

City of Ellensburg Energy Efficiency & Conservation Strategy

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Executive Summary

The Energy Efficiency & Conservation Strategy (EE&CS) is a planning document intended to provide guidance and structure to the City of Ellensburg (City) as it continues its efforts to reduce overall energy consumption, thereby fostering cost savings, economic development, and long term sustainability. The document briefly describes the foundation and process for EE&CS development, as well as a 'snapshot' of relevant existing conditions. However, its primary function is as a future-looking document, and includes a current understanding of the community's EE&CS vision and goals, as well as its preferred focus areas and strategies. In addition, the report presents case studies for selected strategies of interest to the community, as well as planning tools for identifying and implementing strategies, and for tracking and measuring progress.

There are many indirect environmental benefits to energy efficiency and conservation strategies, such as improved air quality, water quality, and water conservation; however, the primary focus of this Strategy is to provide guidance to the City on achieving, measuring, and reporting energy efficiency and conservation. When relevant, these indirect benefits are noted in the Strategy, but a discussion of these benefits and their relationship to specific energy efficiency and conservation measures is beyond the scope and purpose of this Strategy.

The EE&CS was vetted in public meetings, including the Utility Advisory Committee (UAC) and City Council study sessions and meetings, with the intent of obtaining Council approval of the EE&CS by the end of 2011. EE&CS Development was funded through the American Recovery and Reinvestment Act by the US Department of Energy and administered through the Energy Policy Division of the Washington State Department of Commerce under the Energy Efficiency and Conservation Block Grant No. DE-EE0000849.

The EE&CS development approach entailed building on existing initiatives, identifying code barriers to implementing energy efficiency and conservation strategies and recommending solutions, and identifying additional strategies that make sense given community interest, available resources, and potential impact. As part of the process, it became clear that City Council and Staff were interested in a strategic document that provided background and an infrastructure for future decision-making, rather than a set of recommended strategies to be adopted and implemented. As such the document is considered a "living document" providing flexibility to the City as it moves forward.

City Council, the Utility Advisory Committee, City Staff, and key stakeholders from the local development and building community, the business community, environmental/energy activists, Kittitas County and Puget Sound Energy (PSE) took part in development of the EE&CS. In particular, the community-at-large provided input through a public survey, two community workshops, and comments on the draft of this document.

EE&CS development included the consideration of several research questions:

- Are there models that Ellensburg can draw from to develop the EE&CS and corresponding implementation strategies?
- How much energy is being consumed and generated by the City and its citizens today, and how does that compare to national or regional benchmarks?
- What efforts to improve energy efficiency and increase the use of renewables are already in place and what have they accomplished?
- What code barriers to achieving energy efficiency improvements exist and how can they be remedied or mitigated?

- What additional strategies would build on existing efforts to address community priorities and achieve the community's energy efficiency and conservation goals?

Although research for the EE&CS indicates that the City of Ellensburg has made significant efforts in regard to energy efficiency, conservation and the use of renewables, it has also identified significant opportunities for further improvement in the focus areas of: transportation; economic development; green buildings and infrastructure; existing buildings; renewable energy; energy access and equity; and energy efficient development and smart growth. These focus areas relate nicely to the four goals that emerged from the public process:

1. **Maintain City leadership role in energy conservation and renewable energy production.**
2. **Ensure City codes and policies foster energy conservation and the production of renewable energy.**
3. **Create community-wide opportunities for energy conservation and renewable energy production.**
4. **Maximize the benefits of existing Tier 1 power pricing.**

Figure 1 correlates key focus areas with the four goals identified during the public process.

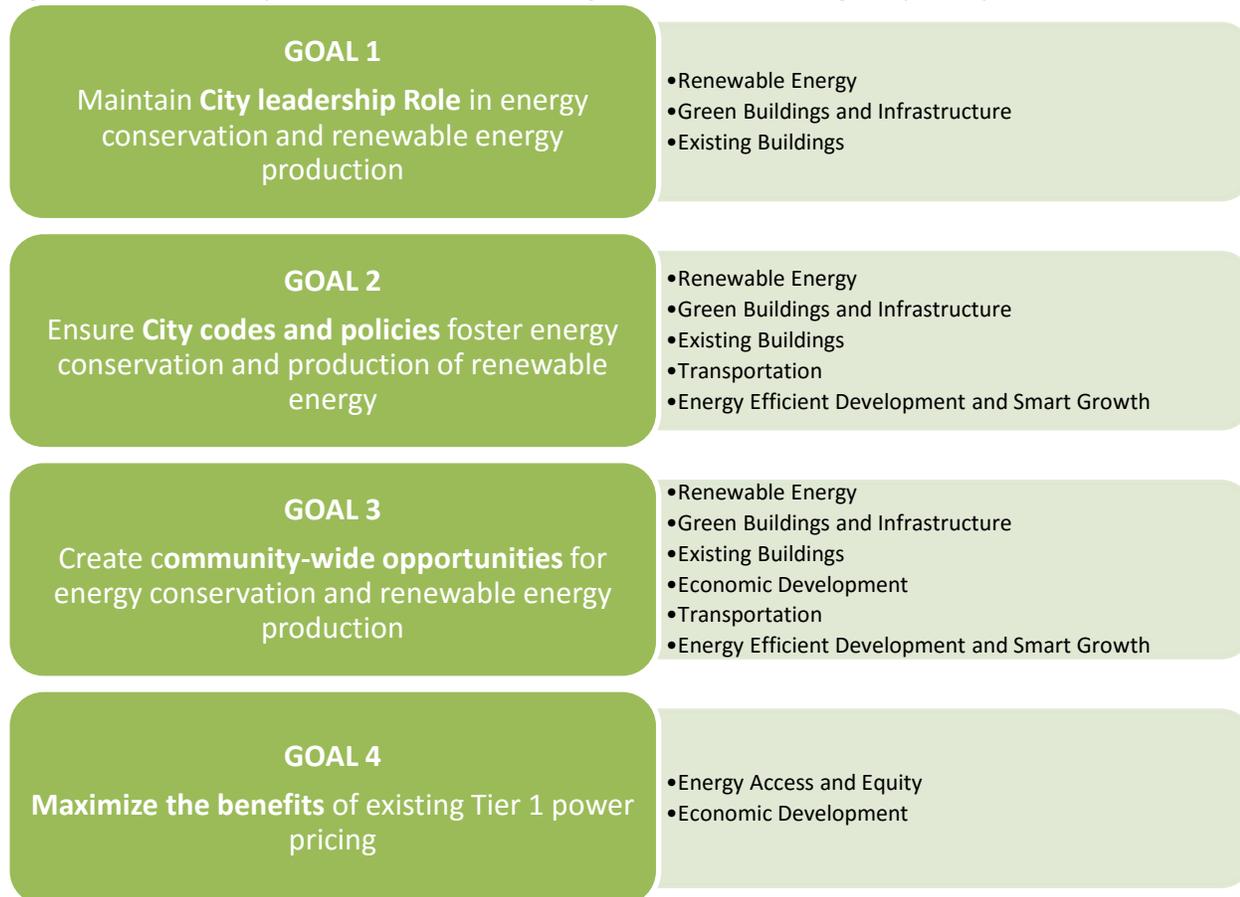


Figure 1. Focus areas (on the right) are aligned with corresponding goals identified during the public process.

Together these goals aim toward a common idealized vision for Ellensburg to be:

“A community that fosters resource sustainability and economic development through energy efficiency and the use of renewable energy.”

Alongside this visionary path are three thematic concerns regarding implementation of specific strategies that were clearly expressed by the community as a whole:

Maintain what's Right

- Keep the small town, rural character
- Celebrate and preserve the area's natural resources

Increase and Improve where Needed

- Create a more vibrant, thriving downtown core
- Increase the breadth of actions – bring diversity to energy conservation and renewable strategies

Inspire, but Validate

- Focus on voluntary and incentivized actions instead of mandatory ones
- Showcase the financial bottom line of selected strategies

Ideas for implementation strategies that emerged from the community and subsequent research are provided for each of the focus areas that tie in to the goals and meet the thematic implementation concerns of the community as a whole. Case studies for several ideas that have particular merit and interest focus on conducting a community-wide energy challenge and/or competition, creating a green building and/or business program, conducting an energy neighborhood or district initiative, and expanding the electrical vehicle infrastructure. Since the EE&CS document is intended to be a planning tool rather than a plan, templates have been developed for the City and community as a whole to consider individual implementation strategies. As individual strategies are considered, it will be important to consider how these strategies interact, including synergistic benefits or conflicting effects.

Measuring progress is key to the success of any Strategy, and the EE&CS document provides a great deal of information about where Ellensburg is today in its efforts (including how it compares to national data). Best practices on setting objectives, indicators, and appropriate timelines are provided in the Strategy. Ellensburg has made great strides and is perfectly poised to take its next steps towards its vision of fostering "resource sustainability and economic development through energy efficiency and the use of renewable energy."

I. Introduction

The Energy Efficiency & Conservation Strategy (EE&CS) is a planning document intended to provide guidance and structure to the City of Ellensburg (City) as it continues its efforts to reduce overall energy consumption, thereby fostering cost savings, economic development, and long term sustainability. The document briefly describes the foundation and process for EE&CS development, as well as a "snapshot" of relevant existing conditions. However, its primary function is as a future-looking document, and includes a current understanding of the community's EE&CS vision and goals, as well as its preferred focus areas and strategies. In addition, the report presents case studies for selected strategies of interest to the community, as well as planning tools for identifying and implementing strategies.

In Fall 2009 the City applied for grant funding for the EE&CS, and a letter of Commitment was signed by the Mayor on September 30, 2009. The EE&CS was vetted in public meetings, including the Utility Advisory Committee (UAC) and City Council study sessions and meetings, and is intended to be approved by the City Council by early 2012. EE&CS Development was funded through the American Recovery and Reinvestment Act by the US Department of Energy and administered through the Energy Policy Division of the Washington State Department of Commerce under the Energy Efficiency and Conservation Block Grant No. DE-EE0000849.

II. Foundation

In late 2009, the City Council recognized and prioritized a need for a comprehensive Land Development Code Update (LDCU). The Land Development Code was outdated as it had not been updated to implement the City's 2007 Comprehensive Plan. In addition it was not reflective of current best practices, was scattered throughout the larger City code and therefore difficult to reference, and contained inconsistent, conflicting, and confusing amendments that had been made over the years. Concurrently, City Staff recognized that the land development patterns and policies can significantly impact a community's ability to pursue energy efficiency and the use of renewable energy sources. In addition, the City's non-motorized planning process was well underway and could provide and receive guidance from an energy planning process.

As the owner of its own electric, gas, water, and sewer utilities, the City has long been a proponent of energy efficiency and conservation. Its Energy Services Department has been a leader in investing conservation funds available from the Bonneville Power Administration (BPA), and won national attention when it created the first municipal solar park, Ellensburg Community Renewable Park in Rotary Park, in 2006. In recent years, the City and Economic Development planners have become concerned about the possibility that new development in the City will be constrained due to rising costs of electricity. BPA's Tier 2 (higher) power pricing for electricity would be triggered if the City's combined electricity needs (including the new development) exceeds BPA's generation capacity tied to Tier 1 (existing) power pricing. Finally, a planning process for a wind ordinance was in progress and could provide and receive guidance from the energy planning process.

Creating a written, community supported EE&CS that builds on this foundation, and provides an infrastructure for measuring continued progress was considered a natural and timely next step. By combining efforts and aligning the LDCU process with EE&CS development, the City could more effectively leverage staff involvement as well as funding resources available. City Staff successfully sought external sources for the EE&CS that was available through the American Recovery and Reinvestment Act (ARRA). \$135,000 in funding was awarded by the US Department of Energy through the Energy Policy Division of the Washington State Department of Commerce under the Energy Efficiency and Conservation Block Grant (EECBG) Program.

III. EE&CS Development Process

The EE&CS development approach entailed building on existing initiatives, identifying code barriers to implementing energy efficiency & conservation strategies while recommending solutions, and identifying additional strategies that make sense given community interest, available resources, and potential impact. As part of the process, it became clear that City Council and Staff were interested in a strategic document that provided background and an infrastructure for future decision-making, rather than a set of recommended strategies to be adopted and implemented. As such the document is considered a "living document" providing flexibility to the City as it moves forward.

Roles

City Council

The City Council had approval authority with regard to the EE&CS document. It participated in public study sessions with the Utility Advisory Committee (UAC) and Council meetings to provide review and direction. Members participated in community workshops and were provided data revealing community preferences as part of their decision-making process.

Utility Advisory Committee

The UAC operates under the authority of Chapter 1.50 of the City Code and was created for the purpose of providing a mechanism for the City Council to obtain benefits of recommendations, advice, and opinions on those matters affecting City energy policy. As such, the UAC had review authority with regard to the EE&CS document. It participated in public study sessions with the Council to provide review and direction. In addition, the UAC held its own planning sessions with the EE&CS consultant, participated in stakeholder interview sessions, conducted research on relevant topics, and participated in community workshops. All data and communications with the City Council were available to the UAC as well. UAC members were interviewed by the consultant as part of the EE&CS research process.

City Staff

The Energy Services Department (ESD) was a major participant in development of the EE&CS and had a significant role in shaping the EE&CS as it will be the Department implementing it. ESD provided historical data as well as information about current initiatives. In addition, the City's Community and Development Department staff provided relevant data on both the LDC and building code. City Staff were interviewed by the consultant as part of the EE&CS research process.

Community

Key stakeholders were interviewed by the consultant as part of the EE&CS research process. In addition to City Staff, stakeholders interviewed included representatives from the local development and building community, the business community, environmental/energy activists, Kittitas County and Puget Sound Energy. In addition, a public survey was conducted that was available online and at public venues. Also, two community workshops were conducted to both inform citizens about EE&CS development and gather input. Highlights of the public involvement process are described later in this section.

Consultant

The consultant team for the EE&CS included O'Brien & Company, Makers Architecture, and Cascadia Green Building Council (CGBC). O'Brien & Company, a sustainability consultant since 1991, provided contract and project management, alignment with the LDCU effort, lead the development process described in this report

and produced this document. CGBC was responsible for performing research and providing recommendations relevant to codes and policies, and Makers provided insight on LDCU efforts that cross over with the EE&CS work. The team also included Transpo and Watershed for specific questions in those areas.

Research Approach and Inputs

Development of an effective EE&CS raised a number of questions including:

- Are there models that Ellensburg can draw from to develop the EE&CS and implementation strategies?
- How much energy is being consumed and generated by the City and its citizens today, and how does that compare to national or regional benchmarks?
- What efforts to improve energy efficiency and increase the use of renewables are already in place and what have they accomplished?
- What code barriers to achieving energy efficiency improvements exist and how can they be remedied or mitigated?
- What additional strategies would build on existing efforts to address the community's priorities and achieve the community's energy efficiency and conservation goals?

Methodology

The consultant team used a variety of methods to respond to these questions, including:

- Internet research to compile information about other communities preparing EE&CS, which included accessing completed or draft EE&CS when available as well as community characteristics to determine transferability to Ellensburg (EE&CS varied widely depending on community goals and character). This information was provided to the City Council and UAC by the consultant in Power Point presentations at public meetings to help shape an EE&CS appropriate for Ellensburg. These presentations are available on the City's website.
- Internet and phone research to compile case studies for strategies of interest identified by City Staff, Officials, and citizens. These case studies, along with resources for further exploration by City Staff and the UAC are included in this report.
- Energy consumption and generation data were compiled by the City's Energy Services Department, analyzed by the consultant, and are included as the basis of a benchmark for the City as it implements the strategy. In addition, the consultant researched similar data to determine how the City is performing compared to national and regional averages. This information is provided in this report.
- City staff were interviewed by the consultant to identify efforts and policies intended to promote energy efficiency and the use of renewables. A summary of those contacted is included in this report as Appendix 4.
- To identify code/policy barriers to energy efficiency and conservation and possible remedies, the consultant interviewed City staff and key stakeholders (described above). In addition City Staff and the consultants reviewed the Land Use Code and relevant building codes adopted by the City (including State building and energy codes) for barriers and opportunities, as well as draft policies (such as the proposed wind ordinance and non-motorized element). The consultant also drew on code barrier research compiled by the Cascadia Green Building Council's report, "Code and Regulatory Barriers to the Living Building Challenge for Sustainable, Affordable Residential Development." A summary of results from this gap analysis is included in this report as Appendix 6.
- Community input through a survey and at community meetings identified preferred strategies. A summary of those community supported strategies is included in this report for each of the prioritized focus areas.

Highlights of Public Participation

Community Survey

Each City that embarks down the path of an EE&CS will have different priorities, challenges, needs, and ideas about how the strategy will be a good fit for the personality and demographic of that City. One of the first steps in the public participation process was to reach out to greater City of Ellensburg and Kittitas County residents to identify community preferences and priorities to include in the EE&CS. Over 500 respondents completed the survey, which included seven questions that targeted participant satisfaction with the current municipal efforts, identified their own individual current energy related practices, and solicited feedback on preferred future City-driven energy efficiency actions. Figure 2 provides a compilation of key topics that 331 respondents referenced as responses to what an energy efficient community means to them (not all survey respondents answered every question).

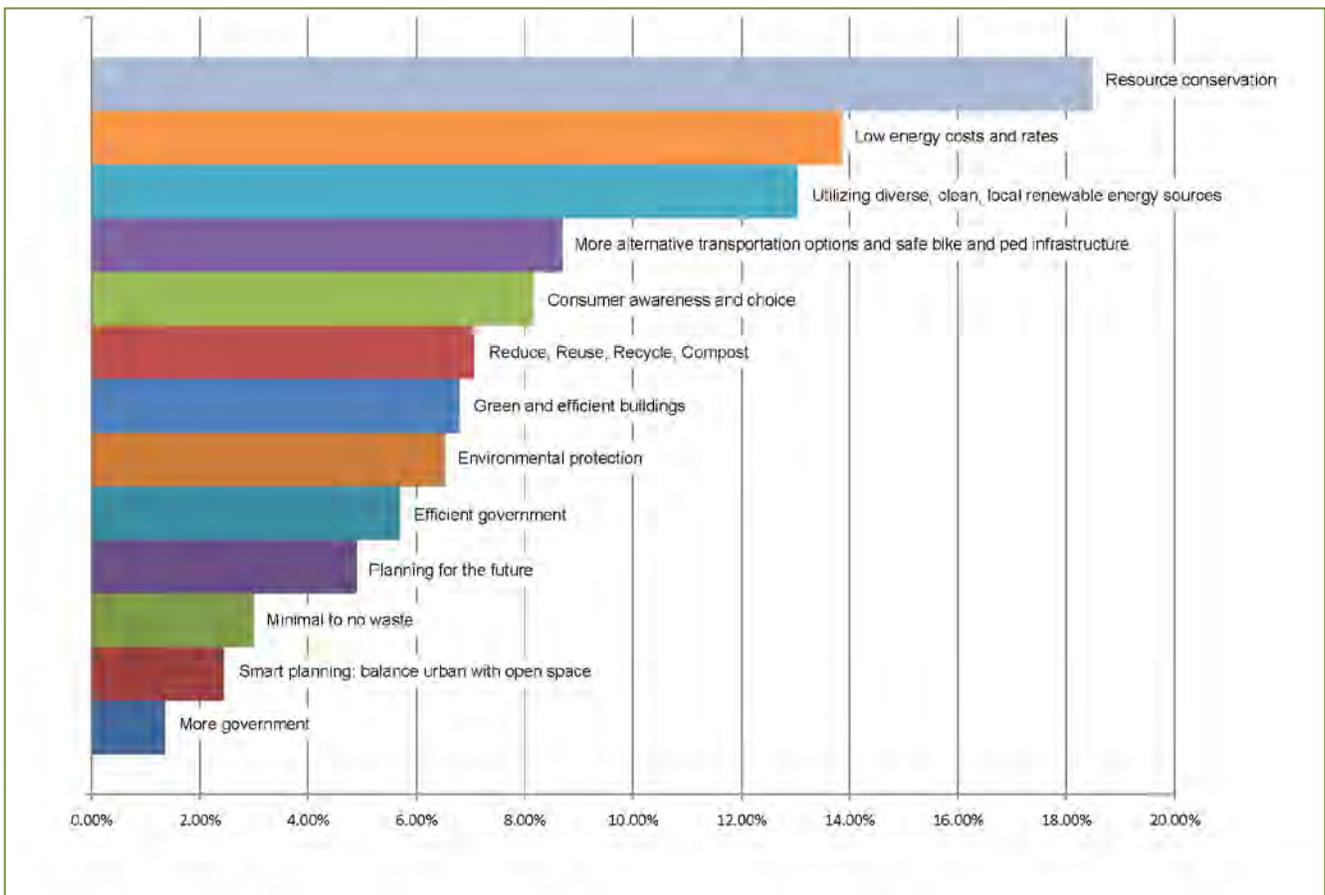


Figure 2. Community responses to "What Does an Energy-Efficient Community Mean?"

Several overarching EE&CS approaches and implementation themes emerged during this first outreach effort, including:

Maintain what's Right

- Keep the small town, rural character
- Celebrate and preserve the area's natural resources

Increase and Improve where Needed

- Create a more vibrant, thriving downtown core
- Increase the breadth of actions – bring diversity to energy conservation and renewable strategies

Inspire, but Validate

- Focus on voluntary and incentivized actions instead of mandatory ones
- Showcase the financial bottom line of selected strategies

More specific areas of interest pertaining to energy conservation and renewable energy strategies included the prioritization of solar and wind power generation as the most important energy-related action or project that the City should consider, with solar as the top priority. Retrofitting existing buildings, having more access to waste reduction opportunities and better alternative transportation were the next most popular responses of priority actions.

A full summary of the survey findings is available in Appendix 1.

Community Interviews

A variety of citizens, groups/organizations and businesses were identified by the Community Development staff and consultant team to provide early insights on the LDCU and EE&CS. 24 in-person interviews were conducted with property owners and developers, green building professionals, realtors, historic preservation advocates, Central Washington University staff, economic and business development groups, and county and city staff.

Community Meetings

The City held two community meetings with opportunities to learn about and provide feedback on the development of the EE&CS.

Workshop 1

The first public workshop, held on January 31, 2011, had a joint focus on introducing the EE&CS and providing detailed information on the Land Development Code Update (LDCU). An EE&CS project information station provided general project information and an outline of preliminary Focus Areas, compiled through the early meetings with the City Council, the City’s Utility Advisory Committee, Stakeholder Interviews and the Community Survey. As an outcome of the workshop, seven focus areas were refined to serve as the framework for implementation recommendations moving forward, including: transportation; economic development; green buildings and infrastructure; existing buildings; renewable energy; energy access and equity; and energy efficient development and smart growth. A full summary of the first public workshop is available as Appendix 2.



IV. Existing Conditions

Regulatory Environment

National

At the federal level, the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007 establish national legislation around energy sources, financing and consumption. The 2007 legislation revised standards for equipment and lighting, outlined new initiatives for building energy conservation, and requires increased vehicle fuel efficiency.

Efficiency of buildings is regulated by energy codes which establish minimum requirements for how a building's envelope, mechanical systems, and lighting must be designed and installed. While the US Department of Energy (DOE) provides guidance for energy code adoption and implementation, energy codes are established and enforced by state and local jurisdictions. Energy codes are largely based on the International Energy Conservation Code (IECC) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers 90.1 standard (ASHRAE 90.1) which are updated every few years to include more stringent requirements for energy efficiency.

The 2012 update of the IECC is expected to take a large leap toward energy reduction. In October 2010, code officials approved a package of revisions targeted to provide an additional 30% in energy savings over commercial structures built to ASHRAE 90.1-2004 standards. Specific upgrades include improvements to cooling and daylighting requirements, renewable energy standards, and the addition of a new section that requires testing and verification. IECC 2012 will also serve as the baseline standard for the International Green Construction Code (IgCC)—a new national model green code currently under development by the International Code Council.

Washington State

Over the past 5 years, Washington has adopted a set of coordinated statewide policies to reduce energy use and associated greenhouse gas emissions, establishing targets for emission reductions at or below 1990 levels by 2020 (as per RCW 70.235.020). These policies are intended to help the state meet its statutory greenhouse gas reduction targets, and include reducing emissions from the transportation and building sectors, establishing tax credits for renewable energy, and creating green jobs. The State's Evergreen Jobs Initiative sets a target of 25,000 green jobs by 2020 (including 8,400 green jobs the State measured in 2004).¹

The Washington State Energy Code (WSEC) is one of the most stringent energy codes in the country. WSEC is a mandatory, statewide code regulating all residential and commercial buildings. It is reviewed and updated on a 3-year cycle to integrate new technologies and incrementally move towards more stringent energy efficiency standards; the most recent 2009 update went into effect in January 2011.

In 2009, Washington also passed the important Efficiency First legislation (SB5854) affecting energy use in new and existing buildings around the state. The policies mandate that new construction permitted under the 2031 edition of the state's building code is 70% more efficient than current standards (relative to the 2006 WSEC), becoming the first state to legislatively adopt the Architecture 2030 Challenge into its building code. The non-

¹ More information on Washington State energy and climate initiatives are available on the Department of Ecology's Climate Policy Framework website: <http://www.ecy.wa.gov/climatechange/laws.htm>

profit organization Architecture 2030² issued a nation-wide Challenge in 2007. It encourages architects, builders, city building officials, and all others who influence the built environment to track a path towards zero GHG emissions from new buildings by 2030. Even though Washington has adopted the challenge into its building code, the current gap between the existing 2009 code and energy efficiency goals of the Architecture 2030 Challenge is not insignificant. According to Architecture 2030 report, the commercial code is roughly 25% below and residential code is roughly 30% below what would currently (2010) meet the Challenge.³

An inherent challenge of the current regulatory framework around building energy use is the fact that current codes only address envelope design, mechanical equipment and lighting. Lack of code enforcement, absence of commissioning requirements and lack of accountability for unregulated plug loads such as computers, kitchen appliances, fans and televisions (which can range from 25% up to 70% of a building's total energy use⁴) can drive high energy consumption even with the most stringent codes.

In response, mandatory performance benchmarking and disclosure regulations are an emerging trend. Jurisdictions around the country are beginning to require building owners to disclose energy consumption of their buildings as an important step in measuring and tracking building energy use and the effectiveness of efficiency measures. Both Washington and California now have statewide disclosure requirements, and cities such as Washington DC, Austin, New York and Seattle require energy disclosure. Washington State's Efficiency First legislation, passed in 2009, requires owners of nonresidential buildings to rate buildings using the Energy Star Portfolio Manager and to disclose energy performance information to prospective buyers prior to the closing of a transaction. Non-residential buildings over 50,000-sf are required to disclose energy use starting January 2011, while requirements for buildings greater than 10,000-sf go into effect in January 2012.

Energy Consumption

Starting with a current understanding of national, regional and local energy consumption trends helps to build a baseline from which the City can assess progress over time.

National Energy Consumption

Buildings in the US consume large amounts of energy to heat, cool and power electrical equipment over the course of their life span, accounting for approximately 41% of the nation's total primary energy consumption. In addition, they account for 72% of electricity consumption, 38% of CO₂ emissions, and 13% of potable water use.⁵ Figure 3 illustrates national energy use by sector and identifies energy use categories within residential and commercial buildings.

Building related energy use is also increasing despite growing awareness around environmental impacts and increasingly stringent efficiency standards. According to the US DOE, 2008 total building energy consumption was roughly 50% higher than it was in 1980. Residential buildings represent the largest portion of the US building stock and are responsible for the largest portion of total energy consumed by buildings. Generally speaking, residential energy use is dominated by heating loads while electric lighting loads dominate commercial building energy use, though a number of factors influence actual energy use including building type, occupant behavior and regional climate.

² www.architecture2030.org

³ Rough estimate based on the report "Meeting the 2030 Challenge through Building Codes."

http://www.architecture2030.org/files/2030Challenge_Codes_WP.pdf, with updated estimates based on the 2009 Code.

⁴ New Buildings Institute, Summary Paper on Plug Loads, 2010.

⁵ U.S. Energy Information Administration and U.S. Green Building Council, 2009 Green Building Facts.

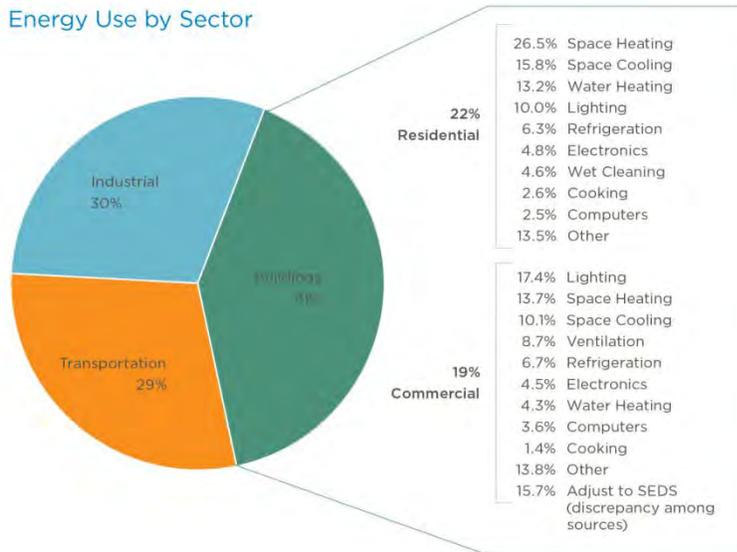


Figure 3. National Energy Use by Sector.

National Energy Use By Sector and by End Use Profile for Buildings. Source: US DOE

Next to buildings, the industrial sector accounts for the largest amount of US energy consumption. Energy is used by the industrial sector for a wide range of activities including processing, space conditioning and lighting. In the US, the largest industrial energy uses are for petroleum refining and the manufacturing of steel, aluminum, paper, cement and other chemicals.

The transportation sector is responsible for an estimated 28% of total US energy consumption⁶. This sector consumes energy for moving people and goods/products by road, rail, air, water, and pipeline. In the US and globally, road energy use by cars and light trucks consumes the largest portion of energy by this sector. Because of this, transportation energy demand is closely linked to economic growth and population.

US Fuel Mix

Electricity generated in the US is derived from a number of fuel sources (illustrated in Figure 4), approximately 70% of which are currently fossil fuels such as coal, natural gas and oil. Over the last 20 years, the US has increased electricity demand by 78%. To meet the growing demand, natural gas generation has doubled and coal generated electricity has increased by roughly 25% while nuclear power generation has remained relatively constant. Figure 5 illustrates that fuel projections into 2035 show a growth of renewable energy sources, mostly due to an increase in wind power.

⁶ U.S. Department of Energy.

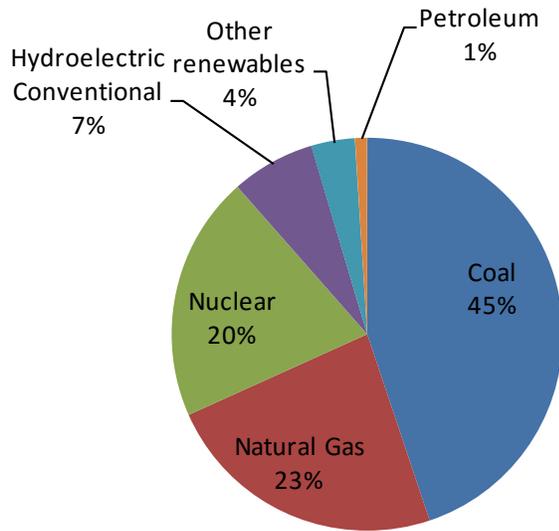


Figure 4. 2009 US Electricity Generation by Source.

Source: US Energy Information Administration.

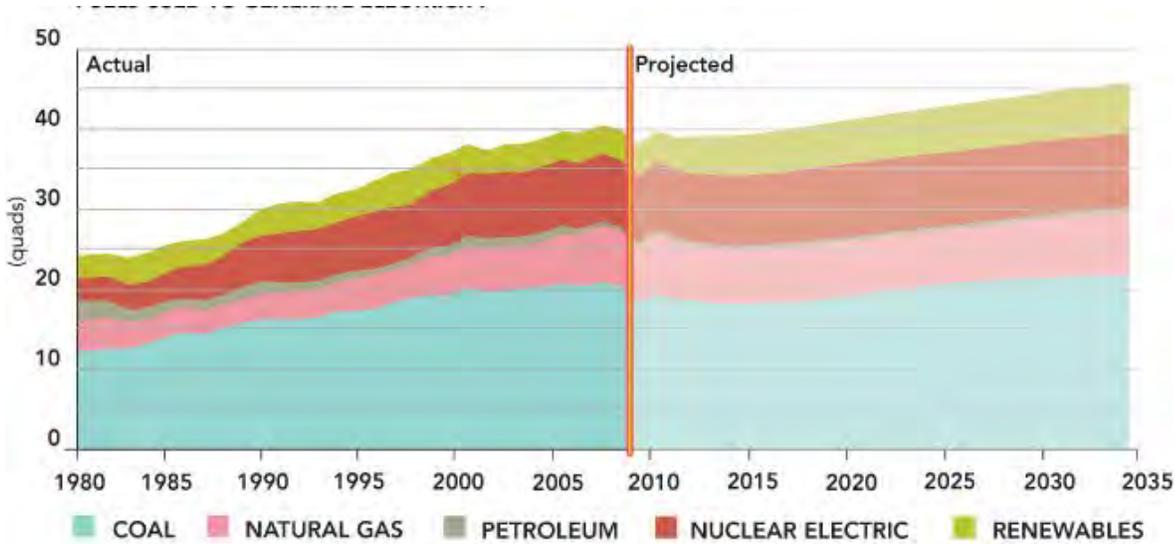


Figure 5. Fuels Used to Generate Electricity Including Projections to 2035.

Source: US DOE Buildings Energy Data Book, Chapter 6: Energy Supply

The next section discusses in more detail the breakdown of energy consumption by fuel type in Ellensburg, with some rough comparisons, where possible, against average US energy consumption for residential, commercial and industrial sectors.

Ellensburg’s Combined Community Energy Consumption Baseline

In order to appropriately plan and implement conservations programs, a baseline assessment is necessary for tracking progress and identifying the distribution and types of energy consumption in Ellensburg. In Ellensburg, electricity and natural gas are the primary sources of energy.

Table 1 provides the electricity and natural gas consumption by sector for Ellensburg buildings in 2009, in MBTU.

Table 1. Ellensburg 2009 Electricity and Natural Gas Consumption, MBTU.

Sector	2009 Electricity Consumption MBTU	2009 Natural Gas Consumption MBTU
Residential	262,734	254,163
Commercial	398,109	519,645
Industrial	45,714	551,544

A baseline is a static ‘snapshot’ in time, useful for highlighting details of the energy used in a given sector of the community, at a given point in time. This baseline can then be used to measure future progress. Providing regional and national data provides a useful perspective. But in order to accurately track the success of City programs and policies over time, Ellensburg will need to compare itself against itself, measuring progress towards established targets.

Establishing these targets (or interim goals) is an aspect of implementing the EE&CS Strategy, and includes determining which metrics to use. Identifying useful metrics requires knowing what community data is available; fortunately, having a municipally owned utility means that the City has more than 20 years of historical community data to use for analysis. Implementation of the Strategy would therefore include providing resources to City Staff to compile and analyze historical data. Understanding that this historical analysis is critical to having an accurate measurement of progress in Ellensburg, this Strategy provides information about Ellensburg at this point in time, and provides regional and national data for context only.

On an electricity-only basis, 2009 residential electricity use in Ellensburg was 10,128 kWh per household. The 2001 annual electricity use per household in the US was 10,656 kWh (latest year of available data).⁸ The average natural gas use in Ellensburg in 2009 was 612 CCF per household, compared to the national average of 515 CCF per household in the same year.⁹ Since commercial and industrial energy use varies greatly depending on building type, discussion of these sectors is provided in the Energy Use Intensity subsection below.

Understanding Units of Energy

Electricity consumption is measured in kilowatt-hours (kWh), or 1000 watt-hours. For perspective, a 1000-watt coffee maker running for one hour will consume 1 kWh and will cost approximately \$0.06. Natural gas is measured as volume and expressed in cubic feet (CF). Prefixes are often used with energy to indicate larger magnitudes of measurement, for example CCF = 100 cubic feet (also equal to 1 “therm”). In Ellensburg, the usage cost of natural gas (not including daily charges, delivery cost, and fees) is approximately \$0.90 - \$1.25 per CCF. For perspective, a medium efficiency furnace⁷ consumes approximately 1 CCF of natural gas over the course of an hour and costs approximately \$1.00 in Ellensburg. In order to relate various types of energy consumption, units are often converted to a common unit of heat known as British Thermal Units, or BTUs. Larger magnitudes are reported as KBTU = 1000 BTU or MBTU = 1,000,000 BTU. 1 kWh is approximately equal to 3.412 KBTU and 1 CCF of natural gas is approximately equal to 103 KBTU.

⁷ For this example, assume a furnace rated at 80,000 BTUH and 80% efficiency.

⁸ 2001 Residential Electricity Consumption. http://www.eia.gov/emeu/repse/enduse/er01_us_tab1.html

⁹ Table 1. U.S. Census Region/Division Average Consumption per Household. Energy Information Administration, Office of Oil and Gas, June 2010.

ftp://ftp.eia.doe.gov/pub/oil_gas/natural_gas/feature_articles/2010/ngtrendsresidcon/ngtrendsresidcon.pdf

It is useful to look at the distribution of sector use to monitor changes over time and when considering conservation programs. A breakdown of relative electricity-only consumption by sector is presented in Figure 6.

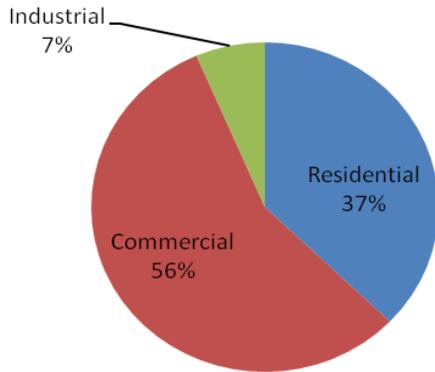


Figure 6. Ellensburg Electricity Consumption by Sector 2009.

As shown above, commercial buildings consume over half of all the electricity use in the city, residential customers consume more than one third of the electricity, and industrial uses represent only 7% of electricity consumption. The 2009 natural gas consumption by sector is presented in Figure 7 below.

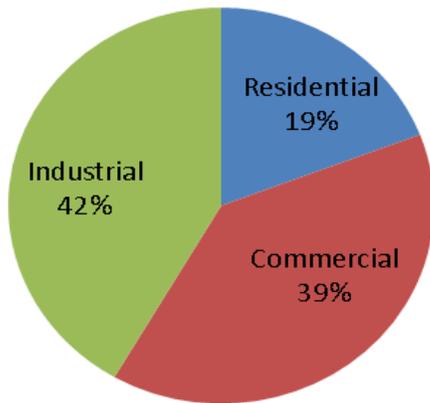


Figure 7. Ellensburg Natural Gas Consumption by Sector for 2009.

Contrary to electricity use, commercial and industrial customers consume approximately the same amount of natural gas, while the residential sector makes up only 19% of natural gas use.

Energy Use Intensity

Energy Use Intensity (EUI) identifies the amount of energy used per a common denominator (usually per household for residential or per square foot for multifamily and commercial) and is a useful tool to compare consumption rates over time, between different users, or across regions.

According to the Energy Information Administration's (EIA) Residential Energy Consumption Survey (RECS) the average home in the Pacific Region in 2005¹⁰ (the most recent available data) used 71.8 MBTU of total

¹⁰ Table U.S.14. Average Consumption by Energy End Uses, 2005. "Residential Energy Consumption Survey – Detailed Tables." U.S. Energy Information Administration.

http://www.eia.gov/emeu/recs/recs2005/hc2005_tables/detailed_tables2005.html

household energy. Based on combined electricity and natural gas consumption information provided by Ellensburg, the average household in Ellensburg used 68.0M BTU of energy in 2009.

For commercial and industrial buildings, it is useful to compare energy use on a per square foot basis with other buildings of similar use. For example, the average office building in the Pacific Region, according to EIA's 2003 Commercial Buildings Energy Consumption Survey¹¹(CBECS), used 65.1 KBTU/sf. At the time of this report, the square footage of Ellensburg commercial buildings was not available, but the total energy use in 2009 in commercial buildings (including buildings other than offices) was 917,753,000 KBTU. A recommended step in the implementation of the EEC&S is to verify the total square feet of commercial buildings in order to create a useful baseline for measuring progress.

Central Washington University and Twin City Foods comprise the "Industrial" category of energy customers, and the 2009 EUI is approximately 176 KBTU/sf. Since the baseline EUI of an education facility and a food processing facility vary greatly, it is less useful to compare the overall Industrial EUI data in aggregate to regional or national averages. In these cases, individual building or customer EUIs should be calculated and compared against subsequent annual data for the same building/customer or to CBECS data for a similar building type.

Transportation

Specific data for the energy consumed for community transportation purposes in Ellensburg is not available, since neither the County nor the State track road use and traffic data at the local level. However, some baseline estimates on transportation costs may be useful as a reference. The Housing + Transportation Affordability Index is one of the most widely used and well-regarded transportation cost frameworks in the US. It uses a model that looks at regional averages for household variables (such as household size and commuters per household), neighborhood variables (such as residential density, average journey to work time, transit connectivity index), and auto ownership, auto use and transit use.

This model shows the typical household in Ellensburg spending \$788 on transportation costs per month (\$9456 per year) – equivalent to 0.58 metric tons of CO₂, or 1.3 barrels of oil.¹² This local transportation average is slightly higher than the 2010 national average of \$7677 calculated by the Bureau of Labor Statistics.¹³ As above, the regional and national data is provided for context. As part of implementing this EE&CS, the City of Ellensburg could establish methods of tracking local transportation data. Understandably a tracking program for the City would require creative use of community resources. However, it would allow the City to identify the extent of the financial savings for Ellensburg residents, which are potentially significant.

Municipal Facility Energy Consumption Baseline

2010 energy consumption data were gathered for all of Ellensburg's municipal facilities. Some facilities have both gas and electric service, while others only have one or the other. Consumption data were gathered in CCF (for natural gas) and kWh (for electricity) and both were converted to MBTU for consistency.

¹¹ Table C9. Consumption and Gross Energy Intensity by Census Division for Sum of Major Fuels: Part 3. "Commercial Buildings Energy Consumption Survey," 2003. U.S. Energy Information Administration.

http://www.eia.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/detailed_tables_2003.html

¹² Calculated using Abogo.com for the City of Ellensburg.

¹³ Bureau of Labor Statistics Consumer Expenditures – 2010, released 2011;

<http://www.bls.gov/news.release/cesan.nr0.htm>

For all 21 municipal facilities, the total 2010 energy consumption was 24,446,702 KBTU, or 7,165,622 kWh. It is worth noting that over 65% of the total municipal energy use is consumed by just two facilities. Figure 8 illustrates the relative consumption of combined energy use (gas and electricity) of the two biggest users (the Waste Water Treatment Plant (WWTP) and the Pool) compared to all other municipal users combined.

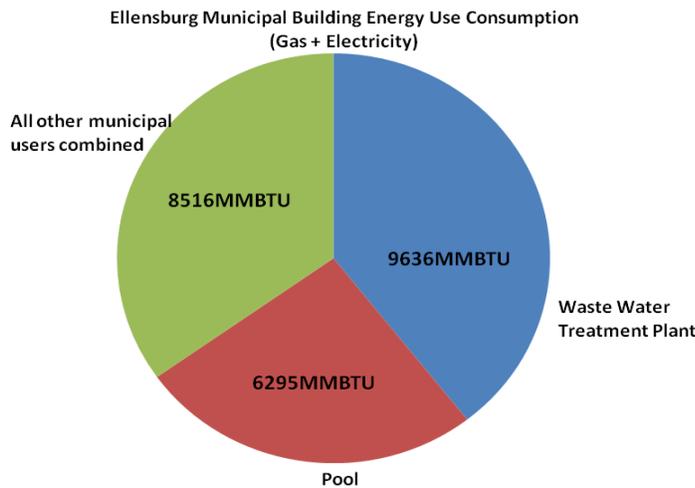


Figure 8. Energy use of WWTP, Pool, and all other municipal users of gas and electricity.

The relationship between the embodied energy in water (energy required to pump and treat water) and the embodied water in energy (the water that is consumed, altered, or evaporated during the production of energy at fossil-fuel energy plants and at hydroelectric dams) is referred to as **watergy**. Therefore, it is also useful to look at the largest water consumers in the community when designing an EE&CS. The pool, Hal Holmes Community Center, and the Main Warehouse, though at a magnitude less than the WWTP, are responsible for 40% of the non-WWTP municipal facility water use in the City. Since the WWTP uses water and energy in proportion to the amount of wastewater that is sent to the plant, and is the single largest user of electricity and water among the municipal facilities, conservation efforts should simultaneously look at both energy users and significant water users within the city. This fundamental concept of **watergy** should be considered for future conservation efforts.

Raw data on energy consumption provided by the City as well as calculations for aggregating energy consumption data are included in Appendix 5 so future calculations can be consistently compared against the benchmarks in this report.

GHG Emissions

Fossil fuel use is associated with the greenhouse gas (GHG) emissions that contribute to global climate change. Ellensburg's small size and low-emissions hydropower electricity mean that its utility's proportional contribution to this global issue is small. Therefore, reducing GHG is not elevated to a Goal in this Strategy. However, the City supports local initiatives and individual actions to address these emissions. Central Washington University, a major consumer of the City's electricity, is a signatory of the American College and University Presidents Climate Commitment, and has a bold goal of carbon net zero by 2030. The City has assisted in CWU's efforts; the City's Energy Services Director is a member of the External Advisory Committee to CWU's Carbon Reduction Task Force. In addition, the City currently offers a carbon calculator on its website for individuals to determine their contributions to GHG emissions due to home, transportation, solid waste, air travel, water, and utilities. Encouraging the community to take individual action is significant, since the greatest proportion of GHG emissions in Washington State come from transportation (46%), compared to

electricity (20%), industrial sources (16%), residential and commercial buildings (9%), agriculture (6%) and waste (3%).

The Northwest Power Planning Council, in Chapter 11 of its Sixth Northwest Power Plan, notes that the specter of climate change can affect power planning in two ways: by altering electricity demand and changing precipitation patterns, river flows, and hydroelectric generation; and by influencing future resource choices. Although Washington State electricity production produces far fewer emissions than most other regions of the US (due to its reliance on hydropower), there is significant opportunity in increasing efficiencies in buildings (and vehicles). In addition, the plan cites the opportunity presented by renewable energy production.

Energy Production (Renewables)

Ellensburg's average of over 300 days of sun per year and geography lends itself well to both solar and wind energy production, and the City has already invested in infrastructure to support these renewable energy sources.

As of early 2010, the State of Washington had 5.2 MW of cumulative installed solar capacity.¹⁴ By comparison, in 2009 California, which has the most cumulative installed solar capacity, had 768 MW and Massachusetts, the 10th highest state, had 18 MW. According to Sierra Club's 2005 Sustainable Cities Report¹⁵, Austin, TX has set a goal to install 100 MW of solar facilities by 2020.

Ellensburg Community Renewable Park

The Ellensburg Community Renewable Park is owned and operated by the City, with strong financial support from local homeowners and businesses. It is believed to be the first such park established in the United States.

In November 2006, with strong financial support by local homeowners and businesses (including Central Washington University), the City of Ellensburg completed the first phase of a 36 kilowatt pilot community solar electric project. The pilot project offers everyone in the City an opportunity to invest in the locally produced electricity, generated through 120 polycrystalline solar modules in the park and funneled directly to the City's utility power lines.

Phase II, an additional 72 polycrystalline solar modules, was completed in 2008 with financial assistance from a grant received by CWU. Phase III, 180 thin film solar modules, was completed the same year. The City is currently in Phase IV, which is using Federal ARRA grant funds with innovative financing options for community contributions. In 2009 this project was selected to be part of the Pacific Northwest Smart Grid Demonstration Project. As part of the demonstration project, DOE awarded the City a matching grant of up to ¾ million dollars to help finance the thin film solar modules, solar concentrating dishes and wind turbines.

To date, nearly 200 300-watt RW Schott Polycrystalline Solar Modules and over 700 75-watt First Solar Thin Film Solar Modules have been installed and are operating at the park. Through 2011, several additional 3-kw Infinia Solar Concentrating Dishes, as well as several 2.4 to 30-kw Wind Turbines, were installed as part of Phase IV, blending different renewable energy technologies. Additional generating capacity is expected to be provided.

¹⁴ Sherwood, Larry. U.S. Solar Market Trends 2009. Interstate Renewable Energy Council, July 2010.
http://irecusa.org/wp-content/uploads/2010/07/IREC-Solar-Market-Trends-Report-2010_7-27-10_web1.pdf

¹⁵ Regelson, Ken. Sustainable Cities: Best Practices for Renewable Energy and Energy Efficiency – Austin, Chicago, Fort Collins, Portland. 2005. <http://rnc.sierraclub.org/energy/library/sustainablecities.pdf>

Evergreen State Solar Partnership

The City of Ellensburg has been selected by the Washington State Energy Office to participate in the [Evergreen State Solar Partnership](#) that is tasked with facilitating the adoption of solar energy technologies across all utility types and jurisdictions. The Partnership is funded by the Department of Energy and the objective of the Partnership is to bring down costs for solar at the residential and small commercial scale. Focus will be on improving the permitting and interconnection processes by establishing a standardized and streamlined permit process; improving net metering and interconnection standards; identifying financing options; and removing siting restrictions or incorporating favorable provisions in local planning and zoning regulations. The partnership is one that promotes cross-jurisdiction collaboration while building on the efforts already underway with the EE&CS and the LDCU. Specific opportunities and challenges relevant to this Partnership initiative are discussed in the Code Barriers to Energy Efficiency and Renewables section of the strategy.

Residential Solar PV Projects

Solar panels installed on private residences are net metered and may qualify for state solar production incentives, depending on where the panel was manufactured. To date, according to City research only two residential homes in Ellensburg have installed net metered PV systems, signaling a significant opportunity for residential energy generation.

Residential Solar Hot Water

Another noticeable gap is the lack of residential solar hot water installations in the City – to date the City does not have any record of solar hot water installations. This gap also matches up with feedback gathered at the second community meeting, where participants called for more information and resources for solar hot water.

Code Barriers to Energy Efficiency and Renewables

Code Barriers

Building and land use codes can inadvertently present barriers to implementing energy efficiency and renewable energy strategies community-wide. Obstacles can exist in the content of land use and development codes, design standards, building and energy codes, as well as in the regulatory process itself. Gaps or conflicts within the codes themselves present technical hurdles, while simply navigating the regulatory system for approvals can be a difficult task for new energy projects particularly if they are the first of their kind.

Common land development code obstacles include provisions that restrict or prohibit onsite renewable energy systems. Height restrictions and setbacks may limit the feasibility of building-mounted systems such as PV or small wind turbines. In addition, strict provisions around building orientation and eave overhangs can deter passive solar design strategies. Updating codes to allow for greater flexibility during site planning to address solar orientation and instituting solar access regulations can result in measurable energy efficiency advancements for new developments.

Zoning codes can present barriers to reducing a community's transportation-related energy use. Local urban form plays a significant role in the amount of automobile-related energy use and associated carbon emissions. Transportation energy savings can result from updating codes to promote infill and mixed-use development, reducing minimum lot sizes and increasing densities or permitted Floor Area Ratios (FARs). These code changes support Smart Growth principles adopted by many communities, including greater connectivity and walkability.

Barriers can also exist in building codes where the code is "silent" such as the case with non-conventional green building construction approaches like strawbale. In absence of defined standards, building officials may require extensive (and expensive) testing to permit such strategies, require redundancies that make them economically infeasible or prohibit them all together.

Even energy codes, which establish minimum energy performance, often fail to incentivize higher performance and more efficient buildings. For example, structural and ventilation requirements may unintentionally conflict with advanced energy efficient measures such as super insulation. Lack of energy code enforcement or performance-testing requirements has resulted in many buildings falling short of meeting even minimum energy code standards.

A comprehensive approach to removing regulatory barriers involves not only updating existing codes and standards but also developing new ones to address emerging technologies and approaches to energy efficiency and renewables. Flexibility within the codes to allow for demonstration projects to test innovative strategies is essential to provide information to policy makers that can be incorporated into future code updates. In addition to supporting existing code, the City may want to investigate possible benefits of adopting even more stringent codes.

Ellensburg's Approach

The City of Ellensburg has taken a unique approach to identifying and removing regulatory barriers by aligning the EE&CS with their land development code update process. This approach maximizes opportunities to support implementation of efficiency and conservation measures that would otherwise be hindered by their codes or regulatory processes.

Gap Analysis: Barriers and Opportunities in Existing Code

As part of the LDCU and EE&CS, a gap analysis of current codes and policies was conducted to determine what stands in the way of energy efficiency goals, and what needs to be either updated, added or eliminated. During the gap analysis process, it was determined that the City has a number of policies and regulations already in place that support green building in general, and energy efficiency and conservation specifically. Current comprehensive plan policies promote energy efficiency and alternative energy sources including the use of solar and other renewable technologies within the community. In addition, the Planned Unit Development (PUD) section of the land development code outlines density bonuses for energy efficiency and environmental design practices. However, it was determined that no projects had ever used the density incentives due to challenges and restrictions of permitting through the PUD process. This issue is being addressed as part of the LDCU.

The gap analysis highlighted a number of opportunities for Ellensburg to remove barriers and provide more direct support for energy efficiency and conservation. The full gap analysis, which highlights over 30 code elements with energy impacts, can be found in the Appendix 6.

Table 2 outlines key opportunities for EE&C.

Table 2. Key gap analysis opportunities for energy efficiency and conservation.

Updating zoning to encourage mixed use and infill development
Adding provisions that enhance vehicular and non-motorized connectivity
Updating development standards to encourage energy efficiency through: <ul style="list-style-type: none">• cottage housing and clustered developments• passive solar orientation

<ul style="list-style-type: none">• solar access
Relocating density incentives in the updated land use code so they are easier to find and use. Tie such incentives to high performance development and design of structures; ie allow greater density for buildings that achieve LEED or Energy Star ratings.
Adding provisions for small scale renewable energy systems: PV and wind
Allowing for demonstration projects to receive greater code flexibility in exchange for higher energy performance

Building Code Opportunities

The analysis of the LDCU and an understanding of the State Building Code and Energy Code (which Ellensburg has adopted) offer some considerations for how building code challenges could be addressed to create a more cooperative and streamlined approach for renewable and other green building strategies. While the City has limited ability to modify building codes, there are definitely some pathways to provide clarification and an easier permitting process without embarking on a cumbersome code amendment process.

Table 3 lists challenges with the current building code and permitting process and articulates corresponding opportunities and recommendations along with examples.

Table 3. Opportunities and recommendations that correspond to current code and permitting challenges.

Challenges with the Building Code & Permitting Process	Opportunities and Recommendations
<p>Barriers of Silence in the Code: Solar strategies, definitions and standards remain largely unaccounted for and undefined in the state code. While there is a fair amount of flexibility in what the code allows, many officials and permitting offices see this flexibility as high risk.</p>	<p>Make Flexibility a Benefit Address the ‘silence’ of certain innovative building strategies (such as solar) in the code by publishing common definitions, recommended parameters, and guidance associated with these strategies.</p> <p><i>Example:</i> Develop Client Assistant Memos (CAMs) which outline best practices. Such CAMs can provide definition for the application itself, as well as address risk factors.</p>
<p>Unnecessary Hoops: In efforts to avoid risk in the permitting process for such undefined strategies, requests are handled with practices that may be overly cumbersome and inconsistent. For example, even the simplest solar installation requires an engineering report; this makes the process unappealing to applicants and puts a damper on solar installation enterprises.</p>	<p>Set the Table for Learning & Support Encourage innovative developers to involve the building official early in the process and provide access to industry research as well as examples of implementations in other jurisdictions. This will make it easier to support the project, and reduce the sometimes adversarial experience that can occur when something new and different is proposed.</p>
<p>Grey Areas: Some structural issues that pertain to solar installation present grey areas, which again can result in a barrier to application. The LDCU analysis addressed overhangs relative to solar access as part of the modifications to setback requirements, but other grey areas remain, and often on a case by case basis - such as structural connections, fire access and wiring.</p>	<p>Involve the Experts Offer 3rd party advisory committees to preview and provide technical analysis and backup to any strategies that fall within the grey areas. Set standards for who can be part of these committees, such as expertise in different strategies, commercial and residential professionals, representatives from the right city or county departments (public health officials, building inspectors, etc.). A code of ethics will avoid challenges with conflicts of interest.</p>

It should be noted that the existing Washington state building and energy code, adopted by Ellensburg, are some of the most stringent standards to support energy efficiency in the nation. The current version of the code offers a prescriptive pathway for achieving more aggressive energy reductions beyond code minimums. The City can play a more proactive role in promoting energy efficiency by encouraging or requiring items from the WSEC Chapter 9.¹⁶ For example, the City could incorporate the suite of pathway options spelled out in Chapter 9 into an incentive program. This would help support the code while encouraging projects to push beyond the minimum requirements.

¹⁶ <http://www.energy.wsu.edu/Documents/BFG%20Chapter%209-Credits-Jan2011.pdf>

Conservation Programs and Results to Date

Ellensburg's investment in resource conservation is not a recent development. Resource management programs have existed since 1980. The Electric Utility has funded over \$6.9 million dollars in residential and commercial resource management programs since 1980. Utility and customer spending on conservation combined has totaled \$16 million over the past 30 years.

Residential Programs to Date

Between 1980 and 1994, the City introduced several residential energy efficiency programs, including:

- Weatherization / Low Income Weatherization
- Water Heater Wrap / High Efficiency Water Heaters
- Low Flow Shower Heads / Appliance Efficiency Upgrades
- Super Good Cents / Long Term Super Good Cents
- Energy Smart Design / Energy Code Compliance

In 1995, the City added to these programs a City Fuel Wise Program and City Residential Fuel Switching Program which lasted through 2000. Between 2007-2009 programs focused on weatherization, Energy Star certification for new homes, refrigerator and freezer recycling and promotion of CFLs.

Residential efforts continuing today include weatherization for electric and natural gas customers, space and water heating upgrades for natural gas customers, and Energy Star New Home Construction for electric and natural gas homes. Resource Management recently developed a program to provide free energy audits and rebates to help upgrade the weatherization and the mechanical systems in 200 natural gas heated homes.

Appliance rebates, refrigerator and freezer recycling and CFL promotion also continue across the board.

Future Residential Conservation Opportunities

The City has identified the following residential conservation opportunities:

Electrically Heated Homes

A total of 4,260 homes in the City are electric-only households and 2,860 use both electricity and natural gas. Of the electric utility customers, a large number of these are student housing.

Of those homes with electricity services, an estimated 500 homes in the City have yet to be weatherized, which primarily includes wall insulation and window upgrades. An estimated 700 homes will benefit from space and water heating upgrades (heat pumps/ductless heat pumps).

Natural Gas Heated Homes

A total of 580 homes, primarily County residents, are only serviced by natural gas, and 2,860 homes are serviced by both electric and natural gas.

An estimated 850 homes have not had floor, attic, walls and window weatherization. 1100 homes would benefit from space and water heating upgrades such as high efficiency furnaces, boilers and water heaters (including furnace duct sealing and insulation).

Resident Engagement in Conservation

The community survey conducted in early 2011 identified common trends for individual conservation efforts. Responses related to conservation efforts at home, work, school, and on the road are displayed in Figure 9.

Most of the 544 respondents indicated that their main energy saving efforts include saving water, reducing material use or recycling, using alternative transportation, and changing out light bulbs. Upgrading appliances and doing building improvements also were mentioned frequently in the narrative responses.

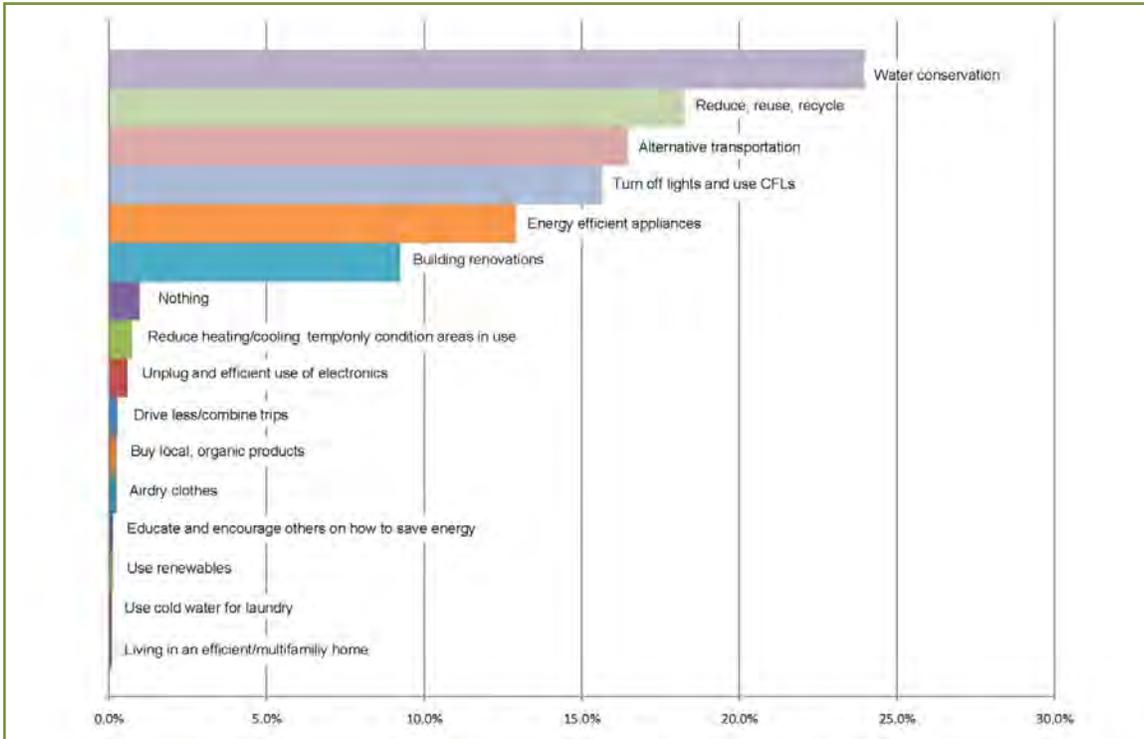


Figure 9. Responses to survey question 6: How do you save energy at home, at the office, at school, or on the road?

A number of respondents also identified that they are currently doing nothing to conserve energy, with reasons primarily falling in these four categories:

1. **Efficiency in Multi-Family Housing:** They live in a MF building which they feel is inherently more energy efficient due to having shared walls and don't see the need for energy conservation;
2. **Renter Constraints:** They are renting and are not paying directly for their utilities, which means that there's no incentive because the landlord benefits from the energy efficiency actions;
3. **Technology Barriers:** They don't like the new technologies and are waiting for better options to become available; and,
4. **Financial Barriers:** The upfront cost for retrofits is a barrier at this time.

These constraints are important to keep in mind when evaluating future conservation opportunities.

Commercial Programs to Date

The City Rebound Program was the first weatherization and space and water heating upgrade program launched in 1980 and lasted through 1994. Between 1995 and 2006 commercial programs expanded to offer HVAC and lighting upgrades.

Resource Management is currently working with Ellensburg's new Downtown Association Director to help identify the businesses with the greatest needs. Free energy audits and rebates are available to help with weatherization and upgrading mechanical systems in 25 gas-heated businesses in the old historical district.

Future Commercial Conservation Opportunities

The Ellensburg commercial customer profile includes 80 large commercial customers and 1,300 medium to small commercial customers.

An estimated 10 large commercial customers have not undergone lighting upgrades or commercial mechanical system and weatherization upgrades. An estimated 600 small commercial customers have not undergone commercial lighting upgrades, and 400 have yet to upgrade the mechanical system and perform weatherization.

Municipal Conservation Efforts to Date

Between 2001 -2006 the City began investigating facility upgrades, and Ellensburg's new City Hall was completed in 2003 with energy upgrades throughout the building (insulation, windows, lighting, mechanical). The project was an adaptive reuse of an historic landmark property. In 2004 the City converted all City stop lights to LED.

A new high efficiency heat recovery heat pump and new high efficiency lighting was recently installed at the City Pool. A comprehensive energy study is presently under way at the City's Waste Treatment Plant, with anticipated recommendations available in early 2012.

Profiles in Success

Central Washington University

In 2001 Central Washington University and the Ellensburg School District became engaged in energy conservation programs. In 2004 CWU was one of only two higher education institutions to receive the Governor's Award for Excellence in Energy Management. Between 2007 and 2009 commercial efforts focused on lighting upgrades.

CWU has partnered with a private energy service company to audit the campus for conservation opportunities. Nearly \$25 million in energy efficiency upgrades were completed through a combination of State Treasurer loans, Bonneville Power (BPA) incentives and capital dollars. They achieved a reduction in natural gas consumption of 18 percent, electrical consumption by 14 percent and water savings of nearly five million gallons per year.

Recent Conservation Projects have included a lighting upgrade and pool cover for the Aquatic Center and a ventilation upgrade at the Science Facility. CWU plans to continue their conservation efforts in the future whenever funding is available through the State, BPA, the City utility or through other Federal loans and/or grants.

Twin City Foods

Over the past three years Twin City Foods has upgraded their lighting systems and replaced the large overhead doors on their refrigerated warehouse storage units. In 2011, Twin City Foods would also like to upgrade the motors on their assembly lines. An economic analysis is presently under way. Twin City Foods will be continuing their conservation efforts into the future whenever funding is available through the corporate office, BPA or through other Federal loans and/or grants. Estimated projected cost is \$50,000 to \$150,000/year, and it is recommended that cost savings and benefits be calculated.

Ellensburg School District

Over the past six years, Ellensburg's School Districts have upgraded almost all of the lighting systems, with the bulk of funding through BPA rebates. Continued opportunities in this area include upgrading many of the school district's mechanical systems.

Existing Policy Initiatives

Table 4 identifies a number of existing Comprehensive Plan Policies that lay the groundwork for energy efficiency and conservation in the City.

Table 4. Existing comprehensive plan policies for energy efficiency and conservation.

Policy LU-9-A	Encourages and supports “ Green Building Policies and Practices ”
Policy LU-3-D-5	Creates stormwater runoff designs and strategies that minimize the amount of land necessary to treat runoff from parking areas.
Policy CFU-6-C	Promotes water and energy efficiency and alternative energy sources . Promotes the use of solar and other renewable technology within the community. Promotes and supports the use of Energy Star and Green Building practices in new construction.
Policies related to Smart Growth principles	Encourages pedestrian access , revises street designs to encourage non-motorized transportation and connectivity , encourages infill and mixed-use development , and calls for revised parking requirements .

Small Wind Energy Systems

The City has made good headway with a proposed municipal code relevant to wind generation. This draft code outlines new standards for building-scale wind on individual lots within the City, including height and setback requirements. The standards are part of the land development code update (LDCU) which is anticipated to be adopted in 2012.

Non-Motorized Transportation Committee

The City has had a non-motorized transportation committee working on non-motorized issues including complete streets over the past three years. The committee has made concrete recommendations which are incorporated in the LDCU draft, including the following:

- Street design standards for new streets and improvements to existing streets. This includes the full range of street types from local streets to principal arterials and addresses lane widths, number of travel lanes, bicycle lanes, planting strips, sidewalk widths, rights-of-way widths, etc.
- Block structure and street connectivity standards for all land use districts.
- Standards to minimize the placement and height of fences along streets and sidewalks.

Economic Conditions

The 2007 Comprehensive Plan Update indicated population growth trends at a sustained rate exceeding 2% per year, with Ellensburg maintaining approximately 45% of the county’s residents. Through this projected growth the City’s goal is to remain a hub for commercial activity in the county, while maintaining a “small, compact, traditional community with an attractive central business district and similarly-developed residential areas.”¹⁷

¹⁷ 2007 Comprehensive Plan Update

This expected growth, both in population but also the associated business development that will likely follow, will result in continued growth in energy consumption unless curbed by strategies to increase efficiencies and generate alternative sources of accessible, affordable renewable energy. Even with these strategies in place, it is likely that at some point in the future the City will move from the Bonneville Power Administration's current, more economical Tier 1 power pricing for electricity, into the next, higher Tier 2 power pricing, bumping up rates for consumers. One of the intentions of this strategy will be to delay the need to move into Tier 2 power pricing – essentially buying time at the lower rate through energy efficiency and conservation.

The implementation efforts of the EE&CS, however, will need to be grounded in realistic expectations of what the City can reasonably manage. Limited staffing capacity is a common theme that many municipalities are dealing with as they try to balance growing demand to support consumers and industry to meet green building and energy efficiency goals with shrinking budgets. While this strategy may present a multitude of ideas and recommendations, the City will want to pace implementation to both match current market readiness with goals of developing new demand as a leader in the region, while not overwhelming the staff responsible for implementation. Outside resources such as green building professional or trade organizations and any research efforts from the University provide additional mechanisms for expertise to support the staff and community needs.

As the owner of its own electric, gas, water, and sewer utilities, the City has long been a proponent of energy efficiency and conservation. Its Energy Services Department has been a leader in investing conservation funds available from the Bonneville Power Administration (BPA), and won national attention when it created the first municipal solar park, Ellensburg Community Renewable Park in Rotary Park, in 2006. In recent years, the City and Economic Development planners have become concerned about the possibility that new development in the City will be constrained due to rising costs of electricity. BPA's Tier 2 (higher) power pricing for electricity would be triggered if the City's combined electricity needs (including the new development) exceeds BPA's generation capacity tied to Tier 1 (existing) power pricing.

V. Ellensburg EE&CS

Part of the EE&CS process included identifying a shared vision for the community and then articulating goals to help achieve that vision. Focus areas and associated implementation strategies further lay the foundation for energy efficiency and conservation, and case studies provide inspiration and ideas for implementation.

Vision Statement

A vision statement is intended to describe an idealized future condition. As noted earlier, proactively promoting energy efficiency and the use of renewable energy has been a part of the City's culture for some time, as has economic development. However, the EE&CS is an opportunity to make this vision explicit and to add the concept of sustainability. Discussions with key stakeholders and community input support a vision of: ***“A community that fosters resource sustainability and economic development through energy efficiency and the use of renewable energy.”***

Goals

Goals represent steps toward achieving that vision. There are many ways to achieve it, but only certain goals are appropriate to a given community setting. Discussions with key stakeholders and community input support the following goals:

1. Maintain City leadership role in energy conservation and renewable energy production.

The City has already demonstrated leadership in both energy conservation and renewable energy production. The EE&CS provides structure and guidance for decision making for future programs. The EE&CS also describes the progress already made by the community in this regard and thus creates a benchmark to measure progress in the future. The EE&CS process has revealed a desire in the community for the City to become a resource hub for energy efficiency and green building and to streamline its processes to enable implementation of sustainable building practices. Finally, the EE&CS process has revealed interest in specific innovations that may be tested by the City in pilot projects.

2. Ensure City codes and policies foster energy conservation and the production of renewable energy.

The EE&CS process has been an opportunity to review codes and policies to identify barriers to implementation of energy efficiency and conservation and renewable energy production. Barriers include specific prohibitions, potentially burdensome requirements, and silence on an issue. By identifying these barriers (see Code Barriers to Energy Efficiency and Renewables above, and Appendix 6 for a full gap analysis), the City now has the opportunity to remedy or mitigate these barriers through code amendments and enabling ordinances. In addition, the City, when considering new policies or revisiting existing ones, can add the consideration of the policies' impact on energy efficiency, conservation, and renewable energy production.

3. Create community wide opportunities for energy conservation and renewable energy production.

In the EE&CS process key stakeholders and the public revealed a preference to promote energy conservation and renewable energy production in the community on a voluntary basis. In particular, community members stressed partnering with local businesses, educational institutions, and other local partners in order to: conduct workshops and community action campaigns; make implementation easier through incentives and flexibility in permitting; and provide technical assistance. The community also expressed a strong interest in

increased opportunities for waste reduction. The emphasis on waste reduction correlates with energy conservation; hauling, treating, and disposing of waste requires energy at every step of the process (see sidebar). Recycling and reusing materials – while providing a number of environmental benefits – does not necessarily use less energy.

The importance of this goal to the community was underscored in the June 2011 Community Meeting, where a trend of implementation priorities that directly supported this goal was evident. Examples of community focused implementation themes included those that make conservation and efficiency easier, more flexible and incentivized, and education and technical assistance in the community.

4. Maximize the benefits of existing Tier 1 Power Pricing.

Key stakeholders in the community are concerned about the impact on new development and business enterprise within the City of Ellensburg if Tier 2 power pricing were to be triggered.

Reducing pressure to purchase energy at the higher Tier 2 power pricing through energy efficiency and renewable energy production can keep current costs low, and provide a significant economic benefit in the long term.

Some jurisdictions have reduced community energy use through management of peak demand – the period (or periods) when electricity demand is highest. Positive Energy, the energy efficiency program on Bainbridge Island, provides an ongoing energy dashboard to provide the community clear feedback about its energy usage. Subsequently, the island has reduced its peak consumption for two winters in a row. Peak demand management means implementing strategies to spread electricity use more evenly throughout the day and throughout the year, ‘moderating’ the peak, and reducing pressure on electricity generation as a whole. This reduced pressure on overall capacity, combined with increased renewable energy production, can help avoid the need for new generation (and potentially Tier 2 power pricing). A secondary, but significant, benefit is avoiding the need for any new fossil fuel generation, which may be needed if electricity demand in Washington continues to rise.

Reduce, Reuse, Recycle

Most of us are familiar with the ‘three Rs’ – Reduce, Reuse, and Recycle. They’re among the first environmental practices we learn. However, for purposes of this EE&CS, it should be noted that they are not all equal in terms of environmental benefit; they are, in fact, a hierarchy.

From the perspective of energy efficiency and conservation, reducing material use means reduced energy use from all phases of the product’s life: construction, transportation, use, and disposal. While both product reuse and recycling have other environmental benefits, they do not necessarily result in reduced energy use. Therefore, material use and waste reduction are a higher priority in this EE&CS than reuse or recycling.

Focus Areas

Implementation strategies are organized in the following seven focus areas:

1. Transportation
2. Economic Development
3. Green Buildings and Infrastructure
4. Existing Buildings
5. Renewable Energy
6. Energy Access and Equity
7. Energy Efficient Development and Smart Growth

These focus areas were vetted and discussed with the City and Community, from a larger pool of potential focus areas. Through the public involvement process, they were refined, approved, and discussed in terms of

implementation strategies that could be an appropriate fit for Ellensburg. These focus areas also directly support the higher level Goals established, as shown in Figure 10. As is often the case, there is overlap with focus areas supporting multiple goals, and the delineation between them is certainly not black and white.

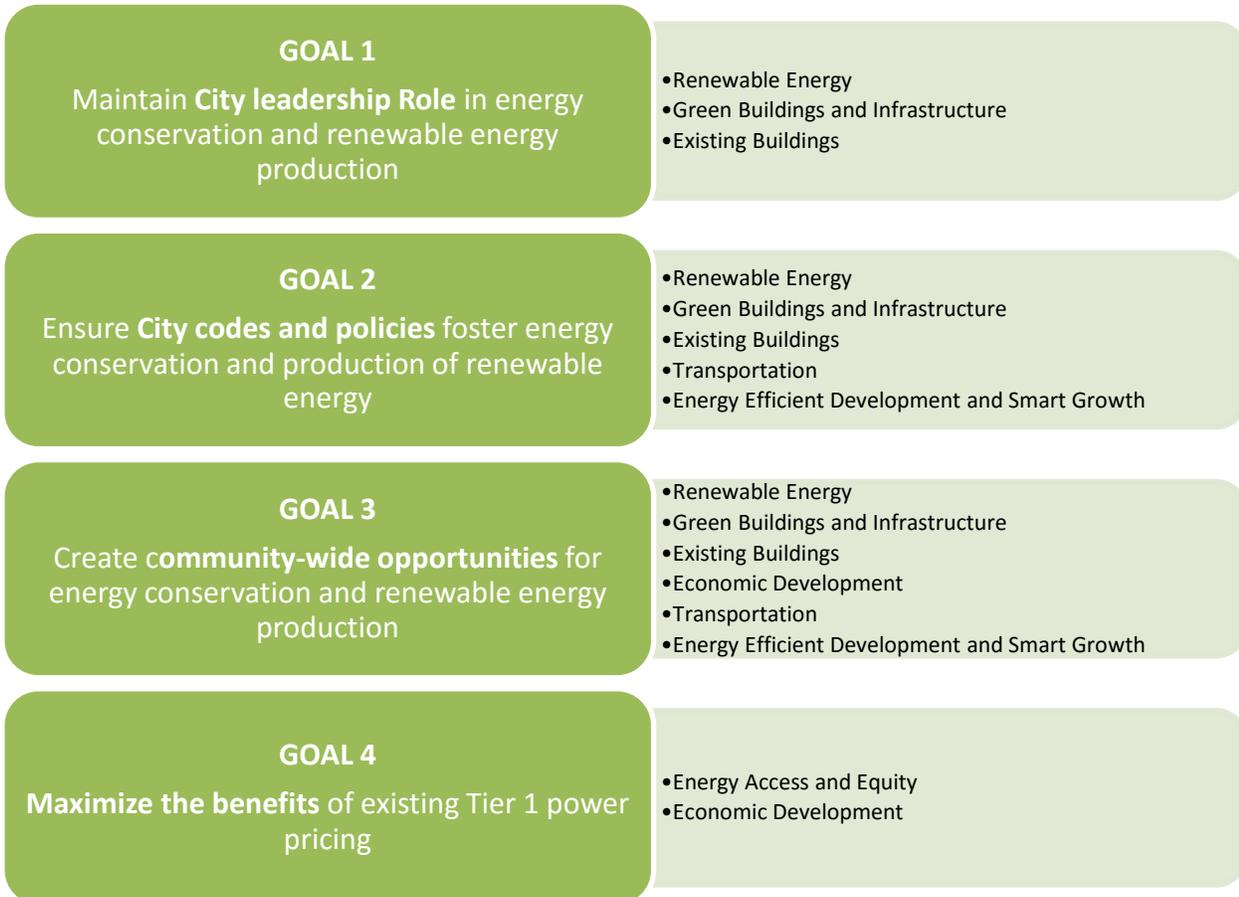


Figure 10. EE&CS goals and corresponding focus areas.

Each focus area is discussed below, with a brief overview of the focus area scope, the kinds of benefits anticipated as a result, and examples of possible implementation strategies that arose in discussions with the City and community or were an appropriate fit for the City. Sample Implementation Strategies are intended to provide inspiration and to suggest potential avenues for achieving energy efficiency and conservation goals. They do not represent City commitments to a given course of action. Additional implementation strategy suggestions from the Community meeting are available in Appendix 3: Community Workshop 2 Summary, but this summary is not a comprehensive or fully vetted list of strategies. Note that latter portions of this strategy include a vetting process and tool to help further refine those strategies to include in actual action planning, as well as tips and suggestions for selecting indicators to help measure the outcomes and success of the strategy implementation.

1. Transportation

Transportation accounts for 27% of energy consumption in the US.¹⁸ So many different aspects of life depend on transportation: getting to work or school, the distribution of food and other goods, running local errands

¹⁸ USEIA

and travel outside the city, to name a few. Because it accounts for almost a third of energy consumption in the US, transportation is not an uncommon focus area for communities developing an EE&CS. Cities and the public have numerous opportunities to both reduce or consolidate the amount of trips made, but also to choose, foster or develop smarter, healthier and more energy efficient transportation modes.

Focus Area Benefits

Focusing on transportation as an energy conservation and efficiency measure will result in financial, health, and environmental benefits for residents and can also increase the sense of community and contribute to a more vibrant economy.

A typical household in Ellensburg spends \$788 on transportation costs per month – equivalent to 0.58 metric tons of CO₂, or 1.3 barrels of oil – which takes about 2,300 trees to absorb that partial metric ton.¹⁹ This presents a significant opportunity of financial savings at a very personal level for Ellensburg residents, while also offering tremendous impact in reducing greenhouse gas emissions at the community scale.

Planning for multi-modal transportation can increase pedestrian, cyclist and driver safety while reducing traffic congestion – a win-win situation regardless of the transportation choice. Getting people out of the car and into the streets with safe and pleasing pedestrian pathways helps to build a more vibrant community and encourages street appeal. It can also create connectivity – which is critical in a community like Ellensburg with large student, senior and job commuter populations. Finally, the transportation strategies discussed below would result in local air quality benefits, improving environmental conditions for all residents.

Multi-modal Transportation

The City of Ellensburg is committed to providing a multi-modal transportation system that provides the infrastructure needed to make getting around by foot, bicycle, transit, or auto both as safe and as pleasant as possible for all citizens. The Land Use Development Code Update will implement policies and goals promoted in the 2008 Nonmotorized Transportation Plan to establish a connected, hierarchical network of streets, sidewalks and bike routes that minimizes distances between destinations. Streets will be designed to buffer pedestrians from auto traffic and to reduce speed in residential areas. New bike lanes will avoid “dooring” hazards to cyclists. Making it easier to bike or walk in lieu of driving saves energy, reduces pollution and increases health and quality of life.

Implementation Strategy Ideas

Key elements of the transportation focus area include transportation infrastructure such as pedestrian and biking infrastructure, multi-modal options such as Public Transit, and fuel consumption reduction. These three implementation categories encompass many of the strategies that could be a good fit for Ellensburg. Transportation strategies for Ellensburg might have some similarities and some big differences from those implemented in a large metropolitan city, or even other similarly sized cities. Those that resonated with the City and community and also seem to be a good fit emphasize creating connectivity. Making alternative transportation more enjoyable, flexible, accessible, and safe are among the examples shown in Table 5.

¹⁹ Calculated using Abogo.com for the City of Ellensburg.

Table 5. Focus Area 1: Transportation - implementation categories and associated sample strategies.

Implementation Categories	Sample Implementation Strategies
Pedestrian & Biking Infrastructure	<ul style="list-style-type: none"> ✓ Open up cul de sacs for pedestrian walkways. ✓ Reclaim alley ways as pedestrian thoroughfares. ✓ Apply to become a 'Walk Friendly' community. ✓ Make new streets connect to existing streets and places. ✓ Add planting strip buffers between sidewalks and travelways. ✓ Add bike routes to existing travelways.
Public Transit	<ul style="list-style-type: none"> ✓ Expand service areas at least to city limits. ✓ Educate the public that public transit is available to all. ✓ Increase route frequency. ✓ Add bus shelters/ benches at stops to make more visible and appealing. ✓ Work with carsharing companies to add stations near student housing or the University to lessen the need to bring cars to school.
Fuel Consumption Reduction	<ul style="list-style-type: none"> ✓ Consider roundabouts to reduce fuel consumption, calm traffic, increase automobile capacity and traffic safety. Good design can address any potential conflicts with pedestrian safety. ✓ Install electric vehicle charging stations at city owned parking lots/ properties.

“Improve walking and biking accommodations to reduce community energy use...”

Community Survey Response

2. Economic Development

Economic development is a natural pick as a focus area for the EE&CS - Ellensburg’s geography, local resources, and local institutional research with Central Washington University have positioned Ellensburg as a leader in the green energy economy. The Ellensburg Innovation Partnership Zone (IPZ) is one of 12 in Washington State. Encouraging renewable power generation fuels the local economy with green-collar jobs, research and innovation, tourism, and stimulates business sales in renewable energy systems products and green power.

Focus Area Benefits

Ellensburg could balance energy efficiency and economic development by increasing renewable energy production and marketing the City as a renewable energy resource hub. Opportunities exist to continue to partner with CWU on renewable energy research and support the work accomplished through the IPZ. CWU is considering developing a green energy degree program, creating a unique chance to capitalize on the talent pool of CWU students and graduates. The combination of renewable technology industry development with on-the-ground needs for solar installations, weatherization, and retrofit work is then supportive of local job creation opportunities – showing how the benefits from economic development can be both up and downstream of the effort.

Implementation Strategy Ideas

The bulk of ideas generated by the community focused on financial incentives and education as means to encourage economic development. Strategies from both of these implementation categories could be simultaneously launched: early adopters would reap financial benefits early on, spurring interest in the

mainstream market to learn about energy efficiency strategies that tap into financial rewards through educational offerings. Table 6 provides sample implementation strategies for Economic Development.

Table 6. Focus Area 2: Economic Development - implementation categories and associated sample strategies.

Implementation Categories	Sample Implementation Strategies
Education	<ul style="list-style-type: none"> ✓ Create and launch a municipal Green Business Program (<i>see case studies</i>). ✓ Provide training/education to contractors for energy efficient retrofits, weatherization and new green building construction.
Financial Incentives	<ul style="list-style-type: none"> ✓ Offer cost breaks for exemplary green developments, such as reduced permit fees. ✓ Create an expedited permitting system for green developments. ✓ Incentivize eco-development through tax breaks to renewable power businesses located within the Innovation Partnership Zone.
Recognition and Promotion	<ul style="list-style-type: none"> ✓ Create and launch a Buy Local campaign.

3. Green Buildings and Infrastructure

The Green Buildings and Infrastructure Focus Area targets both new construction and renovation to existing buildings, as well as city infrastructure (Note that Focus Area 4 provides a more in-depth exploration of existing buildings). Targeting conservation in these areas is a good investment – the aggregate amount of energy saved across a portfolio of facilities can be significant, and while there may be some up front costs, they are far less expensive than building new transmission lines or pipelines to deliver additional needed energy.

“The City should set an example by operating its facilities (buildings, vehicles, etc.) in an energy efficient and cost effective manner.”

Community Survey Response

Focus Area Benefits

Numerous resources exist to serve as guides for this focus area – such as rating systems for commercial, residential and site development. Many of these rating systems also offer guidance and application in areas outside of energy, which have implicit impacts on energy. A key example is the connection between water and energy, as heating, transporting, pumping, and cleaning water all require significant amounts of energy – whether it be in residential, commercial or industrial applications. Many of the rating systems have entire categories devoted to water strategies, so pursuing certification offers direct energy impacts through multiple avenues.

Because this focus area encompasses the development and operations of new and existing buildings and infrastructure, it can realize energy savings across the board that translates easily to financial savings. Greener buildings can garner higher rents and/or higher leasing velocity, and higher resale value, may be less expensive to operate and maintain, and typically improve the health and productivity of the building occupants. Furthermore, green building supports community waste reduction efforts, emphasizing reduced construction and demolition waste and use of recycled and recyclable materials in building construction. More than half of all metropolitan cities have or are developing a sustainability plan with a focus on green, energy efficient buildings. As a smaller city, Ellensburg is maintaining real leadership in this area!²⁰

²⁰ *Environmental Leader, 2009*

Implementation Strategy Ideas

Table 7 provides example implementation strategies for green building and infrastructure which cover both municipal and community-led efforts. Because many of the strategies recommended will benefit in multiple focus areas, several of these recommendations cross over with the Economic Development and Existing Buildings Focus Areas.

Table 7. Focus Area 3: Green Building and Infrastructure - implementation categories and associated sample strategies.

Implementation Categories	Sample Implementation Strategies
Municipal Leadership for New Construction	<ul style="list-style-type: none"> ✓ Create and launch a city Green Building Program. <i>(see case studies)</i> ✓ Consider LEED Certification techniques and/or lifecycle cost analysis for new municipal buildings
New Construction – Private Sector	<ul style="list-style-type: none"> ✓ Offer cost breaks for exemplary green developments, such as reduced permit fees. ✓ Create an expedited permitting system for green developments. ✓ Incentivize eco-development through tax breaks to renewable power businesses located within the Innovation Partnership Zone.
Efficient City Operations	<ul style="list-style-type: none"> ✓ Consider the LEED for Existing Buildings: Operations & Maintenance rating system to reduce ongoing operational energy ✓ Increase efficiency of pumping stations.

Rating Systems as Resources

Energy Specific Rating Systems

The [Energy Star](#) rating system is the most well established rating system offering guidance solely focused on improving the energy performance of new construction homes. Homes earn the certification through a suite of energy efficiency improvements that together achieve efficiencies greater than 15-30% of standard homes. Energy Star Certification is also available for commercial buildings and facilities, which involves using the [Energy Star Portfolio Manager](#) tool. Portfolio Manager helps buildings track and manage energy and water consumption, and rates a building's performance compared to similar buildings nationwide.

Comprehensive Green Building Rating Systems

Another resource comes in the form of rating systems that offer more comprehensive goals and strategies for green building, which have specific components with detailed guidance or parameters that focus on energy in addition to other categories, such as project site, materials, and indoor environmental quality. The main rating systems that fall in this realm include:

- [LEED Rating System](#) (a suite of rating systems that applies to many different building and project types)
- [BuiltGreen](#) Rating System (residential and multi-family construction and remodeling)
- [Living Building Challenge](#)
- [Evergreen Sustainable Development Standard](#) (affordable housing projects)

Although the following rating systems do not have specific energy efficiency and conservation requirements, they do offer significant indirect impacts on energy conservation through other aspects, such as project siting and transportation, the water-energy connection, and energy impacts from construction:

- [Sustainable SITES Initiative](#)
- [Salmon Safe](#)
- [The Greenroads Rating System](#)
- [WaterSense](#)

4. Existing Buildings

Buildings account for 40% of energy consumption in the US.²¹ Constructing new energy efficient buildings only addresses part of the challenge to reduce energy consumption. Renovating the buildings in which we live, work, learn, and gather is a significant step toward reducing energy consumption, saving money, and improving the vibrancy of Ellensburg. In addition to renovations, a lot of energy can be saved merely by how buildings are operated and maintained – by occupants *and* homeowners.

Focus Area Benefits

Historic buildings give Ellensburg its unique character. Currently, many downtown historic building are underutilized or vacant. Renovating/redeveloping these historic buildings presents an opportunity for economic development (Focus Area 2) with the challenge of balancing historic preservation or building code requirements. Adaptive reuse of existing buildings (first Implementation Category, below) can represent a significant energy and waste savings over demolition and new construction, with less building materials going to the landfill, and reduced need for new building materials. Older buildings may require substantial retrofits, however, in order to make them truly energy efficient.

²¹ *Architecture 2030*

Especially with city support, this focus area is accessible to renters, homeowners, and business owners, offering tangible savings through reduced bills while making buildings more comfortable to dwell or work in at the same time.

“Offer resources for simple and effective energy efficient upgrades to buildings”

Community Survey Response

Implementation Strategy Ideas

Table 8 provides sample implementation strategies for three implementation categories associated with existing buildings.

Table 8. Focus Area 4: Existing Buildings - implementation categories and associated sample strategies.

Implementation Categories	Sample Implementation Strategies
Adaptive Reuse	<ul style="list-style-type: none"> ✓ Provide incentives to renovate historic buildings in the downtown core. ✓ Use infill development strategies and mixed-use development with live/work properties. ✓ Discourage demolition of existing buildings through demolition fees.
Energy Consumption Reduction	<ul style="list-style-type: none"> ✓ Give greater local visibility and support to the Efficiency First building energy disclosure ordinance to promote energy efficiency building strategies. ✓ Adopt an outcome-based energy code compliance path for renovation and retrofitting of existing buildings. ✓ Promote incentives for cost-effective energy retrofit strategies and streamline the process.
Efficient Operations	<ul style="list-style-type: none"> ✓ Follow the LEED for Existing Buildings: Operations & Maintenance rating system to reduce ongoing operational energy. ✓ Offer energy efficient maintenance education for homeowners, renters, and the affordable housing community.

In addition to the implementation categories above, two other factors that play into this focus area are historic preservation and the connection between water and energy. While not a key focus area, the Ellensburg community did note through the process the potential connection between the two constants of underutilized/vacant historic buildings and a student population. Preserving historic buildings and bringing new life through a unique demographic not only supports the Existing Building Focus Area, but also can contribute to a more thriving downtown core. Many of the sample implementation strategies in the table above could support this connection.

In addition, the water/energy connection discussed under 'Green Buildings and Infrastructure' Focus Area also presents energy efficiency opportunities for existing buildings.

5. Renewable Energy

Renewable Energy comes from sources that are not depleted by use. Ways to capture energy include photovoltaics (PV), solar thermal, wind energy systems, and biomass conversion. Renewable energy generation and energy efficiency go hand-in-hand as strategies to reduce Ellensburg's demand on fossil fuel energy and in turn reduce the impact of future increases to the cost of fuel. Ellensburg's natural assets in solar and wind access, along with potential for tapping the local agriculture industry for biomass power, makes investment in renewable energy a good fit for Ellensburg.

Focus Area Benefits

This focus area builds on existing success in the City – the Ellensburg Community Renewable Park is recognized as the first community solar farm in the US. In 2009 the Community Renewable Park was selected to be part of the Pacific Northwest Smart Grid Demonstration Project, receiving a \$750,000-plus matching grant from the Department of Energy to help finance the thin film solar modules, solar concentrating dishes and wind turbines. The Community Renewables Park offered community members the opportunity to invest in green power for as little as \$250. Increased spotlight on renewable energy as a focus area will breed more success in the park with the potential to add small scale wind power systems.

Renewable energy provides direct financial payback as a benefit to those who invest. Already, Ellensburg encourages utility customers to install their own renewable energy systems such as solar PV. In August 2007, City Council approved a Net Metering Policy (Ordinance 4491) that ensures customers are credited for the excess power generated and delivered onto the city's local transmission system. In addition, residents who install solar PV systems qualify for State Solar Production Incentives at \$0.15 - \$0.45/kWh up to \$5000 per year through 2020. In addition, the City has drafted an Ordinance to guide installation of small wind turbines.

LEED-EB O+M and LEED NC – What's the Difference?

The suite of LEED rating systems addresses different project types (including residential, neighborhood development, and tenant improvement projects for example). LEED for Existing Buildings: Operation and Maintenance and LEED for New Construction (LEED-NC) are both excellent tools that match the City's focus areas of Green Buildings and Infrastructure and Existing Buildings.

It's important to understand that these two rating systems are not simply the same structure overlaid on different building types. The fundamental difference between these two rating systems is that EB: O&M is performance based. This means computer models that show the building is energy-efficient do not count; instead, actual energy measured by utility bills is considered.

Successful EB: O&M projects rely on the people who run them every day (facilities professionals and building engineers), whereas LEED-NC projects rely on architects and contractors. With EB: O&M, tenants have a role to play, too, which makes tenant or resident education about energy efficient behavior or understanding of building technologies or systems even more important. Finally, EB: O&M requires recertification. The purpose of recertification is to provide properties a way to demonstrate their ongoing commitment to sustainable operations and maintenance practices.

Implementation Strategy Ideas

The corresponding example implementation strategies associated with eco-districts, and expansion of existing renewable energy investments are shown in Table 9.

Table 9. Focus Area 5: Renewable Energy - implementation categories and associated sample strategies.

Implementation Categories	Sample Implementation Strategies
Eco-Districts	<ul style="list-style-type: none"> ✓ Establish a ‘solar district’ in the City (<i>see case studies</i>). ✓ Define standards for neighborhood scale systems. ✓ Pre-wire new buildings for future retrofit installations of solar.
Expansion of Existing Renewable Investments	<ul style="list-style-type: none"> ✓ Continue to expand solar opportunities in the City. ✓ Increase focus to include solar water heating. ✓ Develop flexible thresholds for homeowners before requiring engineering assessments for solar PV or water.

It is also worth noting that while wind and solar were the most commonly referenced sources of renewable energy for Ellensburg, some members of the community expressed a preference for focusing on solar rather than wind.

6. Energy Access and Equity

Rising energy costs are particularly burdensome on fixed-income and low-income populations. At the same time, investments in energy efficiency are generally beyond the means of these populations, or are not accessible due to lack of ownership. The EE&CS should take these populations into account to avoid inequities in access to energy efficiency, and clean, affordable energy.

Focus Area Benefits

Electricity costs will rise in the future, and natural gas costs vary greatly over time so providing a means for customers to control usage is beneficial. The conversation in Ellensburg about moving from Tier 1 to Tier 2 power pricing has begun, and was a driver for including equity issues into the EE&CS.

The City already has a firm footing in this focus area, with local groups like Hope Source along with the City’s long standing efforts for low-income housing weatherization.

Additionally, this focus area directly targets the student demographic who have historically been underprepared for higher heating and cooling costs, and are more limited in actions they can take to make changes in their rental.

“Lower energy bills”

Community Survey Response

Implementation Strategy Ideas

Education about low-cost energy efficiency improvements was a key theme for this focus area, as it can help homeowners make smart decisions about where to spend money to achieve energy efficiency savings. The June 2008 issue of the Journal of Light Construction notes, “Replacing old single-pane windows with new double pane low-e units certainly saves energy. But the cost is so high – and the amount of energy saved is so low – that window replacement is almost never cost-effective.” And yet, changing windows is typically one of the first things homeowners consider when performing an energy retrofit. In addition to helping owners make smart decisions, education also can influence behavioral changes that have energy impacts, which is directly

applicable to rental communities as well. Table 10 illustrates the sample implementation strategies relevant to energy access and equity.

Table 10. Focus Area 6: Energy Access and Equity - implementation categories and associated sample strategies.

Implementation Categories	Sample Implementation Strategies
Affordable Energy Structures	<ul style="list-style-type: none"> ✓ Establish rate structures that offer customer incentives for decreasing electricity use. ✓ Offer incentives to improve efficiency and reduce waste. ✓ Target college rental housing for weatherization programs.
Education	<ul style="list-style-type: none"> ✓ Include informational handouts and tips with energy bills, targeted especially to college students. ✓ Incorporate more energy efficiency education in the K-12 system. ✓ Advertise the process for accessing utility usage history prior to renting or buying a home. ✓ Emphasize that energy efficiency measures should be prioritized based on effectiveness (see window replacement example in this section)
Energy Efficiency Substitutes	<ul style="list-style-type: none"> ✓ Host a ‘take back’ program or pick up operation to make replacing inefficient appliances easier.

7. Energy Efficient Development and Smart Growth.

Community energy use can be reduced by building energy efficient housing and denser, more walkable neighborhoods. This reduces both the building-level energy consumption as well as energy associated with transportation and services, as it encourages infill redevelopment so services are closer. Proximity to services is also correlated to reduced consumption and packaging, which may support community waste reduction efforts. Smart growth can also extend beyond just buildings to include urban/localized food production.

Focus Area Benefits

Smart growth preserves the much-loved characteristics of the area. It means protecting the rural landscape and outdoor recreation opportunities which are both a tourist draw and a reason to live in Ellensburg. Denser development and infill can create a more vibrant, lively downtown, which also boosts business in the corridor, thereby supporting economic development goals. This focus area is also directly supported by the work done under the Land Use Development Code Update Process.

Implementation Strategy Ideas

Many of the implementation ideas focused on easing regulations and offering incentives, particularly in the downtown corridor, and are shown in Table 11 below.

Table 11. Focus Area 7: Energy Efficient Development and Smart Growth - implementation categories and associated sample strategies.

Implementation Categories	Sample Implementation Strategies
LDCU Ideas	<ul style="list-style-type: none"> ✓ Offer new construction incentives (density bonuses) and existing building incentives (retrofits) to encourage downtown living. ✓ Implement standards that encourage passive orientation and protect solar access. ✓ Focus on mixed use and commercial neighborhood development. ✓ Encourage energy efficient Alternate Dwelling Units, cottage housing and community land trust options – particularly for seniors in the community.
Green Business Program	<ul style="list-style-type: none"> ✓ Craft incentives for energy efficiency and/or renewable energy as part of the program. ✓ Offer technical assistance for property owners who want to invest in energy efficiency and/or renewable energy and solar water heating.
Demonstration Projects	<ul style="list-style-type: none"> ✓ Offer provisions for small scale energy systems. ✓ Create pilot opportunities to test and allow for code flexibility in high performance projects.

Case Studies

Even when a City is a pioneer in a particular effort, there are clear advantages to learning from similar efforts elsewhere. Cross-pollination helps seed new ideas and approaches from one city to the next. As part of this EE&CS, four case studies were developed to offer insight on what has worked in other jurisdictions.

Just as this Strategy reflects what the EE&CS development process revealed for Ellensburg, these case studies reflect efforts and outcomes that are highly specific to an individual community’s goals and particular needs. Recognizing that no program or policy is fully transferable from one jurisdiction to another, case studies were vetted wherever possible for those that are more representative of communities who shared certain elements with Ellensburg, such as similar size, or a university campus with student presence in the city, or surrounded by outdoor recreational opportunities, for example.

Case studies for several ideas that have particular merit and interest focus on the following themes:

- Conducting a community-wide energy challenge and/or competition,
- Creating a green building and/or business program,
- Conducting an energy neighborhood or district initiative, and
- Expanding the electrical vehicle infrastructure.

Each case study theme includes an introduction to the theme and why the theme reflects a best practice or priority from the EE&CS process, brief examples from two cities, suggestions for how the effort might look in Ellensburg, and resources for more information. In addition to providing useful information, these case studies can generate a sense of inspiration and encouragement at the innovative and thoughtful ways that jurisdictions around the region and the country are pursuing a more sustainable future. This approach is consistent with the City’s goal of using this EE&CS not as a guided roadmap for specific implementation steps, but as a launching pad for ideas to be further investigated and vetted.

Case Studies

Energy Challenges and Competitions

In community discussions for Ellensburg's EE&CS, implementation approaches ranged in order of preference from education, incentives, to requirements. Social marketing experts (both from within and outside of sustainability arenas) have suggested methods that rely on self-interest, exchange, competition, and free choice as a means of increasing community participation and engagement without the need for additional regulations. In recent years, communities, businesses, and colleges around the country have used challenges and competitions to foster energy efficiency and the use of renewable technologies. This approach is based on social science research, which shows that it works. One landmark study in California found that residents were more than three times likelier to reduce energy use based on competition with neighbors than through either education or positive messaging (i.e. 'it's the right thing to do'). Dozens of cities, towns, neighborhoods, and campuses have used competition to drive energy use reduction, often resulting in millions of dollars saved, in addition to millions of kilowatt-hours.

Bellingham, WA Green Power Challenge

Bellingham is a small town with a thriving college campus that has taken great strides to involve community, business and government in elevating the awareness and purchase of clean energy options. In 2006, Bellingham's Green Power community purchases grew from 0.5% to nearly 12% of the total power used in just six months. As a result Bellingham became the #1 EPA certified Green Power Community in America, because residents, 100 local businesses, the city and county governments, and Western Washington University answered the call to use and buy renewable energy. As a result of these purchases, PSE built two solar electric demonstration projects in Bellingham. The Green Power Community Challenge was a collaboration between Sustainable Connections, a non-profit operating in Bellingham, Puget Sound Energy and the City of Bellingham.

Keys to Success

- Partnership between the City and a local non-profit
- Engagement of the business community
- Engagement of a large local student population
- Participation of the utility

Minnesota Energy Challenge

Launched in 2006 by the local nonprofit Center for Energy and Environment, the web-based Energy Challenge provides in-depth guides to energy efficiency and conservation actions, as well as information



Demonstration solar project installed by Puget Sound Energy with Green Power funds from the Green Power Challenge

Resources

Bellingham Green Power Challenge

<http://sustainableconnections.org/energy/greenpower>

Minnesota Energy Challenge

<http://www.mnenergychallenge.org/>

PreCourt Energy Efficiency Center at Stanford – behavior change resources

<http://peec.stanford.edu/behavior/>

College Campus Dormitory Energy Challenges

<http://www.youtube.com/watch?v=W41uaTILaSc>

Encouraging Energy Efficiency through Competition

<http://www.iowapolicyproject.org/2011Research/110602-EE-competition.html>

about savings and cost. Individuals can join teams for their city, business, congregation, school, neighborhood and other community organizations and use the Energy Challenge to track their group savings, which are listed on the website. The CEE also provides a speaker for these teams to assist with conducting a month-long Energy Challenge Campaign. Participation costs nothing. The program is promoted to renters and homeowners, adults and youth. There are many teams listed on the site, and the rankings are shown for the top ten teams in each category. In 2008, the City of Minneapolis issued an energy challenge, asking individual citizens to pledge to reduce their energy consumption. The grand prize winner received a home makeover with \$15,000 worth of energy efficient improvements. In aggregate the program is saving 224,574,568 lbs. of CO₂ and \$13,094,892 annually with 27,640 participants and over 1,133 teams.

Keys to Success

- Partnership between the City and a local non-profit
- Diverse 'Challenge Team' options
- Free assistance offered to teams
- Participation is free

What Would It Take to Do This in Ellensburg?

These programs are generally short term (e.g. six months) private-public sector collaborations. The scope of these competitions and challenges vary widely, and as such so has the cost. However, it is possible to conduct a successful program relying heavily on community volunteers, as long as the "prize" or incentive, such as tickets to the annual Ellensburg Rodeo or Jazz in the Valley events, is valued in the community. On Bainbridge Island, WA, local churches have gotten involved in the local RePower program. St. Barnabas Episcopal Church has signed up for assessment of its church building, and has challenged itself to get a specific percentage of their congregation signed up for home energy efficiency check-ups. As part of this effort, church members will be helping low-income residents with their energy upgrades.

In the case study examples above, an environmental non-profit was either the lead organization or a significant partner. In Ellensburg, the local chapter of the Northwest EcoBuilding Guild may be a natural partner and the Chamber of Commerce a good ally.

Both example programs were successful because "everyone could play." With the Minnesota Energy Challenge their outreach specifically reaches out to renters and youth. In Ellensburg, teams could be made up of student renters, dorms, artist cooperatives, Main Street businesses and more. Many college and university campuses around the US conduct annual energy competitions and provide how-to guides and reports online. Tying these types of competition into significant local celebrations can provide inspiration and exposure for teams that rank high. In addition to tapping into the citizenry's natural competitive and self-reliant characteristic, this grass-roots approach can avoid onerous administrative responsibility on the part of the City.

Case Studies

Green Business and Building Programs

Municipal green business and building programs are a proven route to provoking and fostering change in the community because of the flexibility of programming and assistance that can be offered through the programs in response to current market needs. Among other things, these programs can be a source of resources, education and outreach – laying the groundwork for easier implementation of help-lines, free technical assistance, award or recognition programs, or requirements.

Kirkland, WA Green Building and Business Programs

The City of Kirkland runs a Green Building Program offering education, expedited permit review, and technical assistance, as well as a recognition program for green businesses. The Kirkland Green Business designation is available in the following categories: green building, recycling, water conservation, energy efficiency, transportation, and pollution prevention.

The Green Building program is run by a team comprised of staff from the planning, building, and public works departments. They are all LEED Accredited Professionals and the program won a “Built Green Hammer Award” in 2008 for their programs supporting green building. The business program is a collaboration of the City of Kirkland, Kirkland Chamber of Commerce, and Puget Sound Energy. Since 2007, the Kirkland Green Business program has recognized over 80 businesses.

Keys to Success

- Program is voluntary
- Programs are simple and easy to understand
- Collaboration with utilities and local institutions

Santa Barbara, CA Green Building and Business Programs

The City of Santa Barbara also has both green business and green building programs. The green business program offers incentives and assistance to encourage businesses to implement voluntary actions. Originally run as an annual awards program, the green business program switched to a business awards program in 2008. Since then 36 businesses have been certified through the program.

The green building program includes solar design guidelines, alternative transportation program support, and a variety of resources to support projects pursuing the Built Green program run by the Contractors Association of Santa Barbara, including expedited review.

Resources



King County Roadmap to Sustainable Cities

<http://roadmap.greentools.us/>

King County Roadmap Shortcut

<http://your.kingcounty.gov/solidwaste/greenbuilding/documents/roadmap-shortcut.pdf>

City of Kirkland Green Programs

http://www.kirklandwa.gov/community/kirkland_green.htm

Building an Emerald City: Guide to creating green building policies and programs

Book by Lucia Athens

Green Buildings for Cool Cities; A guide for advocating for local green building policies

By the Sierra Club and U.S.GBC

<http://coolcities.us/resources/Energy%20Efficiency/GreenBuildingPolicy.pdf>

Built Green Central Washington

<http://www.builtgreencw.org>

Keys to Success

- Focus on voluntary actions
- Use of awards to engage business participation
- Planning and permitting assistance is free

What Would It Take to Do This in Ellensburg?

Build on the work in this EE&CS to seek support within the City and the community to start a green building program and establish a framework of priority activities and services for the program. Then identify staff and technical resources within the City that can staff the program, including community volunteers, or Built Green of Central Washington. A green business or building program can be the overarching umbrella for implementing many of the recommendations in this strategy. King County's Roadmap provides guidance for creating sustainable city programs.

Case Studies

Energy Neighborhoods and Districts

Energy neighborhoods and districts are a great tool to address opportunities with existing building stock, a focus area for Ellensburg. Bringing together building owners, businesses, and residents around a measurable goal such as installing solar or reducing neighborhood energy consumption creates a shared motivation and willingness to solve problems collectively. One reason this approach is increasingly common is that it can be applied at a variety of scales, from an urban village to a historic main street core, focusing on the neighborhood level to gain increased impact.

Bainbridge Island, WA – Grow Community

The City of Bainbridge Island’s Housing Design Demonstration Project ordinance allows increased density for sustainably-built affordable housing. The most ambitious project proposed under the ordinance is Grow Community, which features several neighborhood-scale sustainability strategies. Some are aggressive but well-established, such as LEED Gold certification and 100% solar power.

But it is the neighborhood-scale approach that sets this development apart. It goes beyond more sustainable buildings and empowers more sustainable choices for residents. Proximity to the downtown core emphasizes ‘5-minute living’ – combining the benefits of reduced automobile use and support for the local economy. Design encourages social interaction, such as community gardens where residents can grow some of their own food, and shared facilities to serve as a studio, workshop, or neighborhood party space. The project is on track to become the first in the state to receive a One Planet designation, a certification given by the BioRegional Development Group. While One Planet certification does not translate to tax breaks or other financial incentives, the developer believes that the designation will increase marketability.

Keys to Success²²

- Holistic development approach, similar to Planned Unit Development
- Aggressive targets for renewable energy and green building
- Marketing sustainable features as a selling point, rather than an added cost



Yard signs from Solarize Portland provide recognition, education, and friendly peer pressure

Resources

The Solarize Guidebook

<http://www.portlandonline.com/bps/index.cfm?c=54114>

U.S. Department of Energy Solar America Communities

www.solaramericacommunities.energy.gov/

Stanford Social Innovation Review – Collective Impact

http://www.ssireview.org/articles/entry/collective_impact

King County Steps to Health – Promoting Healthy Built Environments

<http://www.kingcounty.gov/healthservices/health/chronic/steps.aspx>

²² Note that these Keys to Success relate to the project as proposed, and not actual project performance.

Solarize Portland

Solarize Portland is a solar panel volume-purchasing program led by Portland area neighborhood associations. The program helps neighbors decide: who to hire, what to budget, and where to start. Interested neighbors come together to choose a contractor, purchase and install solar as a community, and save significant costs as a result of bulk purchasing of solar electric panels. The program was initiated by a neighborhood coalition in one neighborhood that generated enough excitement and interest to go city-wide. The City of Portland's Bureau of Planning and Sustainability, Energy Trust of Oregon and Solar Oregon offer strategic and technical assistance to neighborhood organizations that are interested in operating a Solarize project. The program also includes coordination and resources for historic districts interested in participating.

Keys to Success

- Focus on voluntary actions
- Use of awards to engage business participation
- Planning and permitting assistance is free

King County, WA – Promoting Healthy Built Environments

In 2005, Seattle/King County Public Health – as part of their *Promoting Healthy Built Environments* project – partnered with local non-profit Feet First on a pilot assessment of Seattle's Beacon Hill neighborhood. To highlight a range of transportation issues from the pedestrian perspective, Feet First led a series of 'Walking Audits' of the neighborhood. These audits included health officials, neighborhood residents, business owners, and representatives from Sound Transit, who were planning a major light rail station for Beacon Hill.

The groups assessed infrastructure, such as availability of street crossings and signal timing, as well as a number of social factors, including safety, physical activity, social connections, and access to transit and healthy food. These audits formed the basis for a [Health Impact Assessment](#) (HIA) for the light rail station, and helped to significantly improve community engagement on the topic of neighborhood walkability. Feet First created a 'Neighborhoods on Foot' map for North Beacon Hill, designed to encourage people to explore their neighborhood on foot.

One very positive sign is the participation of the Beacon Hill Merchants Association. The business group actively promotes and participates in ongoing walking audits. They recently advertised an upcoming audit on their website, as a way for the community to "help identify ways to improve the pedestrian experience and connectivity to the north and south commercial areas."

Keys to Success

- Partnership between the County and a local non-profit
- Engaging residents in assessing their own neighborhood
- Multi-modal approach to transportation planning

What Would It Take to Do This in Ellensburg?

The City of Ellensburg is a partner in the Evergreen State Solar Partnership, recently awarded by the DOE. This program creates local and regional opportunities for market and regulatory change to remove barriers and standardize permitting, getting more solar on the ground. A grassroots effort such as the [Solarize Portland](#) initiative could also be encouraged for the downtown historic core, or expansion of Ellensburg's existing Community Solar efforts to include municipal buildings that are good candidates for energy efficiency and PV installations, as part of a more comprehensive retrofit package.

Ellensburg could coordinate new and existing energy efficiency and conservation efforts with its Planned Unit Development (PUD) program, supporting holistic neighborhood or district-scale planning and development akin to the Grow Community. This approach allows early incorporation of sustainable design features such as green building, renewable energy, and walkability. The Bainbridge-based developer of the project believes that the sustainability features of the project will be a key part of its appeal.

Neighborhood and main street walkability are increasingly seen as desirable features for both tourism and locational decisions. Engaging residents to assess neighborhood transportation issues from a pedestrian perspective is an important step in the conversation about reducing personal automobile use. Transportation is the largest single source of greenhouse gas emissions in Washington, and a significant source of air and water pollution. The decision to drive less and walk (or bicycle) more is up to each individual; however, local governments play a role by supporting the development of communities where walking is practical, safe, and enjoyable.

Case Studies

Electric Vehicles

Both the City of Ellensburg and Central Washington University already have electric vehicle (EV) charging stations installed and have expressed a commitment to developing more. The Level II charger donated by Tom Saxton, a Tesla owner, and installed on the corner of Main and Third is an example of the value of EV stations to reach both Ellensburg's energy efficiency and economic development goals. Instead of fueling up on the highway, EV drivers can come to Ellensburg's historic core, plug in, and shop or eat. Put this in the context of two major federal programs funding electric vehicle charging infrastructure in the Seattle area and a state project to provide stations up and down Interstate 5. Building off this momentum and spearheading expansion across I-90 is a natural fit for Ellensburg's EE&CS.

Bellevue Connections, Bellevue, WA

The largest private installation of electric car charging ports in the country is at the corner of NE 8th and Bellevue Way NE in parking lots for Bellevue Square, Lincoln Square, and Bellevue Place. Developer Kemper Freeman has partnered with ChargePoint America to install EV charging stations networked in 15 locations. Kemper Development cannot charge for electricity, but charges for access to the parking spot. A currently charge-free public station is available at Bellevue City Hall for use while doing business at City Hall.

Keys to Success

- Focus on voluntary actions
- Use of awards to engage business participation
- Planning and permitting assistance is free

EcoTality, Tempe, AZ

EcoTality is a California-based business that received federal funding for its EV project which installs and studies the demand for its "Blink" electric vehicle charging stations in six states, including Arizona and Washington. The first installation in Arizona was in June 2011 at Monti's La Casa Vieja, an historic landmark restaurant in the heart of downtown Tempe. Two Blinks were installed there because of its proximity to major entertainment and employment hubs.

"We used to hitch horses here in the 1800s, and now we can charge up electric vehicles while diners enjoy Monti's Steakhouse," said Michael Monti, owner of Monti's. "Offering EV charging to guests at Monti's is just a new facet of the spirit of hospitality that we have offered here since 1871. We are excited to usher in a new age in Downtown Tempe."



The EV Blink charging station at Monti's La Casa Vieja steak house in Tempe
Credit: Carlos Chavez/The Arizona Republic

Resources

The Bellevue Collections – EV Information

<http://www.bellevuecollection.com/ChargingStation.php>

The Electrification Coalition

<http://www.electrificationcoalition.org/>

Federal and State Incentives for Alternative Fuels

<http://www.afdc.energy.gov/afdc/laws/>

Keys to Success

- Focus on voluntary actions
- Use of awards to engage business participation
- Planning and permitting assistance is free

What Would It Take to Do This in Ellensburg?

As Ellensburg falls outside the metropolitan areas that have large federal grants for installing electric car charging stations, focus should be on expanding community and regional partners. As demonstrated by Tom Saxton, there will be a growing group of car owners interested in venturing further and further with their vehicles. Focusing first on the historic core, Ellensburg should partner with local business, seek community development grants and seize the opportunity to make the City a primary shopping, tourism, and recharging spot on the electric highway. Also contact the Bioenergy Coordinator at the Washington State Department of Commerce for recent status on state EV programs. There were several planned programs that weren't funded at the time of this report.

VI. Implementation Process Best Practices

The EE&CS is a living document – by gathering baseline data it is intended to help track progress, and by recording community and City-vetted goals and implementation priorities, it can be used as a reference for making decisions moving forward. The living document will help the City incrementally establish an implementation plan that outlines specific strategies and associated actions for each focus area. To aid this process, this EE&CS includes the following tools and recommendations for creating a plan for moving forward:

- *A Decision Matrix*: Template tool to evaluate possible strategies against core priorities and criteria. This tool is intended to be used as a first step analysis of options.
- *An Implementation and Action Plan*: Template tool to record and track selected implementation strategies. This plan includes a high level perspective and options to record more detailed, specific actions required.
- *Best Practices*: The remaining section of this document summarizes implementation priorities as identified during the EE&CS process coupled with implementation tips and recommendations based on best practices.

It is worth noting that while these tools are intended to help identify implementation strategies that are the best fit for the City, it will also be important to step back and evaluate the sum of all strategies under consideration. Often strategies can work jointly together, or in some cases, even create conflicts or challenges for each other. Taking a holistic view of the strategies under consideration is a best practice approach that should be done regularly, perhaps as an annual review during strategy selection.

Finally, while these tools and best practices are provided for the City to make decisions that are in line with the goals and priorities identified through the process, one risk that exists when incorporating decision making tools is that the process becomes overbearing and leads to indecision, or analysis paralysis. As part of the ‘stepping back’ to evaluate the sum of strategies as a whole, the City should also realize that the process of developing this EE&CS has already instilled a sound understanding of how to move forward – sometimes without needing to do a detailed vetting process of every single decision. In some cases, action is more valuable than analysis, and learning through the process is acceptable and preferred.

Implementation Priorities

Based on the discussions and feedback at the Community Meetings and Survey, it is recommended that the general approach for implementation follow along the best practices of:

1. Start with Education
2. Offer Incentives to Ease into New Technologies or Practices
3. Transition to Requirements as Appropriate

Work with the UAC, the City, and the Community Meetings identified several implementation priority themes to be considered within these phases when assessing possible strategies moving forward. Common trends are listed in Table 12.

Table 12. Best practice approaches for implementing the EE&CS

Education
<ul style="list-style-type: none"> • Technical assistance for commercial, industrial and residential owners • Homeowner, renter, and builder education • The City as a resource hub for energy efficiency and green building • Empowerment of prospective buyers/renters with utility information before making a decision
Incentives
<ul style="list-style-type: none"> • Expanded and diverse voluntary incentive programs • Strategies that make energy efficient choices easier and more flexible
Requirements
<ul style="list-style-type: none"> • Energy consumption disclosure

Several topical implementation themes also emerged, crossing over multiple focus areas. These themes may be useful to keep in mind to help direct efforts when assessing potential strategies in the future.

- Mixed use development, clustering and infill
- Revitalization of the downtown
- Targeted strategies for the unique resident populations in Ellensburg, including students and artists
- Any opportunity to incorporate education and innovation

“Strike a balance between citizen voluntary actions and city regulations.”

Community Survey Response

Decision Matrix Template

The Decision Matrix Template provided in Appendix 7 is a tool to further evaluate strategies with criteria to help identify implementation potential for planning purposes. Figure 11 provides a snapshot view of the Decision Matrix Tool. The Criteria is intended to evaluate the investment effort and benefits of proposed Strategies. Those proposed strategies that meet multiple criteria offer significant strides in meeting the Strategy’s Vision and Goals.

The criteria included in the matrix offer quantifiable and qualitative considerations, but are not intended as a substitute for a Cost-Benefit Analysis, which should be performed before implementing any strategy. These criteria can, however, provide a “first-touch” analysis that allows the City to discover the additional benefits that a cost-effective strategy might not provide on its own. These benefits are part of the “story” that the community tells to justify its expenditures and acknowledge community achievements.

Implementation Strategy Decision Template	Relevant Focus Areas		Investment Criteria <i>Is the proposed strategy:</i>				Benefits Criteria <i>Does the proposed strategy:</i>						Decision Notes	
	Primary Focus Area	Easy to Implement	Achievable through Low 1st Cost	Reasonably Measurable Over Time	Reflect Community Priorities	Reflect Municipal Priorities	Result in Long Term Financial Savings	Significantly Reduce Energy Consumption	Foster Economic Development	Demonstrate Innovation and Leadership	Offer Educational Opportunities	Help Manage Energy Data	Comments	Approve/Reject
Proposed Strategies														
1														

Figure 11. Snapshot of Decision Matrix Template.

Examples of possible specific implementation pathways that may offer examples for strategies vetted in this Decision Matrix are discussed earlier in this document under the explanation of each of the seven focus areas.

Decision Matrix Criteria

The criteria in the matrix are separated into two categories: those that help assess the level of effort involved in implementing the strategy, and those that help assess likely benefits of the strategy. Many of these criteria come from the initial kick off meeting with the Council and several UAC members; in addition several have been used by other energy efficiency strategies published nationwide.

1. Strategy Selection Criteria that measure the level of effort to implement
Is the strategy:
 - a. Easy to Implement
 - b. Achievable through Low First Cost Investment
 - c. Reasonably Measurable Over Time

2. Strategy Selection Criteria that measure the benefit of the strategy
Does the strategy:
 - a. Reflect Community Priorities²³
 - b. Reflect Municipal Priorities²⁴
 - c. Result in Significant Long Term Financial Savings
 - d. Significantly Reduce Energy Consumption
 - e. Foster Economic Development
 - f. Demonstrate Innovation and Leadership
 - g. Offer Educational Opportunities
 - h. Help Manage Energy Data²⁵

Using the Decision Matrix

The Decision Matrix Template is a blank Excel Spreadsheet. It can be used in a group format to collectively evaluate proposed strategies, or individual comparisons may be shared and discussed afterwards.

Enter the proposed strategies and select the one primary focus area addressed by the strategy. Because this is a 'first touch' tool, only note the most relevant focus area, understanding that in many cases a strategy will likely have impact in multiple focus areas.

Vet the proposed strategy against each of the criteria across the top of the matrix. A simple 'Y/N' vetting may be used, or a numeric system (such as 1= low, 5 = high) could be used for a more specific vetting process. Note any comments in the Notes field, and record if the strategy is approved or rejected for next steps (which could include a more in-depth cost analysis or other evaluation measures).

²³ Community and municipal priorities are called out as separate criteria in this matrix to acknowledge that over time, new priorities may emerge, and they may not always be the same between the community and the City.

²⁴ See footnote above.

²⁵ This means that the strategy will help staff monitor, report, and track energy data to measure progress against the baseline.

Implementation and Action Plan

This EE&CS also includes a template for a combined implementation and detailed action plan (Appendix 8). This template will be useful once the City has vetted, selected and approved strategies.

Implementation Plan

The first spreadsheet within the Excel workbook, the Implementation Plan template, provides a snapshot of all seven focus areas, with space for implementation categories, strategies, targets and indicators, timeline, leads, and budget information. Figure 12 provides a screenshot of this template. Since this report contains guidance on the selection process to stay in line with community and City goals and priorities, but does not include specific recommendations for strategies, the template is only pre-populated at the Focus Area level. The intent of this first sheet is to provide a high level overview and progress tracking mechanism for selected strategies across Focus Areas.

City of Ellensburg EE&CS Implementation Plan Template											
Focus Area	Implementation Category	Target(s)	Strategy	2012 Action	Who/Dept.	Cost & Funding	Due	Progress Indicators	Status Report /	Complete	
1. Transportation	A. Complete Streets		1. Open up cul de sacs for pedestrian walkways								
			2. Ex.								
			3. Ex.								
			4. Ex.								
			5. Ex.								
	B. Example			1. Ex.							
				2. Ex.							
				3. Ex.							
				4. Ex.							
				5. Ex.							
	C. Example			1. Ex.							
				2. Ex.							
				3. Ex.							
				4. Ex.							
				5. Ex.							
	D. Example			1. Ex.							
				2. Ex.							
				3. Ex.							
				4. Ex.							
				5. Ex.							

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General Transportation Notes:

Figure 12. Snapshot of Implementation Plan Template.

Action Plan

The next seven tabs within the workbook are placeholders for more detailed action items needed to move selected strategies forward in each of the seven focus areas. Figure 13 provides a screenshot of the Transportation Action Plan template. For more complex strategies, this tab may prove very useful to further assign and track roles and responsibilities, but may not be necessary for every strategy. The strategies automatically pre-populate from the Implementation Plan on the first spreadsheet tab.

1. Transportation		Detailed Action Plan		
Implementation Category	Action	Who	Milestone Dates	Complete
A. Complete Streets				
1. Open up cul de sacs for pedestrian walkways				
2. Ex.				
3. Ex.				
4. Ex.				
B. Example				
1. Ex.				

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Figure 13. Snapshot of Transportation Action Plan Template.

Setting Objectives

Timeline

The City has a good impetus for moving swiftly through the initial strategy selection and implementation process – the sooner efficiency and conservation efforts are in place, the greater the potential savings in energy, and the greater potential for avoiding Tier 2 pricing.

The matrix tool in this EE&CS is intended to help staff quickly assess potential strategies that align with the goals of the EE&CS, as well as capacity of the city staff to manage the effort required. It is important to recognize that opportunities can often arise with short decision horizons, such as grants furnishing significant funding or other resources. Furthermore, if a strategy is part of a larger grant process, the grant requirements will likely have a timeline and reporting milestone built in.

Other decisions may require more calculated deliberations, such as detailed cost-benefit analyses. An additional factor to consider is that the City budget cycle begins each August; therefore, strategies that will require funding or staff time should be vetted and ready for allocation approval prior to then.

Without the leadership of elected officials, it is difficult to create, and perhaps even more difficult to meaningfully maintain, forward-thinking policy regardless of the topic. In the case of the EE&CS, creative coordination by City elected officials and staff with the LDCU enabled funding and development of the Strategy. This is commendable. It is important, however, that the EE&CS stand alone as a unique policy document that has implications and impact beyond the code, and provides structure to the City and its community to develop non-regulatory programmatic strategies as well. It will be important that the document be regarded as a dynamic planning document that spans a broad spectrum of business, social, political, and environmental interests, and which can provide benefit over multiple administrations.

Performance or Prescriptive Target

Targets help gauge progress in matching implementation strategies to the EE&CS goals. Selecting targets should go hand in hand with selecting implementation strategies that support the larger goals. If implementation strategies are driven by a broader effort, such as a grant, targets may be already set and required. This may also be the case with efforts that are in alignment with broader efforts but are not directly tied to them.



With the exception of grassroots efforts, it will be the City's responsibility to select targets. Two common approaches are:

Performance Targets describe the desired outcome achieved, such as a reduction in building energy consumption by 10%, or an increase in bus frequency to every 15 minutes. The target success is based on actual results (was a 10% reduction achieved? Does the bus really show up every 15 minutes on a consistent basis?). Often, performance targets can be more difficult to track or measure, but offer a more solid measure of success.

Prescriptive Targets are more of a checklist of actions taken, with the intent that the actions will achieve a desired outcome, even though the outcome itself is not measured as recognition of success. For example, completing weatherization on all municipal buildings, or increasing the number of buses to provide greater frequency. Prescriptive targets may be useful for measuring success of factors that the City has direct control over, versus something that the City can only influence. While it might be easier to gauge progress on these targets, they do not take into consideration outside factors which might influence if the prescriptive pathways are achieving the intended results.

In many cases if an actual target is too challenging to select or commit to, a general direction can be a useful gauge in lieu of an actual target (ie. increase, decrease). Indicators (discussed below), are a useful tool in tracking trends as well as achieving prescriptive or performance targets.

Finally, for longer term or more aggressive targets, consider including incremental milestones along the way to help keep momentum going.

Measuring and Sharing Progress and Success

A best practice in translating goals from paper to reality is employing a “manage what you measure” approach to the implementation phase. Tracking progress serves multiple purposes, such as refining the strategies, correcting the current course, identifying resources needed and their availability, and uncovering additional opportunities. One of the most important benefits in measuring progress is that by acknowledging (and celebrating) achievements, including the short term milestones, the City can maintain and grow momentum as the longer term goals are pursued. Measurable outcomes also help to substantiate budget and staff time needed to support the effort over time.

Setting and tracking meaningful and measurable indicators

Indicators may evolve over time, but the earlier they are identified, the sooner they can be tracked against a baseline. Ideally, indicators should be considered at the same time that an implementation category or specific strategy is evaluated. Consider the qualities of sound indicators presented in Table 13.

Table 13. Criteria for Selecting Indicators

Relevancy	Make sure there is a connection to the goals or objectives of the strategy and the indicator results.
Consistently Measureable and Reliable Data	In order to track progress over time with the indicator, data sets need to be consistent, comparable, and from a trusted source.
Accessible	Ensure the effort required to collect, interpret and translate data matches staff or volunteer capacity.
Mix of leading and lagging indicators	Some indicators paint a picture of past progress, while others are more predictive for future outcomes.

It is important to recognize that not every single effort need be tracked – in many cases the burden of identifying and collecting data must be weighed against the value of quick implementation. Limits in staffing capacity are a common constraint in the process, and a very real issue to consider. In some cases, creative solutions such as community reporting (which may be less scientifically accurate, but still help to tell the story) are a possibility, and in other cases, it simply might not make sense to try and capture details. It is also helpful in this process to identify what data the City already has, such as municipal utility data, that can be applied to a wide range of potential indicators.

Baselines

Tracking the progress of an indicator means understanding the starting point to fully understand how a strategy has created impact. In terms of energy consumption and energy conservation efforts, the City has already compiled a good foundation of baseline data, as outlined earlier in this report. This baseline data will be useful in helping to benchmark overall progress resulting from a collection of strategies, and in some cases, such as specific efforts at individual buildings, can be used to measure more pointed EE&CS strategies. More specific baseline data may need to be identified and gathered for selected implementation strategies, however.

Sharing the Story

Sharing the story began well before the finalization of this document. The community pride in its Community Renewables Park, the level of participation in the survey and enthusiasm at public meetings is evidence of that.

The story doesn't end with the adoption of this EE&CS, or with the adoption of any one specific implementation measure. In order to keep with the intent of this as a living document, the enthusiasm for the project must be maintained. Sharing the stories of successes and challenges that follow the adoption and implementation is a key factor in maintaining momentum – for both the City and the community.

Stories can report on both the hard and soft successes of the effort. Those strategies with selected indicators will typically have metrics and data to substantiate the story, but may not be compelling in and of themselves. EPA's Green Communities program suggests the following tips for indicator reporting out:

- Tie the indicators to the goals and vision of the program
- Describe each indicator and why it is important
- Provide historical trends and anticipated changes
- Evaluate whether results progress towards or away from your program goals
- Discuss linkages to other indicators.²⁶

Sharing successes does not always need to mean reporting on numbers – sometimes a personal success story in the vein of a local business or homeowner who found success by tapping into the efforts of the strategy may go a lot further in generating enthusiasm and support. Numerous practical applications can be considered for crafting these stories with minimal effort through social media avenues, the existing website, and by tying into any existing community outreach events.

Outputs vs. Outcomes

In her book, *'Building an Emerald City – a guide to creating green building policies and programs'* Lucia Athens clarifies the difference between outputs and outcomes as follows: "Outputs are usually very specific and measureable program activities, such as the number of education sessions delivered, the number of publications released, or the number of customers assisted. Outputs, if properly chosen, are generally a proxy for the larger benefits that justify a program's reason for existence. They cannot in and of themselves show what is being accomplished."

For example, showing an output of how many brochures are distributed does not really show whether or not anything different happened as a result of this or whether anyone's behavior changed. However, outputs are very useful for indicating how program dollars and staff time are spent.... "Outcomes are the *impact* that results from outputs. They are often very difficult to measure. What happened as a result of the workshop or the green building assistance that was provided? Did the workshop attendees exhibit a change in their behavior or practice? ... The resulting *outcome* of these activities is represented by the amount of water or energy saved by the building or feature, for example. "

Making Numbers Memorable

"After a few zeros, numbers cease to be meaningful to most people. They know 1 trillion is more than 1 billion is more than 1 million. But the brain just registers 'big number.' To make matters worse, many units of measurement are foreign to people. How big is a megawatt or a Therm? What exactly is a metric ton of CO₂? To make people care about the numbers, you have to present them in ways that are meaningful in everyday life." ²⁷

²⁶ EPA Green Communities "Indicators" page: www.epa.gov/greenkit/indicator.htm

²⁷ "The Step-by-Step Guide to Sustainability Planning." By Darcy Hitchcock and Marsha Willard. 2008.

VII. Resources

Code and Regulatory Barriers to the Living Building Challenge for Sustainable, Affordable Residential Development. <https://ilbi.org/education/reports/SARD>

Energy Star Portfolio Manager

http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager

Meeting the 2030 Challenge through Building Codes

http://www.architecture2030.org/files/2030Challenge_Codes_WP.pdf

Walk Friendly Communities

<http://www.walkfriendly.org/index.cfm>

King County GreenTools Toolkit2: Roadmap to a Green Building Program

<http://your.kingcounty.gov/solidwaste/greenbuilding/documents/master-roadmap.pdf>

Community Energy Strategic Planning Academy (CESP)

http://www.nrel.gov/applying_technologies/state_local_activities/cesp_academy.html

VIII. Appendices

- 1. Community Survey Summary**
- 2. Community Workshop 1 Summary**
- 3. Community Workshop 2 Summary**
- 4. Stakeholder Interview List**
- 5. Municipal Energy Use Data Tables**
- 6. Gap Analysis of Ellensburg Codes and Policies**
- 7. Decision Matrix Template**
- 8. Implementation and Action Plan Template**