The Gunnison County Carbon Policy Task Force

Gunnison County
COLORADO

Final Report and Recommendations

Presented to the Gunnison Board of County Commissioners

To: Gunnison County Board of Commissioners

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January 7, 2011

Members of the County Board of Commissioners,

The Gunnison County Carbon Policy Task Force is pleased to present the attached Final Report and Recommendations for your consideration. Since its appointment in March, 2010, the task force has researched and deliberated a wide range of opportunities for decreasing the county's greenhouse gas (henceforth referred to as CO_{2E})[1] emissions and energy consumption.

The report begins with the mission, goals, and principles that we used to guide our work. These statements kept our group focused, avoiding straying into territory that, while important and interesting, was beyond the scope of the charge you gave us.

The heart of the report is in the section titled, "Recommendations." At your request, each recommendation includes explanatory language and, where appropriate, supporting information in a corresponding appendix.

The recommendations represent a consensus of the task force members; however, all members do not necessarily agree on all the particulars of all the recommendations. This is not surprising given the diversity of experience, expertise, and perspective that the members brought to the enterprise. We expect the Board and the community to respond to the recommendations with even more breadth.

We offer the following observations and suggestions to help you review the report and plan your next steps.

[1] Greenhouse gases trap heat in the atmosphere. The most abundant greenhouse gas is Carbon Dioxide (CO_2). Because their energy trapping effects are similar, other greenhouse gases are referred to as Carbon Dioxide Equivalents (CO_{2E}).

Reading the Report

- Each sector of recommendations should be viewed as a suite of measures that work in concert. The County should coordinate appropriate recommendations within each sector as they are considered for adoption.
- Each sector includes two types of recommendations: 1) policy or regulatory recommendations and 2) financial recommendations. The financial recommendations offer one or more revenue-related or financial incentive-based recommendations that the County can choose from to work in concert with the other recommendations in that sector.

Additional Implementation Steps

A former U.S. President famously said of a nuclear arms treaty with the USSR, "trust, but verify." The same principle applies to carbon policy and regulation: the only way to judge whether measures have been worth the time, effort, and money invested is to monitor both the county's total CO_{2E} emissions and the outcomes of each individual measure. We therefore suggest that you:

- Establish an ongoing, periodic system for monitoring energy use and CO_{2E} emissions in the sectors included in the 2005 greenhouse gas inventory.
- Monitor the effectiveness of particular measures adopted and implemented.
- Budget for dedicated staff time and/or a new staff position (i.e. sustainability coordinator) to coordinate energy policy, program implementation and data tracking in all sectors of County operations.
- Pursue the development of a County or regional energy authority to enhance local and regional energy production capacity and coordinate large-scale efficiency and sustainability efforts.
- Vet each recommendation and verify its cost-effectiveness prior to adopting and implementing it.
- Finally, because the science of climate change evolves over time, along with the economic, social, and political "climate," revisit, review, and revise the goals, principles, and recommendations at regular intervals.

In presenting our Final Report, we wish to thank you for the opportunity to serve on this panel. We have all learned from our participation and look forward to passing along our knowledge and conclusions. If our work succeeds, a vigorous, thoughtful, and respectful community discussion will ensue and sound decisions, backed by political will, will follow.

Climate change and the economics of energy will have profound effects on the economic, social, and environmental viability of our citizens, businesses and communities. Your timely response to these recommendations, is therefore, essential.

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INTRODUCTION

Who We Are

The Gunnison County Carbon Policy Task Force is a group of County residents appointed and assembled by the Gunnison County Board of County Commissioners (BOCC) to develop a policy framework and recommend specific regulatory changes and mechanisms to help achieve the County's reduction goals for carbon dioxide and its greenhouse gas equivalents (CO_{2E}).

Mission

To recommend policy and regulatory changes that promote efficient energy use, stimulate economic productivity through increased local production capacity and achieve the County's stated emissions reduction goals with the ultimate goal of improving the health and economic welfare of Gunnison County for all its residents and future generations.

Guiding Principles

Formulating and recommending policy on greenhouse gas emissions and energy consumption is a wide-ranging and complex task. To produce a viable result, the Task Force decided early on to guide and constrain itself through the following principles:

1. Policy recommendations are designed to be equitable and in proportion to the contribution of each sector to County emissions as a whole.
2. Recommendations address emissions by means of energy usage and are in the best interest of the health, safety and wellbeing of Gunnison County citizens.
3. The Task Force recommends that the County follow an incremental approach to implementation. Related recommendations in each category should be adopted and implemented in the order in which they appear.
4. The Task Force strives to produce recommendations that are economically feasible, socially acceptable and achieve significant CO_{2E} reduction targets.
5. Recommendations endeavor to fulfill a "triple bottom line," pursuing a balance of economic vitality, social justice and environmental quality.
6. Recommendations strive to have a neutral or positive effect on economic development.
7. The Task Force regularly considers, consults and includes constituencies potentially subject to the policy recommendations.
8. Whenever possible, the Task Force recommends incentives and disincentives. When this is not effective or feasible, regulations are considered.
9. The Task Force focuses on areas with the greatest chances of success in implementation and achieving reductions.
10. The Task Force defines carbon emissions as carbon dioxide and its greenhouse gas equivalents (CO_{2E}) resulting from the development and operation of a structure or project.
11. In accordance with the Colorado Sunshine Act (CRS 24-6-401) and the Open Meetings Law, the Task Force makes its work public by posting notices of meetings in the County Courthouse and by posting all Task Force documents online on a website open to the public.[2]

[2] https://sites.google.com/site/carbonpolicytaskforce/

Goals

1. Assist Gunnison County in implementing its Energy Action Plan[3] and reducing CO_{2E} emissions equitably across all sectors of the community and economy.
2. Improve efficiency of energy use equitably across all sectors of the community and economy.
3. Develop local and regional energy production and distribution capacity.
4. Improve and sustain economic viability by changing energy use patterns.
5. Educate residents about their relationship to energy use and CO_{2E} emissions.
6. Ensure the sustainable use and management of Gunnison County energy resources.
7. Preserve the environmental health of Gunnison County for its residents.

[3] Gunnison County Energy Action Plan, adopted Aug 4, 2009: http://www.gunnisoncounty.org/environmental_pdf/EAP_8-4-09.pdf

RECOMMENDATIONS

I. Buildings – New Construction

Relevant existing authorities: Gunnison County Land Use Regulation, County taxing authority

1a. Continually adopt the latest versions of the appropriate energy conservation code.

The County should create an internal procedure that allows for timely adoption of updates to the International Energy Conservation Code. Community Development staff should monitor proposed changes, analyze their efficacy for Gunnison County and be ready to propose Planning Commission review and County adoption as the changes are adopted by the international governing body

1b. Improve the performance outcomes of the code by amending the baseline code and supplementing it with a performance-based energy conservation worksheet.

Performance benchmarks should be based upon the total square footage of the building and performance standards should increase with square footage in a manner commensurate with increased impact[4]. The County Assessor's database should be amended to include performance rating of homes. Potential performance metrics may include projected consumption in kBtu/sf/yr or the US DOE Home Energy Score tool.

1c. Require a preliminary model of home energy use at the time of plan review to assure that the building's performance will achieve the standards established in Recommendation 1b.

Modeling building performance prior to the start of construction is a highly cost-effective mechanism to reduce building energy use. It also potentially avoids additional costs to the homeowner if the building fails to meet performance standards.

1d. Include an allowance for thick (i.e. high insulation factor) exterior walls in new construction[5].

Local municipalities have already adopted language in their building codes specifying that vent shafts, courtyards and any additional exterior wall thickness beyond six inches should be eliminated in the gross square foot calculations. The County should do likewise.

1e. Require an energy audit and a County-specified energy performance rating (e.g. Home Energy Rating System - HERS) at a building's final inspection.

While design and calculation can go a long way to assuring a new building's energy performance, and while on-site inspection during construction can help to ensure that the building is being constructed according to specification, building

[4] The Home Energy Rating System (HERS) is a current example of such a rating system.

[5] See also: "Additional Observations - Adoption of 2009 International Codes (Building, Energy, Fuel Gas, et al)," dated 10/25/2010, by Richard Karas, Vice Chair, Gunnison County Planning Commission, submitted as a minority report to the County Planning Commission's recommendations regarding adoption of amendments to the code.

inspectors tell us that not every detail can be checked and that a completed building that passed a plan-check energy audit may still fall short of its intended performance rating.

The only way to ensure that a completed building actually meets specification is to test it as built, including a blower-door test. The as-built energy audit can be conducted by a qualified third party and submitted by the building owner, thereby obviating the need for any additional County inspection staff.

Financial Recommendations

1f. Create residential, commercial and industrial versions of a Building Performance Mitigation Program (BPMP)[6] that:

i. Establishes progressive performance benchmarks based on square footage.

ii. Sets incremental fees and rebates for over- or under-performing the benchmarks.

(Refer to Appendix IV for an example Building Performance Mitigation Program.)

Buildings that achieve the performance benchmarks based on their square footage will pay no additional permit fee. For buildings that fail to meet the performance benchmark the permit fee will be adjusted depending on the overage. The County should seek to establish incentives for outperforming the standard (e.g. expedited permit process, prioritization or rebates if resources are available, etc.).

The funds generated from the BPMP will be deposited in a segregated, interest-bearing County investment fund supporting County-wide energy consumption management, and, indirectly, CO_{2E} emissions reduction.

Uses of BPMP-generated revenues should be carefully specified in the County resolution establishing the program. For example, the BPMP fund might be specified to fund activities and projects such as:

- Sustainable design, green design and construction education programs for citizens and the design and construction community
- Community-scale renewable energy systems
- Source of capital for “Energy Smart” loan programs to assist owners in undertaking energy conservation retrofits
- Energy consulting and modeling services provided by local individuals and companies
- Contracting with third parties (e.g. the Office for Resource Efficiency [ORE] and Western State College [WSC]) to provide education and certification in green building and cold climate building science for local builders, architects and owners

[6] The creation of a nexus study should occur prior to instituting BPMP fees demonstrating a relationship between the fees and the new construction in terms of building performance, energy usage and/or emissions.

1g. Encourage the education, certification and hiring of contractors qualified in green building and building science by exploring the feasibility of the following:

- Provide education in green building techniques and cold climate building science in collaboration with ORE and WSC.
- Include the following language on building permit applications, “Are you familiar with building practices that promote energy conservation? Is your contractor? It’s a good idea to discuss this with your contractor.”
- Educate homeowners about the importance of cold climate building science prior to purchasing a building permit.
- Develop or adopt a professional education, training and certification program for contractors.
- Host an annual County-wide competition for the most energy efficient home, building or remodel. The testing shall be by a uniform energy rating system on all structures entering the competition. The Gunnison County Planning Office and the County Building Department shall select the rating system. The contractor, designer or owner of the structure shall pay for the testing of the structure. The prize should be a certificate of recognition from Gunnison County, presented during a Board of County Commissioners’ meeting.

II. Buildings – Existing

Relevant existing authorities: Gunnison County Land Use Regulation, County taxing authority

2a. Adopt energy standards for remodeling existing buildings.

The 2005 Upper Gunnison River Watershed (UGRW) Emissions Inventory identified space heating of existing buildings as one of the most promising sectors for reducing energy consumption, realized cost savings, economic development and CO_{2E} emissions reductions.

An existing building undergoing a significant renovation presents an opportunity for future energy and operating cost savings. Exposed walls and ceilings during renovation provide a window of opportunity to add insulation and then seal against outside air infiltration as they are reclosed. We therefore recommend establishing energy standards to be met as part of the construction permit process. The standards should be based on accepted best practices as seen in other jurisdictions and should improve the efficiency of remodels with regard to building envelope as well as appliance and mechanical systems. The National Association of Home Builders’ Green Building Standard (ANSI 700) is tailored to accommodate remodeling projects. (See Appendix V for examples).

2b. Develop and support regulation of residential and commercial remodeling, including technical support and financing options.

Remodeling, retrofit and weatherization need to be attractive options for building owners. In November 2009, voters approved the financial mechanism necessary to establish an Energy Smart property-assessed clean energy loan program to aid homeowners in financing retrofits and weatherization. In spite of roadblocks erected by the federal government, an alternative Energy Smart loan program's first phase is nearing implementation. To make the program even more attractive and effective, it should include baseline building energy consumption data from comprehensive building energy audits (i.e. blower-door and mechanical testing) and historical utility bill data. The program should provide property owners with: information about their energy use, steps to take to reduce energy consumption, financing options for the various recommended measures and follow-up information about the impact and effectiveness of various efficiency measures taken.

2c. Use the marketplace to make energy efficiency a competitive advantage in attracting tenants.

i. Support a renters' education campaign about energy efficiency and utility bills to help them make informed decisions about the properties they are considering renting.

While there are few options for encouraging landlords to make existing rental properties efficient, other than those noted in Recommendation 2d, the marketplace may offer the best incentive for landlords to improve the efficiency of their rental units. The County Housing Authority is positioned to improve knowledge of this issue. It should research methods and design programming to increase competition among rental property owners to attract tenants with improved efficiency and lower overall utility costs.

ii. Educate landlords to market the efficiency of their properties.

To be successful, the marketplace campaign must educate both tenants and landlords. Landlords should be educated in ascertaining what improvements need to be done (perhaps incentivized via free or reduced-cost energy audits), finding qualified contractors, obtaining low-cost financing (see Recommendation 2d), and advertising their upgraded units (e.g., prominently displaying their HERS ratings or Home Energy Score). This is a task for which the Housing Authority partnering with a third party such as ORE or a green builders' guild would be well suited.

Financial Recommendations

2d. Establish incentives (e.g., rebates, low-cost loans) to encourage landlords to meet efficiency standards.

The Energy Smart program is directed at homeowners; however, the rental sector provides housing for a large portion of County residents. Currently, there are few options for encouraging energy efficiency in rental housing since most landlords simply pass along utility bills to their tenants. Two options, however, appear feasible: (i) tailor the Energy Smart program to maximize participation of rental properties; and (ii) provide rebates for rental properties which meet the efficiency standards developed under Recommendation 2a.

III. Buildings – Subdivisions

Relevant existing authorities: Gunnison County Land Use Resolution, County taxing authority

3a. Amend the Land Use Resolution (LUR) to include a comprehensive energy, waste and transportation policy for new, large subdivisions.

Subdivisions can significantly increase County energy consumption and CO_{2E} emissions if their plans do not address transportation, waste, building siting and orientation, and energy importation or production. Moreover, subdivisions in outlying areas place a strain on County infrastructure and resources in addition to increasing CO_{2E} emissions due to their distance from services. Placing more stringent requirements on the location of future development can therefore reduce impacts to the County and reduce CO_{2E} emissions.

At present, the Gunnison County LUR does not explicitly consider the energy and CO_{2E} impact of proposed new subdivisions. One standard, Standard 10.102, indirectly addresses energy use by encouraging placement of new subdivisions near existing population centers.

Land use regulations for subdivisions should explicitly include quantitative criteria for energy consumption and CO_{2E} emissions, including not only on-site impacts, but also impacts on County infrastructure and services. Land use regulations should also require monitoring of energy consumption with commensurate development improvement agreements.

Approval criteria for proposed major impact subdivisions might take the form of a point system, a rating system and/or prescriptive regulations[7]. For example, under a point or rating system, a subdivision would be able to obtain points or a favorable rating if the elements listed below were incorporated into its covenants as requirements or developed as part of the subdivision's initial infrastructure.

Recommended elements to be included in subdivision approval criteria (point or rating system, or prescriptive requirements) include, but are not limited to:

- On-site renewable energy generation and distribution
- Documented high performance building design and construction
- Site design: street scope, density, trees, and solar access and orientation
- Distributed, small-scale renewable energy generation

[7] For example, see Appendix VI, *LEED 2009 Neighborhood Development Scorecard.*

- Waste management options at the subdivision including centralized composting and recycling facilities
- Comprehensive water management: indoor water use, water-efficient landscaping, water metering, site-wide water access, treatment and management
- Public transportation options between the subdivision and existing population centers and other measures to reduce automobile dependence such as trail systems and bike routes to transportation hubs
- Community gardening
- Compact development

3b. A transportation impact mitigation plan should be required for each new major impact subdivision, and should be coordinated with the County Transportation Master Plan to ensure that the proposed development adds to County transportation infrastructure and capacity to offset the impacts of the development and help meet future demand in the County. (See Recommendation 4a).

New subdivisions have a cumulative impact on the County's transportation infrastructure – a problem with which the Planning and Zoning Commission and the Public Works Department are already dealing. The problem manifests itself when an intersection or road serving multiple subdivisions receives sufficient volumes of travel that its service level is degraded – a relatively rare occurrence to date, but perhaps less rare in the future.

Degraded service levels on public-access roads and intersections result in increased idling and stop-and-go acceleration/deceleration, both of which greatly decrease gas mileage.

County staff have suggested mechanisms by which new development can be assessed for their cumulative impact on the County's transportation infrastructure. We recommend that the Planning Commission give immediate attention to evaluating potential mechanisms and incorporating them into the LUR.

Financial Recommendations – Development Improvement Agreements

IV. Transportation

Relevant existing authorities: Gunnison County Land Use Resolution, Gunnison County Special Development Project Resolution, Gunnison County Road and Bridge Standards, County taxing authority

4a. Develop and adopt a comprehensive transportation master plan to coordinate community development and transportation planning.

The objectives of the transportation master plan should include:

i. Providing for convenient, timely, and ubiquitous passenger travel and timely, efficient transport of commercial goods and services throughout the County.

ii. Decreasing the expenditure of energy needed to achieve 4ai, above.

iii. Supporting a County-sponsored carpooling program by providing infrastructure (e.g. an online forum) or incentives.

The plan should assess the impacts of potential population and commercial development on demand and infrastructure and determine how public and private transportation should respond in order to avoid or minimize additional energy consumption. Possible responses include:

- Bus stops connecting new development to existing bus routes
- Additional buses or similar public transportation equipment
- Park and Ride facilities and bicycle hitching posts
- Bike lanes and similar alternative transportation infrastructure connecting the development to existing transportation routes

Finally, the plan should identify future transportation demand and infrastructure needs, which will, in turn, necessitate specifying where population and economic development will be directed. Infrastructure planning should be coordinated with neighboring counties and municipalities and include bus and/or rail services and might include formation of regional transportation authorities.

4b. Establish energy conservation standards and increase intermodal capacity in road upgrades and new road construction.

New, publicly dedicated roads should be required to provide physically separated lanes for bicycle traffic. Long-term County transportation planning and upgrades should be coordinated with the County Transportation Master Plan (see Recommendation 4a) and should be developed with efficiency and shared uses in mind.

4c. Amend the existing LUR and Special Development Project Regulations (SDPR) requirements for a Transportation Impact Study for new developments to include a Transportation Demand Management Plan.

The Transportation Demand Management Plan should detail routes for alternative modes of transportation and specify any necessary infrastructure improvements or additions needed to facilitate public and alternative modes of transportation. This plan should be based on the same objectives as noted in Recommendation 4a, above, and be coordinated with the County Transportation Master Plan.

4d. Implement a public education and advertising campaign to increase use of public transportation.

Promote the benefits of public transportation (e.g. cost savings, emissions reduction, etc.) and the information necessary for citizens to take advantage of it (e.g. schedule, fares, etc.). This messaging can be included on the County website and in County buildings and departments. (See recommendations 9a and 9c, which can be applied to transportation).

4e. Include in public education the impact on air quality and public health of prolonged and unnecessary idling of vehicles and equipment, as well as the waste of expensive fuel.

This messaging can be included on the County website and in County buildings and departments.

Legislation (an "idling law") should be considered despite the difficulty of enforcement (definition of "prolonged", etc.).

Financial Recommendations

4f. Increase County budget for improvements to and maintenance of public transportation infrastructure such as:

- Bicycle lanes
- Ride sharing and carpooling
- Cargo-pooling
- Increased bus service
- Regional transportation coordination
- Incentives to encourage development of housing capacity located in close proximity to job and population centers

4g. Submit to the voters a ballot measure instituting an energy consumption fee on motor fuels, the proceeds of which would be placed in a dedicated, interest-bearing account for transportation infrastructure and initiatives such as those cited in Recommendation 4f, above.

According to the *2005 Upper Gunnison River Watershed Greenhouse Gas Emissions Inventory*[8], transportation sources contribute nearly 60% of the County's CO_{2E} emissions. Unless transportation-related emissions are reduced, it will probably be impossible to achieve a reduction in the County's overall CO_{2E} emissions.

If the County's residents do want to achieve a reduction in these emissions, then they may wish to consider reducing their vehicle use. A self-imposed motor fuel fee could invest revenues in local transportation amenities such as those cited in Recommendation 4f to make this easier and, if successful, a per-gallon motor fuel fee might help to keep dollars in the valley, reduce dependence on oil corporations and foreign oil producers, and reduce CO_{2E} emissions. Because of its central contribution to the economics of the valley and its minor contribution to the County's CO_{2E} footprint, agricultural use of motor fuels ought to be exempted from such a fee.

4h. Incentivize the purchase of new cars achieving a certain threshold of fuel efficiency via rebates or waived/reduced fees.

In addition to encouraging the use of shared transportation to bring down fuel consumption, the County can encourage citizens to operate high efficiency vehicles. Fees on existing vehicles would not change; however, newly purchased vehicles with higher efficiency than a County-determined threshold would be

[8] Appendix III

eligible for rebates or reduced fees, and those with poorer efficiency than the threshold would be assessed a modest, annual fee. The threshold should exceed current CAFÉ standards by 10%.

V. Special Development Projects (SDPs)

Relevant existing authorities: Special Development Project Regulations (SDPR) (See Appendix IV)

The Special Development Project Resolution (SDPR) regulates impacts – immediate and long-term, individual and cumulative, and on- and off-site – caused by large projects. These projects may consume large quantities of energy and may therefore contribute significantly to the County's total emissions of CO_{2E}[9]. At present, the SDPR does not address this impact. We therefore recommend the following amendments and additions to the SDPR:

5a. The application for a SDP permit from Gunnison County shall include projection and analysis of the project's energy impact:

i. Annual energy consumption projection during its construction and operation phases.

ii. Identification and analysis of energy source options for the project during its construction and operation phases, together with a rationale for the sources selected. Potential sources of energy within Gunnison County must be considered.

iii. A plan for annually assessing the project's energy consumption during construction and operation.

iv. A projection of new energy transmission infrastructure that will be required by the project.

5b. Require SDPs to minimize CO_{2E} emissions and energy use by requiring applicants to designate a set of best energy practices to be used during their construction and operation phases. These best energy practices must be based on accepted science and industry standards.

The concept of "best energy practices" is analogous to the "best management practices" required by state and federal agencies in areas such as stormwater management. This means that the project will employ technology and practices that do not merely reduce energy consumption; rather it means that they will use technology and practices that minimize it.

The proposal should be reviewed by County staff to ensure compliance with these regulations prior to being considered by the Planning Commission. As with other provisions of the SDPR, the applicant will bear the burden of proof in demonstrating that it has met the best practices requirement, and the County may employ outside consultants, at the applicants expense, to evaluate relevant portions of the application.

[9] For example, GCEA and a representative from the Mount Emmons Mining Company have indicated that the Mount Emmons Project could double Gunnison County's electrical energy consumption.

5c. Require periodic audits of the project, at the project's expense, based upon the consumption projections and monitoring plan approved in the project application, to ascertain whether:

i. The designated set of "best energy practices" has been implemented and maintained, and

ii. The actual energy consumption is consistent with projections.

By "closing the loop" via audits and monitoring, the County can determine if the project's performance is consistent with what was projected. If there is a discrepancy, then the County has a sound basis for amending the conditions of approval, seeking additional mitigation, seeking damages, or issuing stop-work orders.

Financial Recommendations

The task force was unable to reach consensus regarding financial recommendations for Special Development Projects. We therefore present two alternative recommendations for the Board's consideration.

5d. Require SDPs to mitigate their energy consumption in an amount consistent with the County's most current CO_{2E} emissions reduction goals.

At the time this report is being written, the County's goal is to reduce overall CO_{2E} emissions to a level 20% less than the amount accounted for in the 2005 county emissions inventory. If this recommendation is adopted, any new special development project would be required to mitigate its CO_{2E} emissions sufficiently that the county's overall emissions would still meet the stated goal.

Mitigation may be achieved by, but is not limited to:

- In-county energy offsets funded directly by the project
- On- or off-site alternative energy production
- Energy efficiency measures
- Carbon capture and sequestration (CCS) and other forms of CO_{2E} reductions
- Contribution to a Gunnison County energy consumption reduction program[10]

OR

5e. **Require projects that create significant new demand on energy infrastructure to create an escrow account proportional to the impact of increased demand, assessed on actual operations.**

These funds would be held and invested by the County. The project could reclaim portions of the escrow account, together with a portion of earned interest, through demonstrated efficiency improvements and/or local generation capacity resulting in a net CO_{2E} reduction. A portion of interest earnings will be used by the County for local energy programs and projects.

[10] See Appendix VI for an example suggesting how such a program might be structured.

VI. Local Energy Production

Relevant existing authorities: GCEA & City of Gunnison Electric's contracts with suppliers

6a. Where deemed appropriate by the BOCC, advocate for and help facilitate environmentally, socially and economically feasible renewable energy projects in the County.

The determination of appropriateness should include long-term cumulative impacts of the proposed projects.

Current projects under investigation include: Waunita Geothermal Project, Coal Mine Methane Capture project, and Taylor River Hydro project. Each of these has the potential to supply a major portion of the County's energy needs, and each also has significant potential social, environmental and economic impacts. County staff and the County Commissioners have done a good job of responding to these proposals, but it may be necessary to provide additional staff resources in order to keep up with the additional workload that these and pending projects may impose.

6b. Maintain awareness of potential renewable energy projects and continually seek ways in which the County can assist in their implementation (e.g. land, funding, permitting, other resources, etc.).

The County should establish procedures and/or designate a point person to identify possible renewable energy projects. The County should review potential projects during annual strategic planning and budgeting sessions and determine if and how the County might facilitate the development of projects.

6c. The County should identify County-owned assets (e.g. land, rooftops, etc.) for potential designation towards community energy projects.

Gunnison County owns assets that could be used to either produce renewable energy and/or reduce dependence on non-renewable energy sources. For example, the rooftops of county buildings could be used for solar photovoltaic energy production or solar hot water heating. County-owned land, especially land close to population centers, could be set aside for community gardening.

Determining whether using County-owned assets in this way would be cost- and CO_{2E}-effective requires that the County inventory the assets that might be used as sites for community energy projects. Once these are identified, potential projects can be ranked on the basis of feasibility, cost, efficacy, and potential for funding (especially grant funding).

6d. Advocate for or require coal mines to capture the methane released from their operations and harness it to produce power.

Methane capture and electricity generation is now economically feasible and attractive, since dual leasing requirements have been abolished and the mine can have exclusive rights to its own capture and generation project.

Financial Recommendations

6e. Promote the use of small-scale, on-site, and locally-distributed renewable energy generation to residents and businesses through incentives, property

tax incentives, rebates, tax credits, fast-track processes for permits and easements or other mechanisms.

As the local population and economy grow, avoiding the energy and financial cost of constructing and operating additional transmission infrastructure can save money, energy, and CO_{2E} emissions. Distributed energy production can reduce transmission losses and save infrastructure costs, including the energy used to construct infrastructure. In some instances, local production can reduce peak loads, decreasing utility rates. Moreover, whereas remote large-scale energy production (mostly non-renewable, and therefore a heavy CO_{2E} emitter) drains money from the local economy, local energy production can keep dollars in the Valley and thereby grow the local economy and create jobs[11].

We recommend that the County collaborate with local distributors, such as the Gunnison County Electric Association (GCEA) and Atmos Energy, the municipalities and large-scale energy producers, such as Tri-State Generation and Transmission Association and Municipal Energy Agency of Nebraska (MEAN), to make it feasible to increase distributed, local energy production. This may include regulatory reform and require advocacy directed toward new pricing structures.

6f. Incentivize commercial and industrial-scale renewable energy production through incentives, property tax incentives, rebates, tax credits, fast-track processes for permits and easements or other mechanisms.

The same rationale advanced in Recommendation 6e, above, applies to commercial- and industrial-scale enterprises.

6g. Incentivize agricultural renewable energy production (e.g. solar watering pumps) through incentives, rebates, tax credits, fast-track processes for permits or other mechanisms.

The same rationale advanced in Recommendation 6e, above, applies to commercial- and industrial-scale enterprises.

6h. Submit to the voters a ballot measure instituting a carbon tax on energy purchased from utilities, the proceeds of which would be placed in a segregated, interest-bearing account for the purpose of transportation demand management, residential and commercial energy retrofitting, and local, renewable energy production and transmission infrastructure.

Perhaps the most direct means of funding energy conservation programs and encouraging individuals and businesses to conserve energy is to directly and consistently tie energy consumption and energy cost via fees or taxes on utility consumption. Other cities have successfully taken this step, with voter approval[12].

We believe that pursuing a modest carbon tax on utilities is preferable to pursuing a linkage fee. First and foremost, such a course obeys the will of the voters.

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[11] See, for example: Radloff and Turnquist, "How Could Small Scale Distributed Energy Benefit Wisconsin Agriculture and Rural Communities?"; http://www.pats.wisc.edu/pubs/pdf.ashx?pubsID=97

[12] See, for example: Brouillard and Van Pelt; "*A Community Takes Charge: Boulder's Carbon Tax*"; http://www.bouldercolorado.gov/files/Environmental%20Affairs/climate%20and%20energy/boulders_carbon_tax.pdf; February 2007

Second, adopting a self-imposed tax incurs fewer statutory obstacles (for example, the nexus requirements are less onerous).

To gain approval from the voters, a carbon tax on utilities needs to provide clear benefits in return. This would hinge on the projects and activities funded by its revenues. A clear plan of action, carefully laying these out, must be developed before a vote is contemplated.

VII. Energy Generation and Distribution

Relevant existing authorities: GCEA's and City of Gunnison Electric's contracts with suppliers

7a. Advocate for energy suppliers to conduct resource planning in a manner consistent with the goals of the Colorado Climate Action Plan in order to facilitate the achievement of Gunnison County's similar targets.

The County should weigh in when appropriate (e.g. during resource planning sessions or public comment periods) to request that plans account for increases in the cost of carbon and that they consider state and local governmental reduction goals for CO_{2E}.

Gunnison County's Energy Action Plan seeks to reduce CO_{2E} emissions 20% by 2020, as does the Colorado Climate Action Plan (CCAP). Because much of the County's CO_{2E} footprint is attributed to energy generation, achieving this goal will only be possible if the County's energy providers conduct planning for energy generation with similar reduction targets. Specifically, the County's goals would be more attainable if the utilities serving the County planned for resources in a way that their emissions reduction targets matched those of the Colorado CAP.

Resource planning is a utility planning process where the costs and benefits of both demand- and supply-side resources are evaluated to develop the ideal mix of resource options. Traditionally, this means the least-total-cost, but in some cases, it includes a means for considering environmental impacts caused by energy supply/transmission and for identifying cost-effective energy efficiency and renewable energy alternatives. Planning for resources in a way that accounts for potential increases in the price of CO_{2E} emissions would allow local utilities to hedge the risks of extraordinary electricity costs if and when a price on carbon is established. A hedging strategy would protect residents and businesses against utility cost increases that would be especially dramatic for customers of a predominantly coal-based utility.

Utilities will sometimes also incorporate a public participation component into their resource planning processes, as was the case with Tri-State in 2010. Given these opportunities, the County should express its views; urging utilities to pursue a diverse energy portfolio and thereby helping to insulate their customers from the impacts of CO_{2E} pricing.

7b. The County should remain apprised of the actions and policies of its local utilities by requesting quarterly updates from their representatives.

Local utilities like the GCEA have significant influence and impact on many aspects of the recommendations contained in this document. For example, they

can be the local link to long term resource planning, the entity with the ability to distribute locally produced renewable energy, the clearinghouse for information on home energy efficiency programs and technology and the link to federal or state rebates for home energy efficiency upgrades. Local utilities also have influence over state and federal policy, policy that may work in favor or against the County's established CO_{2E} reduction goals.

Currently, there is a lack of communication between the County and local utilities regarding these and other relevant issues. While we are not recommending that the County seek to impose any type of regulatory oversight over local utilities, we expect that improved awareness and communication between the County and the utilities could lead to improved opportunities to collaboratively achieve goals that revolve around the best interest of citizens and help facilitate established CO_{2E} reduction targets. By reaching out to local energy providers and requesting quarterly updates, the County would be able to determine whether opportunities for collaboration or exchanges of information exist that might otherwise be lost or undiscovered.

Financial Recommendations

7c. Advocate for GCEA and the City of Gunnison Electric to adopt a tiered rate structure according to usage with incentives for conservation and non-peak time of use.

Assist GCEA in their effort to reduce peak demand in the County. This may be achieved through pilot programs (e.g. installation of smart meters that record hourly energy consumption), coordinated public education campaigns, outreach to large-scale electricity users and changes to County policy with regard to energy use in County facilities.

VIII. Waste

Relevant existing authorities: Gunnison County Landfill, municipal waste contracts

Facilitate and participate in actions that divert and reduce waste streams and seek opportunities for reuse, recycling and waste-to-energy generation.

Gunnison County currently offers limited public facilities and services for recycling; the private waste collection disposal services, such as Waste Management, also do so. In addition, commercial businesses and organizations such as Six Points offer residents opportunities for reusing clothing, utensils and other necessities of life. The fact remains that most waste material goes to the County Landfill.

Reducing the waste going into the landfill by encouraging reuse, recycling and waste-to-energy provides an excellent opportunity to save energy, keep dollars in the Valley, develop additional employment, and reduce CO_{2E} emissions. The following are examples of opportunities for County action:

8a. Pay-as-you-throw rate structures:
The County landfill and the private companies that collect and dispose of waste already use a pay-as-you-throw rate structure (loosely based on the volume of waste material and the type of waste material). These rate structures, since they are based on volume, rather than weight, may not accurately reflect the amount of

CO_{2E} gases they produce as waste decomposes. The County should determine whether it is feasible to weigh waste (i.e. weighing the vehicle before and after dumping) and charge accordingly.

8b. Increased scope of recyclable materials:

Implement a system to allow disposal of comingled recycling at the County landfill. Although some of the County's commercial waste collection companies do collect recyclables, many County residents must separate their recyclable materials, and make a trip to the nearest recycling center – a considerable inconvenience, and one that encourages disposal of those materials in the landfill. Many communities across the nation have instituted programs allowing residents to commingle recyclables and to separately comingle their compostable materials. Recycling center staff then separates materials at the facility. Experience has shown that such programs can increase the amount of material collected by 20-30%.
We recommend that the County, working in collaboration with the municipalities, establish collection and drop-off facilities at both ends of the valley to collect recycled materials to be disposed of locally. This would expand the coverage of recycling pick-up locations in the County.

The County should also seek out ways to accept more products, particularly those generated as waste products during construction and renovation projects, such as aluminum sheeting, copper, steel, etc..

8c. Recycling of construction materials on demolition and construction sites:

i. Amend the LUR to require recycling of construction materials, containers, parts and assemblies.

ii. Allow reuse of recyclable materials (e.g. building materials, furniture, etc.) left at the County landfill.

A significant amount of waste construction materials, containers, parts and assemblies generated by construction end up in the landfill or disposed of by burning. Current rules do not permit people to "treasure hunt" for reusable materials at the landfill, so what is left there stays, even if it can be economically recycled or reused.

To make recycling both convenient and economically attractive for builders and the public in general, we additionally recommend these steps:

iii. Create or facilitate the development of a construction, building and mechanical materials reuse center where contractors can consign and the public and other contractors can purchase quality used materials that would otherwise be thrown away.

iv. Improve and increase the frequency of electronics and hazardous materials recycling opportunities at both ends of the valley.

v. Institute surcharges for disposing of household and commercially recyclable products and materials at the landfill.

8d. Create a community compost/mulch production facility:

Provide lands and facilities for a large-scale compost and mulch facility. Revise the tip fee structure to encourage the dumping of clean wood and food waste material that can be used in the production of organic compost and mulch.

Much of the material buried at the County landfill simply rots and produces methane, a powerful greenhouse gas, as well as oxides of nitrogen. If done properly, however, normal household waste can be composted to produce mulch that can increase sequestration of CO_{2E} when it is added to depleted soils. It should be noted that composting itself produces methane (CH_4) and nitrogen oxides (NO_X), but some studies[13] have shown that the net beneficial effect of sequestration is greater than the negative effect of the composting-produced CH_4 and NO_X).

Some communities have begun curbside collection of household compostable materials[14]. By providing a local composting and mulching facility and revising tipping fees, the County can not only attract residents' disposal of compostables, but perhaps also gain the business of commercial waste collectors who currently transport and dispose of local compostable materials at sites in other counties.

8e. Modern waste-to-energy technology (e.g. plasma arc, pyrolysis, etc.): A large fraction of the waste that goes into the County landfill eventually decomposes, forming methane gas that eventually enters into the atmosphere. Methane is far more effective in trapping heat than is carbon dioxide. Thus, disposing of organic materials by converting them to CO_2 would be preferable to the present method. This is a process that simultaneously produces energy (electricity and/or process heat) and reduces the volume of waste needing burial. Fortunately, there are several technologies[15] now in use that appear feasible for Gunnison County, even considering the County's relatively small population and modest commercial/industrial sector.

The capital requirements for a waste-to-energy facility are considerable and probably inappropriate for County investment; however, the County can and should identify potential waste-to-energy companies, assist them in obtaining local, state and federal permits, and facilitate partnerships between producers and energy consumers (e.g. GCEA, the City of Gunnison, WSC, new projects subject to the SDPR, etc.).

IX. Education & Collaboration

Potential existing partners: Office of Resource Efficiency, Gunnison Watershed RE1J School District, Western State College, CSU Extension Office, local service clubs and organizations

Progress in all of the other energy- and climate-related areas covered in this report depends on an informed citizenry, one that spans not only the present adult population, but also many future ones. Informed citizens can forge the will to deliberate potential policies and regulations, elect leaders who make wise decisions and choose to participate in opt-in energy programs and opportunities. It is no surprise that all of the

[13] See, for example: Andersen JK, Boldrin A, Christensen TH, Scheutz C.; Greenhouse gas emissions from home composting of organic household waste; http://www.ncbi.nlm.nih.gov/pubmed/20674324; July 31, 2010

[14] See, for example: City of Santa Rosa Compost Facility: http://ci.santa-rosa.ca.us/departments/utilities/Projects/BMS/Compost/Pages/CompostFacility.aspx

[15] http://en.wikipedia.org/wiki/Waste-to-energy, http://en.wikipedia.org/wiki/Plasma_arc_waste_disposal

municipal energy action plans, as well as the County energy action plan, made energy and climate education a high priority. The measures recommended below are in varying stages of implementation and would all greatly benefit from additional support.

9a. Foster existing efforts to promote energy efficiency and renewable energy systems by supporting the organizations undertaking them.

Support might take the form of public recognition, expressions of encouragement, financial contribution, in-kind contribution, promotion (e.g. links on the County website) and formation of partnerships to offer events or programs. For example, the County could designate a day, month or other period of time as “Energy Awareness Day” and call on relevant organizations to publicize the day appropriately.

Support WSC, especially the Institute for Applied Sustainability, in providing educational opportunities to the public on different applications of energy efficiency and renewable energy.

Support ORE in providing an Energy Resource Center and on-demand information and outreach to the public about existing programs and resources.

9b. Participate in existing local and regional energy stakeholder groups. The County should actively participate in the regional energy planning efforts coordinated by ORE.

Continue to collaborate with other regional entities through participation/representation in any convened groups or committees on energy. Investigate opportunities for partnership with other entities in coordinating outreach and educational efforts.

9c. Offer free energy-related informational materials in appropriate departments and ensure their employees are well-versed in the materials. For example, the County could stock the following departments as described:

- Department of Health and Human Services: materials on weatherization, DIY home energy upgrades and financial incentives
- Multi-Cultural Resources Center: materials on weatherization, DIY home energy upgrades and financial incentives in the Spanish language
- Housing Authority: materials on weatherization, DIY home energy upgrades and materials targeted at renters
- Building Permit Office: materials on energy efficient construction & contractors, energy retrofits and renewable energy systems
- Department of Motor Vehicles: materials on fuel-efficient vehicles, MPG-improving driving practices and public transportation

9d. Coordinate with the local school district to create K-12 educational programming.

Programming should be designed to teach students about energy consumption and efficiency, environmental impacts and practical steps to reduce their energy use. These efforts could be coordinated with WSC and ORE to maximize their scope and effectiveness.

For example, the County could send employees (e.g. members of the Green Team) to classrooms – in the spirit of a D.A.R.E. presentation from a police officer – to discuss in simple terms what the County is doing and what the student might do to conserve energy in their home.

9e. Support educational opportunities for property owners managing significant amounts of land (e.g. farms, ranches, equestrian land use, large gardens, etc.) on land and soil management practices optimal for increasing carbon capture and sequestration (CCS).

Upon release of the USDA-CSU (US Department of Agriculture-Colorado State University) Agricultural Carbon Footprint Calculator, promote and offer trainings on this tool. These efforts should be coordinated with and utilize the resources of the National Resource Conservation Service (NRCS), CSU Extension Office, WSC and other relevant entities.

Financial Recommendations

9g. Allocate portions of implemented revenue sources to the educational initiatives described above.

This report outlines several carrot and stick mechanisms for reducing energy use and CO_{2E} under the "Financial Recommendations" sub-section of each section. Some of these, if implemented, would generate revenue streams. The County should ensure it directs a portion of any implemented revenue stream to educational efforts executed by the County and/or the organizations referenced above in this section.

X. Agriculture

Relevant Existing Authorities: Gunnison County Land Use Resolution

According to the UGRW CO_{2E} Emissions Inventory, agriculture contributes a small part of Gunnison County's CO_{2E} emissions. The Inventory did not take into account carbon capture and sequestration (CCS) in soils, which may offset some of the inventoried emissions, particularly because some of the ranching community already actively engages in "best practices" aimed at increasing the means of capturing atmospheric CO_2 in the soil.

The Task Force determined that agricultural buildings and transportation did not present significant opportunities for cost-effective initiatives or CO_{2E} reductions. Therefore, this report offers no recommendations for these sub-sectors of agriculture.

10a. Support research and development of carbon levels and CCS in different types of local soils to develop baseline levels and documented, tested techniques for optimizing CCS[16].

CCS may be the most significant and cost-effective way for the agricultural sector to help achieve the County's objectives. The effectiveness of CCS depends heavily on characteristics such as soil composition, vegetation, topography and surface and subsurface water, all of which vary widely throughout the County.

[16] See, for example: U.S. E.P.A. Greenhouse Gas Reduction through Agricultural Carbon Enhancement Network (GRACENET); http://www.ars.usda.gov/research/programs/programs.htm?np_code=204&docid=17271

Before activities to foster enhanced CCS can begin, a great deal of research must be done to better understand these characteristics for individual parcels of local agricultural land. Once the best potential acreage for increasing CCS is identified and the best localized methods for increasing CCS are determined, the County may consider additional activities to encourage implementation.

Financial Recommendations

10b. Support CSU Extension's education programs for farmers and ranchers about the benefits and costs of techniques that maximize CCS and minimize emissions from agricultural activity.

The County should partner with the CSU Extension to gather and disseminate information about local ranchers and farmers who, for example, use chopped hay for feed, implement a compost system to reduce waste and enrich soil or practice rotational grazing and increase winter grazing days. If County resources permit, the County should consider financial incentives (e.g. property tax rebates) to further encourage adoption of these practices.

10c. Incentivize the preservation of intact ecosystems to maintain existing carbon storage capacity, supporting the National Resource Conservation Service and other entities that work with landowners to create conservation easements.

Although the LUR already includes regulatory incentives for keeping agricultural land in production, or at least not being subdivided into parcels too small for agricultural use, experience shows that the most effective means of keeping agricultural land capable of CCS is the use of conservation easements. The County should continue to contribute to these efforts by endorsing grant applications, by offering County staff consultation on LUR and other relevant statutes and regulations, and by advocating for regulatory reform with appropriate state and federal agencies.

10d. If and when 10a is realized, when land assessed as agricultural is converted to non-agricultural (e.g. through subdivision development), require purchase of an offset equivalent to the decrease in CCS catalyzed by the shift in land use (or at a level scaled to size pending research on carbon levels in soil).

Clearly, converting agricultural land to residential use diminishes the amount of soil available for CCS. If the amount of lost CCS can be determined, as advised in Recommendation 10a, then it will be possible to mitigate that loss through local offsetting activities. Offsets can be executed directly by the developer (e.g. by producing renewable energy on-site), funded by the developer, or purchased by paying into a County segregated, special purpose fund.

10e. Incentivize distributed, small-scale food production through education, incentives, property tax incentives, rebates, tax credits or other mechanisms.

Small-scale local or regional food production incentives may serve as a source of economic development and enable conservation of existing agricultural lands. If foods are grown locally, Gunnison County may reduce overall CO_{2E} emissions through progressive soil management and sustainable production. The County

should support education, through the CSU Extension Office, of ranchers on small-scale food production and distribution. Other financial or tax incentives should be considered to support local food production.

10f. Support efforts that promote production, distribution and consumption of local goods.

The County should actively support the production and distribution of local goods through public support (e.g. press releases) and financial support. Local goods can be economic drivers for the County and may help reduce CO_{2E} emissions or at least sequester carbon in the soil. Several different groups and ranchers have identified the need for a mobile slaughter unit that would serve portions of the Western Slope region. This mobile unit would enable ranchers to slaughter and potentially process their beef locally, theoretically reducing costs of transporting the beef for slaughter. The County should support this effort through letters in support of grant applications or other means identified by mobile unit proponents. Gunnison County should also support efforts of regional ranchers and farmers to set up centralized processing and distribution facilities that would serve the County. This may entail supporting grant applications or financial support.

APPENDICES

Appendix I:
GLOSSARY OF TERMS

Best energy practices: Methods and techniques that have been demonstrated to minimize energy use and its impacts.

Building Performance Mitigation Program (BPMP): A fee mechanism requiring homeowners to meet a performance benchmark for new buildings through building efficiency, by installing a renewable energy system or by paying a renewable energy mitigation fee.

Carbon dioxide and its equivalents (CO_{2E}): Carbon dioxide equivalent is a means of quantifying any form of greenhouse gas emissions in terms of carbon dioxide in order to measure the impacts of various forms of greenhouse gases with greater consistency.

Coal Methane Capture project: Coal Methane Capture is a means of extracting methane gas from a coal mining operation for the purposes of transmitting the methane gas for commercial purposes or utilizing the gas on-site for power generation.

Carbon Capture and Sequestration (CCS): CCS is a means of storing CO_2 emitted from fossil fuel combustion in such a way that it is prevented from entering the earth's atmosphere.

Colorado Climate Action Plan: The CCAP is a strategy and policy document adopted in 2007, which is meant to guide the State of Colorado in efforts to meet its CO_{2E} emissions reductions and global warming prevention goals.

County taxing authority: Refers to the power retained by the County of Gunnison to assess certain taxes upon specific activities and property within its jurisdictional boundary.

Energy Action Plan: A set of policy recommendations and specific action items meant to assist an entity in meeting certain energy or climate related goals.

Energy audit: A scientific inspection and analysis of an object, building or operation that consumes energy.

Energy conservation worksheet: Additional specifications required by the County in addition to the adopted building code.

Fossil fuel: Fuels formed from natural resources (such as decomposed plant and animal matter), which are extracted and/or refined and combusted to emit heat energy.

Greenhouse gases: Certain gasses which, when emitted and stored in Earth's atmosphere, absorb solar radiation and result in a warming of the atmosphere.

Home Energy Rating System (HERS): A proprietary method of measuring the energy efficiency of a home and providing a baseline rating of that efficiency to form a consistent basis for comparison between structures.

Intergovernmental Panel on Climate Change (IPCC): A United Nations body charged with scientific research and analysis of the causes and impacts of Global Climate change, as well as developing policy recommendations for mitigating those impacts.

Land Use Regulations: Laws adopted by a governing body, which establish controls upon the use of lands within a jurisdictional boundary.

Nexus (aka Essential Nexus): The essential nexus test requires the government to establish a cause-and-effect connection between development and an identified public problem before placing conditions on development.

Open Meetings Law: "The Colorado Sunshine Law for open meetings legislates the methods by which public meetings are conducted. The Colorado sunshine law, first passed in 1973, was modified to include the current open meetings laws in 1996. Statute 24-6-402 of the Colorado code defines the law. The law states that all meetings of two or more members of any state public body where any public business is discussed must be open to the public. This definition includes in person, telephone or electronic communications. The law states that a gathering of a quorum or three or more individuals of a local body constitutes a meeting. The law also explicitly states that emailed messages discussing pending actions constitutes meetings and are subject to the law." Source: Sunshine Review

Property Assessed Clean Energy (PACE) Financing Program: "A Property Assessed Clean Energy (PACE) bond is a bond where the proceeds are provided to commercial and residential property owners to finance energy retrofits (efficiency measures and small renewable energy systems) and who then repay the financing over 20 years via an annual assessment on their property tax bill. PACE bonds can be issued by municipal financing districts or finance companies and the proceeds can be typically used to retrofit both commercial and residential properties." Source: http://pacenow.org/blog/

Road/Bridge Standards: A Gunnison Country Permit. "For any private driveway accessing onto a County road, public road or highway under the jurisdiction of Gunnison County; must meet the standards of the *Gunnison County Standards and Specifications for Road and Bridge Construction."* Source: http://www.gunnisoncounty.org/planning_permits_required.html

Solar access: The ability of sunlight to reach a solar collector or structure unimpeded by trees, fences, buildings or other obstruction.

Special Development Project Regulations: The *Gunnison County Special Development Project Regulations* governs proposed development, including all of its components and associated elements. Source: www.gunnisoncounty.org/planning_regulations_guidelines.html

Taylor River Hydro project: Gunnison County Electric Association **(**GCEA), the Upper Gunnison River Water Conservancy District (UGWCD) and the Uncompahgre Valley Water Users Association (UVWUA) have collaborated to fund a reconnaissance-level investigation into the potential addition of hydropower generation to the existing facilities at Taylor Park Reservoir. The initial feasibility study, performed by Denver's URS Corporation finds that "addition of hydropower generation capacity at Taylor Park Dam is feasible from a technical and economic perspective…the preferred conceptual layouts including two configurations of Francis turbines with operational capacities of 1.960 MW and 3.675 MW."

Triple bottom line: An accounting system that considers more than the traditional financial "bottom line". As well as financial outcomes, a company (or government's) performance should be measured against its social and environmental responsibilities, incorporating the three E's: equity, environment, economics (which are also referred to as the three P's: people, planet, profit).

Waunita Geothermal Potential: The BLM and USFS received a nomination for a competitive geothermal lease on two blocks of land in January, 2009. The nominated lands are all located in southeastern Gunnison County, north of Highway 50, in the general vicinity

of Tomichi Dome and the Waunita Hot Springs. The first step in developing geothermal resources on federal lands is to issue a lease for geothermal resources in a defined area. As of October, 2010 the preferred alternative of the BLM's Environmental Analysis (EA) is to lease the parcel with specific stipulations. The leasing of federal geothermal resources confers on the lessee a right to future exploration and development of geothermal resources within the lease area. However, it does not confer on the lessee the right to conduct any ground disturbing activities to explore for or develop geothermal resources. The four stages of geothermal resource development within a lease are exploration drilling, development, production, and closeout. Each of the four stages under the lease requires separate authorizations and NEPA compliance when ground-disturbing activities are proposed. The BLM's EA commissioned a reasonably foreseeable development scenario (RFDS), which speculates that if developed, a 5 – 10 MW binary air cooled geothermal facility could be possible in this area. The RFDS presented in the EA also documents a jobs creation potential scenario. The EA is available at www.blm.gov/co/st/en/fo/gfo/geothermal_lease_nomination.html

Appendix II:
KEY FACTORS LEADING TO THE ESTABLISHMENT OF THE TASK FORCE

Because:

Environment and Health

- Human consumption of fossil fuel energy has increased the levels of greenhouse gases in the atmosphere.
- The scientific community, including the US Global Change Research Program and Intergovernmental Panel on Climate Change (IPCC), has concluded that atmospheric accumulation of these gases has detrimental effects on ecosystems and living organisms.
- Federal (e.g. the Environmental Protection Agency [EPA]) and State authorities have determined that these detrimental effects pose a biological, environmental and public health hazard.
- Gunnison County is mandated to protect the health of its residents and environment.
- Colorado Revised Statute (CRS) 29-20-104(1)(h) grants Gunnison County the authority to plan for and regulate the use of land "so as to provide planned and orderly use of land and protection of the environment in a manner consistent with constitutional rights."
- Gunnison County acknowledges that the continued emissions of greenhouse gases into the atmosphere have detrimental effects on the health and environment of the County and its residents.
- Local economic viability depends in part on a clean, natural environment and healthy, financially stable workers.
- Gunnison County adopted the Energy Action Plan to guide County officials in the regulation of greenhouse gas emissions.
- The Gunnison County Carbon Policy Task Force was created to develop policy recommendations that will further the CO_{2E} reduction goal of 20% below 2005 levels by 2020 of the Energy Action Plan.
- **Therefore,** the Carbon Policy Task Force will propose policies and draft regulations that facilitate achievement of the Energy Action Plan reduction targets.

And Because:

Energy Security

- Gunnison County is dependent on imported fossil fuels to meet its energy needs.
- Supplies of fossil fuel energy worldwide are finite.
- Many of the regions supplying our fossil fuel energy are politically unstable and are not dependable as an energy source.
- Gunnison County has a vital interest in homeland security and protecting the availability of an essential commodity.
- Reducing energy needs and increasing local supplies would weaken the link between the County's energy supplies and issues of national security or diplomacy and decrease the County's vulnerability to paucity of supplies.

- Gunnison County possesses a number of potential energy generation resources and the capacity to reduce energy use through efficiency improvements in all sectors of the community.
- **Therefore,** the Carbon Policy Task Force is created to assist the County in reducing energy use and greenhouse gas emissions and increasing local, renewable energy production throughout the County to reduce its dependence on imported fossil fuels.

And Further, Because:

Economic Viability

- Access to affordable and reliable sources of energy is essential to the continued economic viability of the County.
- As supply and availability of fossil fuel energy sources decrease, cost will increase.
- Cost increases in fossil fuel based energy are likely and could negatively impact the economic health and viability of Gunnison County.
- Increases and fluctuations in the cost and availability of energy from fossil fuels is likely and will have a deleterious effect over time on economic activity and viability.
- Gunnison County has a vital interest in the viability and sustainability of local economic activities, resources and businesses.
- Efficiency improvements and development of local energy production capacity will help ensure stable energy costs, availability and reliability, reducing risks to local economic viability.
- Gunnison County adopted the Energy Action Plan to guide County officials in the regulation of greenhouse gas emissions and the management of energy resources.
- **Therefore,** the Carbon Policy Task Force is created to recommend changes to the use of energy County-wide, facilitate implementation of the Energy Action Plan and ensure the continued viability and sustainability of the local economy.

Appendix III:
SUMMARY OF 2005 CO_{2E} EMISSIONS INVENTORY

In 2007, the municipalities of Crested Butte, Gunnison, and Mt. Crested Butte, together with Gunnison County, sponsored the *Upper Gunnison River Watershed Greenhouse Gas Emissions Inventory*[17] covering the year 2005. The input data for the inventory was gathered from the valley's primary energy providers[18].

A summary of the report's findings for unincorporated Gunnison County is shown below. The table includes the reductions needed to meet a proposed 2020 objective of a 20% decrease in emissions.

Source of CO_{2E}	2005 Emissions CO_{2E} (Tons)	20% Reduction Target (Tons)
Residential Buildings		
- Electricity	43,000	
- Non-renewable Fossil Fuels	18,000	
Total for Residential Buildings	**62,000**	**12,000**
Commercial Buildings		
- Electricity	26,000	
- Non-renewable Fossil Fuels	5,000	
Total for Commercial Buildings	31,000	**6,200**
Total for all Buildings	**93,000**	**19,000**
Transportation		
- Gasoline	160,000	
- Diesel	15,000	
Total for Transportation	**180,000**	**35,000**
Waste (Landfill)		
- Paper Products	14,000	
- Food Waste	2,300	
- Plant Debris	1,900	
- Wood, Textiles, Other Fiber	1,700	
Total Landfill Emissions	**20,000**	**4,000**
Agricultural and Other		
- Methane[4]	20,000	
- Nitrogen Oxides (fertilizers)	88	
Total for Ag and Other	**20,000**	**3,900**
Total for UGRW in Unincorporated Areas	**310,000**	**61,000**

*** Emissions figures rounded to 2 significant figures (e.g. 40,971 would be rounded to 41,000)**

The Carbon Policy Task Force used these results, together with the recommendations of the Gunnison County Energy Action Plan Task Force and the Gunnison County Green Team's Energy Action Plan, in determining the most promising areas for policy and regulation.

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[17] See: http://www.crestedbutte-co.gov/vertical/Sites/%7B6058FFBB-CB06-4864-B42F-B476F794BE07%7D/uploads/%7B0C7C06CB-96BE-4E27-ABCE-2B371E8DA7FB%7D.PDF

[18] Primary data sources were: Gunnison County Electric Association and Gunnison Electric for electricity use, Atmos Energy for natural gas use, All Star Gas for propane use, the National Forest Service for fuel wood use, Waste Management for landfill use, and the Colorado Department of Transportation for vehicle use.

Appendix IV:
EXAMPLE - BUILDING PERFORMANCE MITIGATION PROGRAM

A Building Performance Mitigation Program creates incentives to design and build homes that exceed the minimum requirements established by the International Energy Conservation Code. The BPMP establishes thresholds for building energy performance for new residential construction based on the square footage of the home. It recognizes the fact that larger homes require greater energy use and, based on the CO_{2E} reduction goals established by Gunnison County, should have greater efficiency to mitigate impact.

Example: BPMP Performance Thresholds Based on Home Energy Rating System (HERS)

Type of project	Square footage	Required HERS Index
New construction	Up to 3,000	70
	3,001-5,000	60
	5,001 and up	50
Multi-unit dwellings	Applies to all	70%

Home energy use is estimated as part of a building permit application, given a preliminary review using energy performance rating software, and tested prior to issuance of a certificate of occupancy by an accredited energy rater using the Home Energy Rating System (HERS). In the HERS system, a home scoring 100 performs at the level of the IECC, a home that scores 0 has a net conumption of utility supplied energy of 0.

An example BPMP might be structured such that:

- Homes meeting given performance thresholds (or 5 points less) are not required to pay any additional permit fees,
- Homes that exceed performance thresholds may claim a rebate proportional to the measured performance increase, and
- Homes that fail to meet the performance threshold are assessed a mitigation fee proportional to the overage.

HERS is an asset-based metric and not related to the operation of the building; therefore, it is difficult to correlate actual energy use with modeled performance. It is possible, however, to identify a nexus between modeled performance and cost of the fee based on cost neutrality. According the National Renewable Energy Laboratory, a home performing 30% better than code, or a HERS 70, is cost neutral based on a 30-year mortgage cycle. This considers an average incremental cost increase of $5,500 in construction cost and utility bill cost savings. Although the relationship between incremental construction costs is not linear with modeled performance points, each HERS point may be assessed $183.00. Therefore a 3,500 square foot home with a HERS of 50 would receive an incentive of $1,830 while a similar home with a HERS of 65 would be assessed a fee of $915.00.

Appendix V:
EXAMPLE - LEED NEIGHBORHOOD DEVELOPMENT PROJECT SCORECARD

LEED 2009 for Neighborhood Development
Project Scorecard

Yes	?	No			
0	0	0	**Smart Location and Linkage**		27 Points Possible
Y			Prereq 1	Smart Location	Required
Y			Prereq 2	Imperiled Species and Ecological Communities	Required
Y			Prereq 3	Wetland and Water Body Conservation	Required
Y			Prereq 4	Agricultural Land Conservation	Required
Y			Prereq 5	Floodplain Avoidance	Required
			Credit 1	Preferred Locations	10
			Credit 2	Brownfield Redevelopment	2
			Credit 3	Locations with Reduced Automobile Dependence	7
			Credit 4	Bicycle Network and Storage	1
			Credit 5	Housing and Jobs Proximity	3
			Credit 6	Steep Slope Protection	1
			Credit 7	Site Design for Habitat or Wetland and Water Body Conservation	1
			Credit 8	Restoration of Habitat or Wetlands and Water Bodies	1
			Credit 9	Long-Term Conservation Management of Habitat or Wetlands and Water Bodies	1
Yes	?	No			
0	0	0	**Neighborhood Pattern and Design**		44 Points Possible
Y			Prereq 1	Walkable Streets	Required
Y			Prereq 2	Compact Development	Required
Y			Prereq 3	Connected and Open Community	Required
			Credit 1	Walkable Streets	12
			Credit 2	Compact Development	6
			Credit 3	Mixed-Use Neighborhood Centers	4
			Credit 4	Mixed-Income Diverse Communities	7
			Credit 5	Reduced Parking Footprint	1
			Credit 6	Street Network	2
			Credit 7	Transit Facilities	1
			Credit 8	Transportation Demand Management	2
			Credit 9	Access to Civic and Public Spaces	1
			Credit 10	Access to Recreation Facilities	1
			Credit 11	Visitability and Universal Design	1
			Credit 12	Community Outreach and Involvement	2
			Credit 13	Local Food Production	1
			Credit 14	Tree-Lined and Shaded Streets	2
			Credit 15	Neighborhood Schools	1
Yes	?	No			
0	0	0	**Green Infrastructure and Buildings**		29 Points Possible
Y			Prereq 1	Certified Green Building	Required
Y			Prereq 2	Minimum Building Energy Efficiency	Required
Y			Prereq 3	Minimum Building Water Efficiency	Required
Y			Prereq 4	Construction Activity Pollution Prevention	Required

Project Name:
Date:

Green Infrastructure and Buildings, Continued

Yes	?	No			
			Credit 1	**Certified Green Buildings**	5
			Credit 2	**Building Energy Efficiency**	2
			Credit 3	**Building Water Efficiency**	1
			Credit 4	**Water-Efficient Landscaping**	1
			Credit 5	**Existing Building Use**	1
			Credit 6	**Historic Resource Preservation and Adaptive Reuse**	1
			Credit 7	**Minimized Site Disturbance in Design and Construction**	1
			Credit 8	**Stormwater Management**	4
			Credit 9	**Heat Island Reduction**	1
			Credit 10	**Solar Orientation**	1
			Credit 11	**On-Site Renewable Energy Sources**	3
			Credit 12	**District Heating and Cooling**	2
			Credit 13	**Infrastructure Energy Efficiency**	1
			Credit 14	**Wastewater Management**	2
			Credit 15	**Recycled Content in Infrastructure**	1
			Credit 16	**Solid Waste Management Infrastructure**	1
			Credit 17	**Light Pollution Reduction**	1

Innovation and Design Process — 6 Points

Yes	?	No			
			Credit 1.1	**Innovation and Exemplary Performance**: Provide Specific Title	1
			Credit 1.2	**Innovation and Exemplary Performance**: Provide Specific Title	1
			Credit 1.3	**Innovation and Exemplary Performance**: Provide Specific Title	1
			Credit 1.4	**Innovation and Exemplary Performance**: Provide Specific Title	1
			Credit 1.5	**Innovation and Exemplary Performance**: Provide Specific Title	1
			Credit 2	**LEED® Accredited Professional**	1

Regional Priority Credit — 4 Points

Yes	?	No			
			Credit 1.1	**Regional Priority Credit**: Region Defined	1
			Credit 1.2	**Regional Priority Credit**: Region Defined	1
			Credit 1.3	**Regional Priority Credit:** Region Defined	1
			Credit 1.4	**Regional Priority Credit**: Region Defined	1

Yes	?	No		
0	0	0	**Project Totals (Certification estimates)**	110 Points

Certified: 40-49 points, **Silver:** 50-59 points, **Gold:** 60-79 points, **Platinum:** 80+ points

LEED 2009 for Neighborhood Development
Project Scorecard

Project Name:

Yes	?	No			
			Smart Location and Linkage		**27** Points Possible
Y			Prereq 1	**Smart Location**	Required
Y			Prereq 2	**Imperiled Species and Ecological Communities**	Required
Y			Prereq 3	**Wetland and Water Body Conservation**	Required
Y			Prereq 4	**Agricultural Land Conservation**	Required
Y			Prereq 5	**Floodplain Avoidance**	Required
			Credit 1	**Preferred Locations**	10
			Credit 2	**Brownfield Redevelopment**	2
			Credit 3	**Locations with Reduced Automobile Dependence**	7
			Credit 4	**Bicycle Network and Storage**	1
			Credit 5	**Housing and Jobs Proximity**	3
			Credit 6	**Steep Slope Protection**	1
			Credit 7	**Site Design for Habitat or Wetland and Water Body Conservation**	1
			Credit 8	**Restoration of Habitat or Wetlands and Water Bodies**	1
			Credit 9	**Long-Term Conservation Management of Habitat or Wetlands and Water Bodies**	1
Yes	?	No			
			Neighborhood Pattern and Design		**44** Points Possible
Y			Prereq 1	**Walkable Streets**	Required
Y			Prereq 2	**Compact Development**	Required
Y			Prereq 3	**Connected and Open Community**	Required
			Credit 1	**Walkable Streets**	12
			Credit 2	**Compact Development**	6
			Credit 3	**Mixed-Use Neighborhood Centers**	4
			Credit 4	**Mixed-Income Diverse Communities**	7
			Credit 5	**Reduced Parking Footprint**	1
			Credit 6	**Street Network**	2
			Credit 7	**Transit Facilities**	1
			Credit 8	**Transportation Demand Management**	2
			Credit 9	**Access to Civic and Public Spaces**	1
			Credit 10	**Access to Recreation Facilities**	1
			Credit 11	**Visitability and Universal Design**	1
			Credit 12	**Community Outreach and Involvement**	2
			Credit 13	**Local Food Production**	1
			Credit 14	**Tree-Lined and Shaded Streets**	2
			Credit 15	**Neighborhood Schools**	1
Yes	?	No			
			Green Infrastructure and Buildings		**29** Points Possible
Y			Prereq 1	**Certified Green Building**	Required
Y			Prereq 2	**Minimum Building Energy Efficiency**	Required
Y			Prereq 3	**Minimum Building Water Efficiency**	Required
Y			Prereq 4	**Construction Activity Pollution Prevention**	Required
			Credit 1	**Certified Green Buildings**	5
			Credit 2	**Building Energy Efficiency**	2
			Credit 3	**Building Water Efficiency**	1
			Credit 4	**Water-Efficient Landscaping**	1
			Credit 5	**Existing Building Use**	1
			Credit 6	**Historic Resource Preservation and Adaptive Reuse**	1
			Credit 7	**Minimized Site Disturbance in Design and Construction**	1
			Credit 8	**Stormwater Management**	4
			Credit 9	**Heat Island Reduction**	1
			Credit 10	**Solar Orientation**	1
			Credit 11	**On-Site Renewable Energy Sources**	3
			Credit 12	**District Heating and Cooling**	2
			Credit 13	**Infrastructure Energy Efficiency**	1
			Credit 14	**Wastewater Management**	2
			Credit 15	**Recycled Content in Infrastructure**	1
			Credit 16	**Solid Waste Management Infrastructure**	1
			Credit 17	**Light Pollution Reduction**	1
Yes	?	No			

Yes	?	No			
			Innovation and Design Process		6 Points
			Credit 1.1	**Innovation and Exemplary Performance**: Provide Specific Title	1
			Credit 1.2	**Innovation and Exemplary Performance**: Provide Specific Title	1
			Credit 1.3	**Innovation and Exemplary Performance**: Provide Specific Title	1
			Credit 1.4	**Innovation and Exemplary Performance**: Provide Specific Title	1
			Credit 1.5	**Innovation and Exemplary Performance**: Provide Specific Title	1
			Credit 2	**LEED® Accredited Professional**	1
Yes	?	No			
			Regional Priority Credit		4 Points
			Credit 1.1	**Regional Priority Credit**: Region Defined	1
			Credit 1.2	**Regional Priority Credit**: Region Defined	1
			Credit 1.3	**Regional Priority Credit:** Region Defined	1
			Credit 1.4	**Regional Priority Credit**: Region Defined	1
Yes	?	No			
			Project Totals (Certification estimates)		110 Points

Certified: 40-49 points, **Silver:** 50-59 points, **Gold:** 60-79 points, **Platinum:** 80+ points

Appendix VI:

Special Development Project Regulations Resolution

EXAMPLE FRAMEWORK: ENERGY CONSUMPTION MITIGATION PROGRAM

Recommendation 5c calls for amending the SDPR to require projects to mitigate their energy consumption by implementing measures such as:

- In-County energy offsets funded directly by the project,
- On- or off-site alternative energy production,
- Energy efficiency measures,
- Carbon capture and sequestration (CCS) and other forms of CO_{2E} reductions,
- Contribution to a Gunnison County energy consumption reduction program.

The last of these, a County energy consumption reduction program would provide an applicant an option analogous to a development improvement agreement, tailored toward reducing the County's energy consumption. The program might operate like this:

1. Once the applicant's energy consumption projections have been approved, a dollar figure is calculated, based on the projected peak annual energy consumption and a County-determined impact assessment per kilowatt hour of consumption (note that motor fuel, heating fuel, and other energy costs can be readily converted into kilowatt-hours.)
2. The amount calculated in step 1 is either (a) deposited in a segregated, interest-bearing account held by the County, or (b) a qualified surety, paid for by the project and covering the calculated amount, is provided to and retained by the County.

3a. In the event that the project puts up cash, the funds are retained for a fixed period (e.g., the life of the project) and become the property of the County after the end of project operations, except that the project may be reimbursed from the funds deposited for additional mitigation measures it undertakes. The amount of reimbursement is calculated on the basis of the fraction of the project's consumption that is reduced by the mitigation measure. This means that, in principle, a project could recover all of its deposit, together with interest accrued.

3b. In the event that the project puts up a surety, the County retains the surety (annually renewed by the project) for the life of the project, except that the required amount of the surety may be reduced if the project undertakes additional mitigation measures. The percentage reduction in the required surety is reduced on the basis of the fraction of the project's consumption that is reduced by the mitigation measure. This means, in principle, that the surety could be reduced to zero if the project's energy consumption were fully mitigated. The surety obligation would cease after the end of project operations.

4. Any funds in the segregated accounts unclaimed after the end of project operations would be transferred to a segregated account to be used for designated energy reduction programs.