



Resource and Energy Action Plan (REAP):

Action Plan

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Governor's
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Revisions	Date	Page #
Modified S.M.A.R.T. Goals and Desired Projects Inventory	Jan 12, 2012	7-19
Modified Deliverable statements with where completed documents can be found	Jan 25, 2012	5
Updated Desired Projects Inventory	March 5, 2012	24
Inserted Health Nexus Section	March 5, 2012	20-23



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Summary

The Resource and Energy Action Plan (REAP) consists of four phases. Phase 1 entails assessing energy use, community projects and developing the REAP Strategy, a guide to multi-jurisdictional energy action planning. The Strategy provides a framework to facilitate and streamline multi-sector collaboration in our region's efforts to effectively manage resources, reduce energy costs, and meet energy and water usage reduction goals. Phase 2 adds Action Plan details to the Strategy document. Phase 3 involves reassessing existing water and material conservation plans and energy and building codes that may result in modifications to proposed REAP Action Plans. And finally, Phase 4 involves engaging networks in Southwest Colorado to implement the plan.

Our region includes Archuleta, Dolores, La Plata, Montezuma, and San Juan Counties and the Southern Ute and Ute Mountain Ute Indian Reservations. The REAP Action Plan draws upon leadership and expertise provided by a 65-member regional Advisory Board (see Appendix A). 4CORE thanks the Advisory Board members who have actively participated in this process.



REAP Advisory Board at work

Single jurisdictions typically do not have the financial resources or population to leverage economies of scale. By developing partnerships and sharing resources through the REAP, the communities of this region can continue to build capacity for the implementation of resource-efficient programs and projects.

The REAP Action Plan adheres to the concept of the "Triple Bottom Line," placing importance on incorporating "People, Planet, and Economy" as values. The REAP Action Plan document includes a mission statement, vision, introduction, upcoming deliverables,

guiding principles, S.M.A.R.T goals (specific, measureable, agreed-upon, realistic, and timely) with detailed action plans, and a desired projects inventory. None of these recommendations are binding and are intended to unite the region in resource efficiency and long term stability.

The S.M.A.R.T goals for our community were developed at meetings held throughout 2010 and early 2011 based on the findings of our region's Community and Energy Assessments.¹ The Action Plan is designed to set up strategies and actions to achieve the goals. In doing so, the Action Plan will enable REAP communities to reduce energy use, effectively integrate the existing energy industry, develop renewable energy resources and realize economic benefits.

The Action Plan was created to show the region's governments and stakeholders what the Strategy and S.M.A.R.T. goals can look like, as well as to serve as a reference tool for

¹ Community Assessment available:

http://www.fourcore.org/Portals/0/Documents/REAP/Products/SWCO_Community_Assessment.pdf

And Energy Assessment available:

http://www.fourcore.org/Portals/0/Documents/REAP/Products/EnergyAssessment_SWColorado.pdf



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implementation of the goals. The Action Plan was also developed to initiate the process of identifying and beginning resource-related programs and any community-supported policies.

Mission

Ensure Southwest Colorado uses resources and energy effectively and efficiently to create economic opportunities and improve quality of life by developing and implementing the Resource & Energy Action Plan.

Vision

Southwest Colorado will REAP the benefits of effective use of resources and sustain a thriving region of rural, agricultural, and mountainous communities.

Introduction

The Southwest Colorado region consists of Archuleta, Dolores, La Plata, Montezuma, and San Juan Counties and the Southern Ute and Ute Mountain Ute Indian Reservations. The Colorado State Demographer's Office estimates the population at 91,805 in 2010. The major municipalities located in the region include the cities of Pagosa Springs, Durango, and Cortez, and the towns of Bayfield, Dolores, Dove Creek, Ignacio, Mancos, Pagosa Springs, Rico, Silverton, and Towaoc.

The counties and municipalities that comprise this area consist of diverse economies, demographics, and environments. The region's electricity is provided by Empire Electric Association, La Plata Electric Association and San Miguel Power Association, all of which fall under the cooperative system overseen by Tri-State Generation and Transmission Association. Atmos Energy and Source Gas provide natural gas throughout the region. Approximately 11 privately owned companies supply propane to residents and businesses, and many of San Juan County's businesses and residents are heated by coal.

As technology and funding evolve, the REAP Action Plan may be modified to reflect changes in the priorities and capabilities of resource conservation opportunities in the region.



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Deliverables:

Completed Deliverables can be downloaded from the REAP web page here:

<http://www.fourcore.org/EnergyActionPlans/ResourceEnergyActionPlan.aspx>

Transportation Study and Plan

Region 9 Economic Development District of Southwest Colorado completed a transit feasibility study in 2009. In addition, a 2035 Regional Transportation Plan was completed in 2008. These documents will be used as spring boards to build relationships between REAP Advisory Board and the Transit Coordinating Council. Please see S.M.A.R.T Goal # 5 for specific information.

Water Conservation Plans

The following municipalities in Southwest Colorado have water conservation plans in place: Cortez (Water Conservation Plan 2010), Durango (Water Efficiency Management Plan 2011), Ignacio (Water Conservation Ordinance 179, 7-11-00, Ordinance 258, November 14, 2007), and Pagosa Springs (Pagosa Area Water & Sanitation District Water Conservation Plan, 2008). Cortez, Durango, and Pagosa Area Water & Sanitation District have all registered their plan with the Colorado Water Conservation Board.

Material Conservation Plan

Material conservation programs are implemented in at least 3 of the 5 counties through local recycling programs. The City of Durango and parts of Montezuma County are looking for ways to expand their recycling services. REAP S.M.A.R.T Goal # 6 seeks to address the need for a regional resource recovery system. Through the implementation of this goal, the region will learn about the systems that can be put in place to generate revenue, create new markets and jobs, and reduce waste. This will also be an example for other regions as to how communities can effectively re-use their waste.



Guiding Principles

Energy & Conservation:

Ensure significant progress toward more efficient, safe and healthy resource technologies in order to enhance, promote, and diversify the local economy and job market; support and strengthen the region's agriculture and building sectors; and engage and integrate the existing energy industry.

Economic Vitality & Diversity:

Encourage local economic development and consumption that preserves and protects our heritage, natural resources, agriculture and energy production, thus providing opportunities for our diverse population to thrive in Southwest Colorado.

Infrastructure:

Improve, expand and diversify community systems and services, such as transportation, public utilities, and resource recovery options.

Vibrant & Involved Community:

Increase communication between all sectors and cultures throughout our region; promote education and involvement in existing and potential energy and economic opportunities.

Environmental Stewardship:

Protect, conserve, and ensure the quality of our ecological resources



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S.M.A.R.T. Goals with Action Plans

The Advisory Board established S.M.A.R.T. Goals to help implement the REAP mission and achieve its vision. These goals are listed in order of prioritization. After completion of the goals, specific action plans were created with an analysis of the opportunities, barriers and strategies for each plan to maximize success.

S.M.A.R.T Goal Priority #1: Create a prioritized list of recommendations to promote renewable energy (RE) development in conjunction with conventional energy in the five-county region for residential, commercial, industrial and municipal interests by June 30th, 2012.

Goal/Effect:

- Determine what energy sources are the most feasible to pursue in the near future, taking into consideration financial, technological and geographic concerns

Action Plan:

1. Create a baseline analysis of current energy use and generation in the five Counties (Completed by 4CORE 12/17/10; available at <http://www.fourcore.org/energyactionplans.html>).
2. Develop a RE and conventional energy REAP work group by June 30th, 2012, identifying the key people to collaborate and engage (REAP Advisory Board).
3. Design RE and conventional energy targets and measurable goals (REAP work group facilitated by 4CORE). June 30th, 2012
4. Create easy-to-use worksheet on cost/benefit analysis for conventional vs. alternative energy sources to include opportunity costs (4CORE). May 15, 2012
5. Generate RE Feasibility Report (REAP work group facilitated by 4CORE) to be shared at an EE/RE providers' guild meeting with a request for implementation support. June 30, 2012
6. Implement Feasibility Report proposed actions for areas of growth and development in RE (to be identified in the RE Feasibility Report).

Possible Coordination/Support for Implementation Plan:

Entity / Function	Name
Town of Rico	Barbara Betts
Colorado School of Mines	Dr. Masami Nakagawa (Geothermal & Sustainability)
NREL	Dr. John Lund (Ground source heat pump)
USFS/BLM	M. Stiles, Bill Dunkelberger (Durango)
USGS	Dr. Paul Morgan (Geothermal and mineral resource)
CMC	Nancy Genova
S.U.I.T	Peter Dietrich
GEO	Joani Matranga
BP	Julie Levy
La Plata County	Susan Hakanson
Cortez	Joy Herrington



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City of Durango	Mary Beth Miles
Stetz Consulting	Mark Stetz
Southwest Solar Trade Association	John Shaw, Derek Wadsworth, Ben Jason, Curtis Jackson
Empire Electric Association	Bobbe Jones
La Plata Electric Association	Mark Schwantes

Implementation Opportunities, Barriers and Strategies:

Educational (Training/Awareness) Strategies:

- Educate community on the list of recommendations after it has been developed

Implementation Mechanisms: (Law/Policy/Code Changes; Incentives (Economic, Payments, Market, non-monetary); Livelihood and Business Opportunities:

- Collaborate with Tri-State, GEO, NREL, LPEA
- Request For Proposals
- Long-term rates for purchase
- Benefit LPEA by targeting “trouble spots” in transmission for RE development

Potential Barriers to Consensus and Suggested Alternative Solutions:

- Power purchase agreement with power provider
- Engage Tri-State and Atmos in the effort

Potential Implementation Barriers and Suggestions to Overcome Barriers:

- Tri-State: cost of running additional lines – design development to take advantage of existing lines
- Crossing permits
- Competing status-quo energy sources

Suggested Funding Mechanism:

- Partnerships with colleges and universities (CSU, CSMines, Rotter Policy Center, Fort Lewis College, Southwest Colorado Community College) – use their expertise
 - Grants for feasibility, but must have a market mechanism for execution
 - Implementation through private sector
-



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S.M.A.R.T Goal Priority #2: Assist building owners in recognizing energy efficiency (EE) improvements needed to reduce energy use in residential and commercial buildings by at least 10% in all five counties by 2012.

Goal/Effect:

- Commercial and residential building owners take a strong interest in their energy use and ways to improve that use.
- All five counties have an appreciation for commercial and residential building owners that take steps towards EE and publicly acknowledge them.
- Energy efficiency mechanisms are seen as simple and valuable.

Action Plan:

1. Create incentives for EE by collaborating with local governments, local utility providers, and local banks (4CORE). June 30th, 2012
2. Increase regional collaboration for funding and education (4CORE). Track energy use changes using the baseline analysis of current energy use for the SW Colorado region (created in Goal #1) (4CORE).
3. Provide technical assistance and data to those interested in making EE improvements, including information on all available incentives and a list of local providers for upgrades and improvements (4CORE).
4. Increase awareness of what is already happening: what is working and already being accomplished, taking advantage of momentum to drive initiatives forward (4CORE).

Possible Coordination/Support for Implementation Plan:

Energy Auditors	4CORE Website List
Resource Smart Business Program	4CORE
HomeRx Program	4CORE
Empire Electric Association	Doug Sparks
La Plata Electric Association	Mark Schwantes
San Miguel Power Association	Gary Miller
Government Officials from all five Counties	See REAP Advisory Board List

Implementation Opportunities, Barriers and Strategies:

Educational (Training/Awareness) Strategies:

- Bring the public, government officials, utilities, etc, together to do a walk through energy evaluation of a prominent building and point out the energy inefficiencies. Then discuss the rebates, incentives, and simplicities of energy efficient improvements.²

Implementation Mechanisms: (Law/Policy/Code Changes; Incentives (Economic, Payments, Market, non-monetary); Livelihood and Business Opportunities:

- Showcase businesses that conducted an energy evaluation and implemented recommended measures through the Resource Smart Business Program

² As of March 12th 2012, 4CORE has conducted demonstration audits in the towns of Silverton and Rico.



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- Assess municipal buildings (Silverton, San Juan County, City of Cortez, and Rico municipal buildings) and present results through educational sessions

Potential Barriers to Consensus and Suggested Alternative Solutions:

- Mindset that EE is complicated and always expensive – Three tiered energy evaluation approach 1. Walk through 2. Technical Evaluation 3. Energy Star Evaluation, giving the owner a choice. This approach makes EE changes more inviting and less cost prohibitive. Show and tell with businesses that have completed any of the EE evaluations providing tangible examples, simple to understand information with peer to peer experience sharing.

Potential Implementation Barriers and Suggestions to Overcome Barriers:

- Building owners not understanding the importance and money savings to be had through EE – Show and tell sessions with tangible examples

Suggested Funding Mechanism:

- Resource Smart Business Program (Climate Showcase Communities grant)
- Banks & other local supporters
- LPEA's Main Street Efficiency Initiative

S.M.A.R.T Goal Priority #3: Beginning in 2013, 10% of homes sold per year will have energy audits; 5% of homes sold per year would implement recommended upgrades.

Goal/Effect:

- Tenants and buyers of residential buildings would want true energy cost information to make an informed decision
- Tenants and buyers of residential buildings would see the value in auditing their building and demand true energy costs

Action Plans:

1. Educate realtors on the benefits of energy efficiency as a promotional tool for selling homes by July 31, 2012 (REAP work group).
2. Realtors promote home energy and water audits to both sellers and buyers and include financial incentives for EE and a list of local contractors to the homeowner and potential buyers (REAP work group). October 31, 2012
3. Promote energy audits as a part of home inspection (REAP work group)
4. Work with utilities to improve incentives for energy audits (see S.M.A.R.T. Goal #2, first bullet).

Possible Coordination/Support for Implementation Plan:



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Entity / Function	Name
SASCO	Werner Heiber, Elsa Jagniecki
Coldwell Banker Heritage House Realtor, Durango Realtor's Association	Heather Erb
M-CAN	Jodi Foran
First National Bank, Vice President, Mortgage Department	Julie Cooley
Local government officials and building department representatives	See REAP Ad Board List
HomeRx Program	4CORE

Implementation Opportunities, Barriers and Strategies

Educational (Training/Awareness) Strategies:

- Power to the People/Right to Know! Campaign, which would include education on the importance and benefits of living in an energy efficient home
- Educate realtors on the benefits of energy efficient homes and how to promote them
- Reach out to appraisers and mortgage lenders to educate on the value of EE and RE home improvements

Implementation Mechanisms: (Law/Policy/Code Changes; Incentives (Economic, Payments, Market, non-monetary); Livelihood and Business Opportunities:

- Eventually push for the implementation of an ordinance requiring energy and water audits at the time of sale
- 4CORE's potential Home Performance Prescription Program (HomeRx)

Potential Barriers to Consensus and Suggested Alternative Solutions:

- Ignorance/Apathy – “Power to the People/Right to Know!” Campaign
- Property rights groups protesting new regulation - Emphasize that this action does not require the homeowner to make any unwanted changes to their home, it is only designed to enhance information disclosure to homebuyers
- Some people may say this action unfairly targets older leaky homes - Homebuyers are able to access home inspection reports that assess things such as the roof and foundation; an energy and water audit is just placing valuation on a new set of criteria

Potential Implementation Barriers and Suggestions to Overcome Barriers:

- Same as barriers to consensus

Suggested Funding Mechanism:



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- Grants- CARHOFF
 - Guaranteed savings
 - Bank loans through EE lending and Green Colorado Credit Reserve (GCCR)
 - Other organizations – collaboration
-

S.M.A.R.T. Goal Priority #4: Increase community awareness (10% of the population per year beginning in 2012) of the importance and benefits of existing and future resource and energy conservation mechanisms, EE/RE ideas, models, and available services. Emphasize collaboration between all sectors.

Goal/Effect:

- Educate the community in general, as well as targeted networks and groups in order to foster buy-in to create a credible Resource & Energy Action Plan
- Reach out to all sector representatives: (1) identify the best way to dialogue with specific sectors and (2) determine the lead time needed by interviewing advisory board members.
- Create enthusiasm in the region for EE/RE

Action Plans:

1. Reach out to all sector representatives; (1) identify the best way to dialogue with specific sectors and (2) determine the lead time needed by interviewing advisory board members (4CORE). June 30th, 2012.
2. Increase public awareness of the REAP by June 2012 as measured by outreach metrics (press pick-up, radio ads, website visits, social media, etc.) in order to create a credible Resource & Energy Action Plan (4CORE).
3. Create a REAP Outreach Plan, complete with the cost of disseminating information to each sector, by March 30th, 2012 (4CORE), including the following:
 - a) Specific marketing material (unique language and messaging) for each sector (4CORE). Sectors include:
 - Agriculture
 - Oil & Gas
 - Home Owners
 - Renewable Energy Suppliers/Installers
 - Children and Students (“next generation”)
 - Transportation
 - Business
 - Public Lands
 - Construction
 - Health Industry
 - b) Identify and engage public, private, non-profit and community experts to assist with specific marketing materials, in addition to participating advisory board members (4CORE).
4. Initiate a REAP Outreach Campaign (4CORE)



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Possible Coordination/Support for Action Plan:

Entity / Function	Name
SWConnect	Terry Woodward
Traditional media	4CORE
Social media	4CORE
Events/Lectures	Craig Leggett, BBL, GBR

Implementation Opportunities, Barriers and Strategies

Educational (Training/Awareness) Strategies:

- SWConnect Marketing Plan- through partner networks, word of mouth and some media
- Actions 2-6 listed above are educational strategies in and of themselves.
- Presentations and participation in the SW Council of Governments

Implementation Mechanisms: (Law/Policy/Code Changes; Incentives (Economic, Payments, Market, non-monetary); Livelihood and Business Opportunities:

- Education and outreach (see above strategies)
- Keeping money local – When implementing EE/RE, use local providers which helps circulate the money through the region

Potential Barriers to Consensus and Suggested Alternative Solutions:

- Public perception of “us vs. them” - personal and individual relationships must be developed and considered, especially when working at the network level. The existing REAP Advisory board could be tapped for these network liaisons. Frame EE/RE as an economic opportunity

Potential Implementation Barriers and Suggestions to Overcome Barriers:

- If the outreach methods are presented in a way that threatens the values of individuals, large barriers to this process will be raised. Developing “question based” articles and FAQs that don’t “preach” but educate, will hopefully create a more welcoming, neutral feeling.

Suggested Funding Mechanism:

- Align our education efforts with business and other organizations’ interests – tie into existing publications, tag on to existing ads, etc.
- Leverage funds from 4CORE and other related organizations – distribute the workload by asking for help from others and receive donated time/services. Examples could be LEED, Region 9, or SW COG (groups with a similar mission and geographic regions).



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S.M.A.R.T Goal Priority #5: Work with the Transit Coordinating Council and the existing Southwest Colorado Regional Transit Feasibility Study to implement action items which increase the availability and usage of mass transit in our region.

Goal/Effect:

- Cut down on the miles driven in SW Colorado and implement a more sustainable and efficient regional/community transportation system.
- Connect Pagosa Springs, Dove Creek, and Cortez, including points along the U.S. Highway 160 corridor, with Durango.

Action Plans:

1. Work to build capacity of regional transit providers and increase available transit options (REAP work group in coordination with the Transit Coordinating Council).
2. Identify experts, inhibitors, assets, influencers (REAP work group and 4CORE).
3. Analyze the successes and failures of transit plans from other areas to increase the effectiveness of implementation (REAP work group and 4CORE).
4. Engage the private sector through education to get buy-in and document buy-in by requesting and filing letters of support for increased availability of public transit (REAP work group and 4CORE).

Possible Coordination/Support for Action Plan:

Entity / Function	Name
REAP Advisory Board	Elected Representative TBD
Transit Coordinating Council	John Ehmann
Region 9 Economic Development District	Laura Lewis Marchino

At this time, the REAP Advisory Board would like to gather more information on the development of the Southwest Colorado Regional Transit Feasibility Study before determining implementation opportunities, barriers, and strategies. 4CORE will attend COG transportation meetings and provide support for implementing their plan.

S.M.A.R.T Goal Priority #6: Foster the development of a regional resource recovery system by 2015.

Goal/Effect:

- Waste reduction
- Energy recovery
- Pollution prevention
- Job creation



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- Local self-reliance/self-sufficiency

Action Plans:

1. Hold a Regional Recycling Roundtable to bring recycling providers together to discuss potential opportunities for collaboration and ways to increase economies of scale. TBD (4CORE)
2. Complete a feasibility study for a new regional recycling facility. December 28th, 2012 dependant on receiving RREO grant funds (Phoenix Recycling, LLC and 4CORE):
3. Conduct community workshops on how to be creative with waste and help create new jobs (compost, mulch, recycled glass products, furniture repair, art, etc.) (4CORE and Fort Lewis College Environmental Center).
4. Encourage the creation of incentives through collaborating with local governments and industry (Work with S.M.A.R.T. Goal #2, first bullet).

Possible Coordination/Support for Action Plan:

Entity / Function	Name
Phoenix Recycling	Mark Thompson
Waste Management	Four Corners Division
Waste Corp. of America	Bondad Landfill
City of Durango	Mary Beth Miles
Archuleta County Landfill	Public Works: Solid Waste Department
Montezuma County Landfill	Deborah Barton
Baker Sanitation	Loren Workman
Four Corners Recycling Initiative	Ashton Hargrave
San Juan Basin Recycling Association	Janalee Hogan

Implementation Opportunities, Barriers and Strategies

Educational (Training/Awareness) Strategies:

- Community education on what to recycle, as well as why and how

Implementation Mechanisms: (Law/Policy/Code Changes; Incentives (Economic, Payments, Market, non-monetary); Livelihood and Business Opportunities:

- Resource Recovery Park (RRP) (financial incentives to recycle and save money)
- Pay as you throw (PAYT) for collection

Potential Barriers to Consensus and Suggested Alternative Solutions:

- Resistance from haulers and landfill operators, as such a system would reduce their income
- Initial capital costs
- Figuring out initial strategy and plan



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- It is currently cheap to throw away – a disincentive to recycling

Potential Implementation Barriers and Suggestions to Overcome Barriers:

- Lack of communication and collaboration – SWConnect as a solution
- Capital cost – Bring in many funders/solicit support from well-known names in the public, RREO grant funds
- Location
- Low landfill tip fees – increase cost of disposal
- Cost of transportation – possible fleet rate
- Regulation too strict on the state level, difficult to permit a compost facility
- Push to just re-vamp existing recycling facility – show the difference between the existing facility and the potential of a RRP
- Geographic isolation, cost of shipping outside the region
- Lack of leadership

Suggested Funding Mechanism:

- Grants
 - PAYT, transition to weight based disposal fees
-



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S.M.A.R.T Goal Priority #7: Incentivize RE and EE in new building construction by working with the city/county building departments in all five counties to encourage a reduction in RE and EE building permit costs by October 2012.

Goal/Effect:

- Use the carrot (incentives), not the stick (regulations) to accomplish this goal.

Action Plans:

1. Identify current permits required, costs and process (REAP work group). June 30th, 2012
2. Attend town/city/county work sessions to determine how to reduce building permit costs for construction that utilizes EE and RE (REAP work group).

Other ideas to assess during implementation planning:

- Property tax incentives
- Impact fees should be reduced/adjusted with tiered approach to level of impact
 - Prescriptive approach: less inspection needed
 - Performance approach: more inspection needed
- Ensure ease of use for permitting agencies across southwest Colorado (some don't have the staff resources this may require)
- Education at time of land purchase BEFORE building occurs (potential entities to provide education: permitting agency, 4CORE, LEED, others)
- Restructure the CO Gallagher Amendment, which currently charges more taxes for vacant land than land with homes on it to encourage development.

Possible Coordination/Support for Action Plan:

Entity / Function	Name
Archuleta Building Department	John Sjoblom / Sherrie Vick
City of Cortez Building Department	Sam Proffer
La Plata Building Department	Butch Knowlton
San Juan Building Department	Dee Jaramillo

Implementation Opportunities, Barriers and Strategies

Educational (Training/Awareness) Strategies:

- If RE/EE permit costs are lowered, educate the land owner/builder on what opportunities are available to them (if you do this, you benefit by...)
- Educate community on benefits of EE/RE building design
- Educate builders on benefits of EE/RE building design, and how to do it (continue 4CORE's Sustainable Building Education series)
- Engage builders through existing builder networks, such as the builder's associations



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- Track ENERGY STAR and LEED-built homes and re-sale value to demonstrate value of EE and RE for future construction

Implementation Mechanisms: (Law/Policy/Code Changes; Incentives (Economic, Payments, Market, non-monetary); Livelihood and Business Opportunities:

- Code changes to incentivize RE/EE permitting costs
- Continue to grow interest and use of RE/EE for new and existing construction
- 4CORE HomeRx program (mentioned above)
- GCCR funding (mentioned above)

Potential Barriers to Consensus and Suggested Alternative Solutions:

- All five counties may not agree to implement code changes. A solution is an educational presentation for all the building departments together on RE/EE and the benefits. Discussion session for building officials should be held to share successes and lessons learned.

Potential Implementation Barriers and Suggestions to Overcome Barriers:

- Public/Builders/Architects/Realtors/Etc. knowing about the code change and passing it on to the public. A solution is to hold county meetings to talk about the changes and benefits the new code brings

Suggested Funding Mechanism:

- At this time, funding mechanisms are not seen as necessary for this goal.

S.M.A.R.T Goal Priority #8: Develop a collaborative mechanism for working with public lands sectors and management by April 30, 2012 in order to accomplish REAP goals.

Goal/Effect:

- Expand energy portfolio.
- Reuse “unusable” land.

Action Plan:

1. Explore and develop an MOU (Jennifer Stark).
2. Identify, engage, and bring public lands representatives from the Bureau of Land Management, state lands, water districts, etc. to the advisory board (4CORE).

Possible Coordination/Support for Action Plan:

Entity / Function	Name
Public Lands	Mark Stiles
US Forest Service	Gretchen Fitzgerald



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DOE	Tony Esolen
BLM	Debbie Kill
State Trust Lands	Kit Page/Laura Gomez
CSU Extension Office	Tom Hooten

Implementation Opportunities, Barriers and Strategies

Educational (Training/Awareness) Strategies:

- Informational meetings where success stories are shared

Implementation Mechanisms: (Law/Policy/Code Changes; Incentives (Economic, Payments, Market, non-monetary); Livelihood and Business Opportunities:

- Collaboration and increased communication between sectors

Potential Barriers to Consensus and Suggested Alternative Solutions:

- Convincing public officials to consider these suggestions

Potential Implementation Barriers and Suggestions to Overcome Barriers:

- Entities who consider it unfair to incentivize certain activities over others

Suggested Funding Mechanism:

- A low level of funding is needed if taxes or leases are not assessed and proposal points are awarded. This can be accomplished by process and rule changes.



The Energy-Health Nexus

Contributed by Healthy Community Solutions
www.healthycommunitysolutions.com

Energy fuels our cars, our trucks, our planes, our cities, our homes, and our bodies. It powers our lives and touches everything we do, everything we eat, the air we breathe, and the water we drink. How we obtain and use energy has profound impacts, both direct and indirect, on our health. This nexus between energy and health isn't always obvious but it is both broad and profound in scope. With inexpensive oil resources, cars, trucks, planes are being used in place of efficient streetcars, trains, bicycles, and sturdy walking shoes. Food production has become centralized and mechanized-- again dependent on fossil fuels to grow crops faster, bigger, and more efficiently. Calories, like transportation, are now inexpensive and easy. One in three people in the US are obese and suffering from chronic disease. (CDC 2012:

<http://www.cdc.gov/chronicdisease/resources/publications/AAG/chronic.htm>) As a result, our children will for the first time in human history have a life expectancy less than their parents. (New England Journal of Medicine, 2005

<http://www.nejm.org/doi/full/10.1056/NEJMs043743>) Medical care and pharmaceuticals are also almost wholly dependent on fossil fuels. Equipment and supplies in hospitals are plastic, disposable, and made from chemicals. As fossil fuels become less plentiful the price will rise and all medical care and drugs will become exorbitantly expensive, available to only those who can pay. An increasingly sick population traveling down the road of increasingly expensive health care is an economic and social disaster waiting to happen.

Southwest Colorado is known for its pristine landscapes, clear air, and culture of active living. While Coloradoans pride themselves on living in one of the most beautiful places in the world, this beauty does not make us immune from many of the troubling health indicators that threaten quality of life in our region. If health is "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (World Health Organization), we must acknowledge the inextricable links between health, the natural environment (water, air, etc.), the built environment (including dominant transportation models) and energy policy.

Generalizing about the health of a five county region is difficult, given that there are enormous differences in lifestyles and environments within and among those counties. However, perhaps the most significant health issue for all five counties Southwest Colorado is lack of access to care, especially for the uninsured. "The estimated percentage of uninsured southwest Coloradoans exceeds the estimated state percentage for every county. San Juan county is one the top seven counties in the state with the highest percentages of uninsured" (Region 9 Economic Development District). While access to care does not necessarily equate with better health, it is true that uninsured individuals are more likely to do without preventive care, delay needed care and thus experience more adverse health outcomes. In addition, when care becomes unavoidable, these individuals lack a medical



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home and are therefore forced to rely on local hospital emergency rooms for their health care needs. Not only does this system not provide the type of coordinated care best for the patient, it is also the most expensive form of health care for the community to provide. Even for those lucky enough to be insured, access to providers is limited, especially in the more rural areas of San Juan and Dolores Counties. This issue has implications for the energy sector. Not only is it difficult to maintain a healthy, productive workforce when there is a lack of access to care, but the increased cost of providing care becomes an issue for employers.

Other pressing health care issues for southwest Colorado include mental health and a significant aging population. According to CDPHE, suicide rates for La Plata and Montezuma have consistently exceeded the state average (data unavailable for other counties). Axis Health System (formerly Southwest Colorado Mental Health Center) is the largest non-profit mental health provider in the region, with facilities in three of the five counties. While there is enthusiasm in the concept of “integrated care” (i.e. integrating mental health care with primary care), at this time integrated care services are the exception rather than the rule. Seniors are the fastest growing segment of the population for the southwest region. At a recent community forum addressing health care issues for La Plata County, lack of healthcare facilities for seniors (including long term care, home health, and primary care providers that accept Medicare) emerged as one of the most critical issues facing us in the near future. Finally, in terms of leading causes of death, cardiovascular disease and cancer remain the two leading causes in every one the five counties in southwest Colorado (CDPHE). It is significant to note that smoking continues to be a significant causal factor for both cardiovascular disease and some types of cancer. Tobacco use (both cigarettes and chew) in rural areas in general and southwest Colorado specifically, is higher than the state average (CDPHE).

SB08-194, the Colorado Public Health Reorganization Act of 2008, requires all public health agencies in Colorado to “complete a local public health plan based on a comprehensive assessment of the community’s health and environmental status at a minimum of every five years”. La Plata and Archuleta Counties are currently conducting a joint Community Health Assessment (CHA); Montezuma & Dolores Counties will also complete a joint CHA by the end of 2012. San Juan County data is pending. The results of these assessments will help determine the public health priorities for each county for the next five years.

Research shows that many cancers, lung disease, and other chronic diseases are linked to environmental contaminants in our air, water and soil. How we extract, transport, and use energy is responsible for much of this pollution. Our past and present energy use is causing both known and unknown health impacts; our future use may have even more profound effects.

Health Impacts of Eight REAP GOALS:

- **Direct effects on environmental health which may directly influence human health:**



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- The environmental effects of conventional energy production have been well documented; new techniques such as hydrofracking may pose additional health risks. “Clean” energy development, for example solar, generally produces less air, water, and noise pollution, which all impact human health.
- **Direct effects on individual health:**
 - People who take transit walk more and are less obese than people who don’t.
 - Transit oriented communities tend to be more walkable, “livable” communities with lower obesity and chronic disease rates.
- **Indirect Effects on community, environmental, or individual health:**
 - Increased jobs and economic development from job creation in Renewable Energy, Energy Efficiency, and Resource Recovery fields which may lead to increased employment and job security, which in turn leads to improved physical and mental health. (<http://gom.sagepub.com/content/16/2/178.short>; http://www.phac-aspc.gc.ca/ph-sp/oi-ar/04_employment-eng.php)
 - Decrease in number of cars on road decreases air and ground water contamination, which can affect human health.
 - Decrease in number of vehicles on road (due to increased transit or active transportation) results in increased safety on roads.
 - Families who struggle to make ends meet and cannot pay their bills (including utility) experience increased levels of stress, depression, and domestic violence which all directly impact their health.
 - People who cannot afford or otherwise use cars and who don’t have access to transit, experience more stress, depression, difficulty accessing work, groceries, medical care, etc. (a transportation equity social justice issue).
 - Decreased number of vehicles on the road results in lower road maintenance costs and fossil fuel use in maintaining and building road/parking infrastructure thus potentially freeing public/government resources for public health needs or active transportation infrastructure (walking, bike riding) instead (which leads to improved community/individual health).
- **Indirect effects of not doing it or doing the opposite:**
 - Identifying energy loss leads to more energy available at lower cost which in turn allows more family income to be spent on essentials for health: food, water, housing, medical expenses.
 - Attempts to heat a house cheaply often leads to use of unsafe sources of heat: space heaters, ovens, barbecue grills, etc.
 - Energy audits often uncover other safety issues in heating systems leading to potential gas leaks, exposures, or other unsafe conditions.
 - Decrease in number of vehicles on roads (due to transit or active transportation) results in less fossil fuel used, theoretically making more available society-wide for essential needs: food, shelter, health, education, and medical care.
 - Less fossil fuels burned by individual homes/buildings leaves more for essential societal needs: medical care, food production, pharmaceuticals, other manufacturing, etc. that may be dependent on resources.



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- More resources recovered, especially those with a high embodied energy, leaves more fossil fuels and resources available for essential societal needs: medical care, food production, pharmaceuticals, other manufacturing, etc. that may be dependent on resources.
- Non-sorted landfills often result in air and water contamination with bacteria/viruses, toxins, heavy metals, methane, pests, etc.

Desired Projects Inventory

Note: This list is intended to be a dynamic working part of this document and will be updated as necessary. The projects outlined below align with the afore-mentioned Guiding Principles and S.M.A.R.T. Goals. The projects status are being tracked by an assigned 4CORE Community Energy Coordinator (CEC). The 4CORE CECs share potential resources and funding sources with project contacts to help facilitate project implementation.

Archuleta County

1. The town of Pagosa Springs is developing a business plan and request for bids for geothermal upgrades to their existing system. The goal is to update technologies to make the existing geothermal source as efficient as possible, with the potential result of heating more businesses and homes without affecting the flow or pressure to those currently using the geothermal source. The end result of this project could potentially establish a new geothermal utility for the town.
2. The town of Pagosa Springs is working to fund the installation of a community geothermal greenhouse to showcase the potential for geothermal development.
3. The town of Pagosa Springs is working to fund the installation of solar panels to power their geothermal pump house (in conjunction with item 1).
4. The Pagosa Springs Area Water and Sanitation District (PAWSD) is exploring the integration of renewables in order to power their facilities.
5. The town of Pagosa Springs and PAWSD are working to create a solar biosolids processing facility.
6. The Archuleta school district is working on a potential energy performance contract for existing facilities, as well as building new shared municipal facilities with a recreation center and ball fields. Ideas for this property also include an educational aquaculture facility and/or an educational greenhouse to serve the joint purpose of educating high school students and generating revenue.
7. A local resident is working on developing a solar array for the Pagosa area with energy storage capability for peak hour use. This new technology is for solar panels that can retain heat energy at night and store it for use on demand. The coordinator is looking for grants for land and panels.
8. Archuleta County would like to conduct proactive training for local contractors in new code implementation.



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9. Archuleta County would like to expand their transfer station and add a materials recovery center and a second-hand mercantile.
10. The Pagosa Springs Youth Center would like to weatherize their building and update their existing heating and lighting systems.
11. The Southwest Organization for Sustainability in Archuleta County would like to hire a part-time coordinator.
12. J.R. Ford, a private business owner, is developing a source for woodchip biomass fuel in collaboration with the forest service, near Pagosa Springs.

Dolores County

1. The School of Mines did a geothermal study in Rico in 2010/2011, finding high potential for geothermal applications, but recommending further analysis. Students will be back summer of 2012 to complete the study.
2. The Dove Creek Community Health Clinic is looking into solar thermal and solar PV applications.
3. Dolores County and the Town of Rico's Town Hall are both in need of energy assessments and upgrades. An energy assessment will be incorporated into an educational energy conservation presentation at the Rico Town Hall.

La Plata County

1. Phoenix Recycling, LLC and business partners are working to develop a regional Resource Recovery Park. This park would create new jobs and markets for recycled materials, increase the diversion of recycled materials from landfills and prevent greenhouse gas emissions.
2. A local realtor is planning to conduct training on new green fields and features in the MLS (Multiple List System). These features became active in our region in February 2011.
3. The GEO is working with 4CORE, Colorado Real Estate Network (CREN), and builders, energy raters and realtors in La Plata County to study the impact of ENERGY STAR New Homes (ESNH). The goal is to provide evidence for builders that ESNH has provided value in the home buying process.
4. KSUT is planning to move into a 5,000 square foot warehouse that is essentially a blank slate. They would like to build new studios that are both state-of-the-art and energy efficient, so are looking for funds to "green" the new building.
5. A group in Bayfield is looking to develop a Transition Town. The Transition Movement is a grassroots movement that seeks to build community resilience in the face of such challenges as peak oil, climate change and the economic crisis.
6. Animas High School is looking to move to a new location and would like to make their new building as "green" as possible.
7. Heartwood Farms in Bayfield is looking to develop a solar garden, but need funding and the availability of net metering.



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8. La Plata Electric Association is looking for seed money to develop a community solar garden.
9. La Plata Electric Association offers customers free electricity audits, and would like to develop a rebate program to encourage businesses to pursue energy efficiency retrofits recommended by the audit.
10. Healthy Community Food Systems is interested in developing designs and demonstration projects for three areas of energy efficiency in food and agriculture: 1) Innovative resource-efficient livestock watering freeze protection for small numbers of livestock, 2) Life-cycle-resource-efficient cool food storage for homes ranging from cold cellars to smart cool compartments, and 3) Solar food dehydrators with truly non-toxic materials and provisions for food safety.
11. The Smart Energy Committee would like to see local, distributed, renewable electrical generation in La Plata County.
12. The Sustainability Alliance of Southwest Colorado is pushing the City of Durango to consider banning single-use plastic bags.
13. Local First is looking at how they can influence or create policy that insures sustainable development. Specifically, they would like to push regulations that ensure the upcoming retail build in Grandview utilizes renewable energy, has minimal environmental impact, employs local contractors, incorporates green space and alternative transportation, etc.
14. To use lighting more efficiently, the Commons Building in Durango would like to retrofit parking lot lighting, install motion sensors in bathrooms and closets, and install dimmers in the conference room.

Montezuma County

1. RED Wagon Energy completed a grid tied, 88 kW solar system in Mancos with hopes to build more through a solar garden approach.
2. RE-1 school district in Montezuma County is applying for a BEST Grant.
3. RE-1 School district is working with an Energy Services Company, McKinstry, to conduct energy performance contracting services on many of the counties schools, as well as develop an educational curriculum for students and teachers.
4. Dolores schools are applying for a BEST Grant.
5. Empire Electric is getting ready to expand their solar garden, adding an additional 5kW to their existing 5kW. They have room for a third addition of 5 more kW.
6. Renew, Inc. is looking into a commercial energy audit.
7. The town of Mancos is working with the Governor's Energy Office to evaluate 2 of their municipal buildings for energy use and upgrades.
8. Baker Sanitation would like to expand their recycling services. They currently collect cardboard, metal, and paper due to an RREO (2011) grant and will need more money and customer support in order to expand.
9. The City of Cortez was awarded a Heart and Soul grant to improve their comprehensive plan and land use plan through community involvement. They will be applying for other grants to help facilitate this process.



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10. Southwest Colorado Community College is interested in collecting recyclable electronics from students and the public.

San Juan County

1. Silverton Chamber of Commerce and Youth Center are seeking funds for insulation and air sealing of the Historic Building in Silverton known as "The Visitors Center."
2. The Town of Silverton and San Juan County are using the Energy Management and Assistance Program in conjunction with Trident Energy and the Governor's Energy Office to improve the energy efficiency of their municipal buildings.
3. Kurt Johnson with Telluride Energy is working with Silverton on a small 9 kW micro hydro system.
4. Silverton is working on a downtown revitalization project, including changing out street lights for more efficient, yet historically-relevant, lights.

Multi-County Projects

1. Local electric utilities would like to conduct a CFL buy-down. (LPEA & San Miguel Power)
2. Employ technologies that pre-treat, filter, and temporarily detain stormwater in municipal, commercial, and residential projects in order to remove pollutants and restore pre-development hydrologic patterns to urbanized watersheds as pollution and water supply sustainability measures.
3. RainHarvest Solutions offers the TreePod biofilter, which captures municipal stormwater, providing large debris/garbage filtration and biofiltration of nutrients and other stormwater related pollutants. Collected flows may be utilized to supplement irrigation of the TreePod and surrounding vegetation, reducing demands on local water supplies. Any infrastructure upgrade project would be an opportunity to explore innovative solutions to stormwater management and water conservation.
4. RainHarvest Solutions offers the CUDO stormwater management system which provides underground stormwater detention, filtration of municipal snow stockpile effluent water, and many other water quality and water supply applications that require modular water storage, infiltration, and filtration services to enhance water quality and water supply sustainability.

Completed Projects since January 1, 2011:

- ✓ The West Building in Durango was retrofitted with efficient lighting.
- ✓ The Town of Ignacio converted their street lights to LED using fixtures that match current lights. The Durango Discovery Museum has insulated and sealed the museum building and installed solar PV, solar thermal, and geothermal. They also participated in regional energy efficiency and renewable energy assessments and planning for sustainable community and building design. This will be integrated into the museum building/exhibits.
- ✓ The historic Smiley Building has insulated their attic.



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- √ Empire Electric Association (EEA) installed a 5 kw solar garden (24 panels) for customers who want to support RE.



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Appendix A: Advisory Board

Name		County	Organization/ Expert Area
Laura	Lewis Marchino	All	Region 9 Economic Development District (EDD)
Ed	Morlan	All	Region 9 EDD
Denise	Rue-Pastin	All	Southwest Water Conservation District (SWCD); Southwest Organization for Sustainability (SOS)
Jimbo	Buickerood	All	San Juan Citizens Alliance (SJCA)
Bruce	Baizel	All	EARTHWORKS
Chloe	Wiebe	All	Workforce Development
Jennifer	Stark	All	Higher Education, Community Learning & Research, Fort Lewis College, Rico Planning Commission
Bob	Bragg	All	Higher Education, Southwest Colorado Community College (Mancos, Durango)
Julie	Simmons	Multiple Counties (La Plata, Archuleta, Montezuma, San Juan)	Colorado Housing, Inc.
Barbara	Jefferies	Multiple Counties: La Plata, Archuleta	La Plata-Archuleta Cattleman's Association
Wayne	Semler	Multiple Counties: La Plata, Archuleta	La Plata-Archuleta Cattleman's Association
Kyle	Beebe	Multiple Counties: La Plata, Archuleta	La Plata-Archuleta Cattleman's Association
Jake	Nossaman	Multiple Counties: La Plata, Archuleta	La Plata-Archuleta Cattleman's Association
Tom	Talley	Multiple Counties: La Plata, Archuleta	Woolgrowers Assoc. and Farm Bureau
Jeff	Berman	Multiple Counties: La Plata, Archuleta	La Plata Electric Association
Pam	Patton	Multiple Counties: La Plata, Archuleta	La Plata Electric Association
Jeff	Engman	Multiple Counties: La Plata, Montezuma	ConocoPhillips
Brad	Broyles	Multiple Counties: All but San Juan (note: no bank in San Juan)	First Southwest Bank
Bill	Green	Multiple Counties: Dolores (Rico), San Juan (Silverton)	San Miguel Power Association, Inc.
Bob	Clayton	Multiple Counties: La Plata, Montezuma	Kinder Morgan
Jerry	Fetterman	Multiple Counties: Montezuma, Dolores	Empire Electric Association
Doug	Sparks	Multiple	Empire Electric Association



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Name		County	Organization/ Expert Area
		Counties: Montezuma, Dolores	
Michael	Whiting	Archuleta	Southwest Land Alliance, Archuleta County Commissioner Candidate
Clifford	Lucero	Archuleta	County Commissioner
Ross	Aragon	Archuleta	Mayor of Pagosa Springs
James	Dickhoff	Archuleta	Staff: Pagosa Springs
Mat	deGraaf	Archuleta	Pagosa Area Water and Sanitation District
J.R.	Ford	Archuleta	Biomass electrical generation plant
Julie	Kibel	Dolores	Elected Official
Barbara	Betts	Dolores	Rico Elected Official
Christina	Rinderle	La Plata	Durango Elected official, LEAD: La Plata Economic Development Action Partnership
Jeanine	Justice	La Plata	Healthy Lifestyles La Plata
Peter	Diethrich	La Plata	Southern Ute Indian Tribe
Terry	Fitzgerald	La Plata	Agriculture affiliate
Heather	Erb	La Plata	Real Estate
Greg	Fryback	La Plata	Real Estate
Terry	Woodward	La Plata	SME: People-Planet-Profit
Tyler	Scheid	La Plata	SME: Water shed
Werner	Heiber	La Plata	Sustainability Alliance of Southwest Colorado (SASCO)
Paul	Senecal	La Plata	town of Ignacio
Jodi	Foran	Montezuma	Montezuma Climate Action Network, SW Memorial Hospital Board and NEEP team
Matt	Keefauver	Montezuma	Cortez Elected Official
J	Felton	Montezuma	Bill Barrett Corp.
Becky	Levy	Montezuma	Town of Mancos
Jim	Foster	Montezuma	Bill Barrett Corp.
Scott	Clow	Montezuma	Ute Mountain Ute Tribe
Tomoe	Natori	Montezuma	Ute Mountain Ute Tribe
Chris	Barber	Montezuma	Dolores Elected Official
John "Jack"	Schuenemeyer	Montezuma	Chamber of Commerce Also: SME: statistics consulting firm and author, Let It Grow Nursery owner
Gretchen	Fitzgerald	Montezuma	USDA, San Juan National Forest
Mitchell	Toms	Montezuma	Economic Development Association
Trevor	Lytle	Montezuma	Home Builders Association
William	Tookey	San Juan	County Staff
Dave	Zanoni	San Juan	Silverton Elected Official
Jason	Wells	San Juan	town of Silverton staff