cases this spending is entirely fulfilled by Wisconsin businesses, in others, less so. Program evaluators assisted in this determination. The economic impact modeling system that is used to drive the information in this report offers a state-level calibrated database. From this system we can harness industry-specific *regional purchase coefficients* (RPCs) which provide an indication of how often a Wisconsin business fulfills new demand arising in the state (as opposed to having imports fulfill those spending streams). From *Focus*-related spending (new demand in Wisconsin) to dollars of new sales[14] from Wisconsin businesses, the *sales-per-worker* by industry (also referred to as labor productivity in the REMI economic model of Wisconsin) converts the new sales into *number of additional jobs*. It is this set of additional jobs that are further scrutinized for degrees of "green" attributes.

[14] In cases of direct payments to labor for program administration or the labor component to project installation (involving the construction contractors, or service technicians/auditors) dividing by the *annual compensation-per-worker* provides an estimate of how many positions are required.