

Lafayette Clean Energy Recommendations

Introduction

The City of Lafayette currently has a goal to reduce the city's greenhouse gas (GHG) emissions by 20% from 2007 levels by 2020. This goal was established in the 2009 City of Lafayette Energy Sustainability Master Plan, a high-level look at energy use and at strategies to reduce it, written by the Lafayette Energy Sustainability Advisory Committee (LESAC). Reasons to reduce our use of fossil fuel-based energy are numerous. ***(Appendix A)***.

According to data recently acquired from our energy utility, there has been only a slight decrease in energy use in Lafayette since 2007; significant expansion of our energy sustainability efforts is needed in order to meet the 20% GHG reduction goal by 2020.

The Lafayette Clean Energy stakeholders group formed to investigate specific ways to accelerate reduction of our GHG emissions. To that end, we have done research and held discussions with experts in various fields as well as with city staff.

Recommendations presented here focus on bringing the benefits of energy efficiency (EE) and renewable energy (RE) to the residents and businesses of Lafayette, with the initial focus on reducing building energy use. The city already has the knowledge and financial savvy to continue bringing EE and RE upgrades to municipal facilities.

The purpose of this document is to present the case for placing a question on the 2014 ballot to raise dedicated new funds for energy sustainability efforts, and to form the Lafayette Clean Energy Commission to manage these funds and other revenue produced by new energy-related partnerships ***(Appendix B)***.

The City of Lafayette can facilitate reaching our energy goals while providing beneficial services to residents and businesses, creating local jobs, keeping energy dollars closer to home, and generating income for the city, all by elevating energy sustainability to a higher priority.

Executive Summary

This report summarizes an approach to achieve or even exceed a 20% reduction in our GHG emissions by 2020, with details presented in appendices. The highlights include:

- Build upon the foundation of LESAC's past and present efforts to address Lafayette's energy use and GHG emissions
- Leverage and build upon the services and experience of existing energy efficiency organizations that are already available to Lafayette residents and businesses ***(Appendix C)***
- Institute vigorous, sustained public outreach and energy education ***(Appendix D)***
- Create partnerships with private companies to address GHG emissions while creating revenue ***(Appendix E)***
- Hire an energy expert to manage sustainability efforts ***(Appendix F)***
- Create new EE programs in addition to enhancing existing ones ***(Appendix L)***

To enable these energy sustainability solutions, we recommend that City Council place a question on the 2014 ballot (*see Appendix B*). The highlights are:

- **Institute a 2% Energy Excise Tax**
 - o To be collected on the sale of electricity and natural gas
 - o To raise approximately \$480,000 in the first year
 - o To be used for programs that substantially reduce Lafayette's GHG emissions

- **Create a 7-9 member Lafayette Clean Energy Commission**
 - o Empowered to design, direct and oversee energy sustainability efforts
 - o Created by Ordinance with prudent checks and balances

Energy Efficiency and Renewable Energy

The adoption of energy efficient behaviors is the most cost-effective way to reduce GHG emissions. Implementing energy efficient technologies in addition to forming wise energy habits creates a solid foundation for GHG emission reductions. Illustrations of the cost effectiveness of energy efficient equipment are shown in *Appendices M and N*.

Renewable energy technologies are rapidly advancing; many are already cost competitive over their expected lifetimes and more are in the pipeline. For example, solar PV, ground-source heat pumps and solar thermal technologies all reduce fossil fuel-based energy use. By first employing energy efficiency strategies, RE systems can be smaller and cost less.

To measure our progress on GHG reduction, we will need to acquire and analyze suitable data. (*Appendix H*).

Partnerships

Partnerships That Require Public Funding (Appendix C)

Existing energy efficiency programs already possess significant institutional knowledge concerning outreach and education, energy auditing, prioritizing EE/RE actions, process facilitation, and financing. Leveraging these programs should be a primary goal. Two such potential partners are the Boulder County EnergySmart and Longs Peak Energy Conservation programs. Longmont and Boulder have shown that enhancing EnergySmart incentives can dramatically increase participation in these programs.

Revenue Potential for Lafayette (Appendix E)

We have investigated promising public-private clean energy partnerships, such as ground-source heat pump projects and bulk-purchases of LED lighting. Such business opportunities would bring third-party investment to Lafayette and would generate revenue. We strongly recommend that the city implement repayment capability on municipal water bills (similar to trash/recycling) to lower costs and to simplify repayment to corporate partners..

Public Funding Needs

Dedicated funding from the ballot is needed for public outreach and energy education, for energy advising and energy upgrade incentives, and for a likely new staff hire (*Appendix F*). Enhanced incentives are already available for income-qualified residents, and these could be supplemented (*Appendix I*).

Public Outreach and Energy Education (Appendix D)

Creative, comprehensive and sustained public outreach and energy education are fundamental to reducing our use of fossil fuels. We need to create a culture of resource awareness and action in Lafayette, while emphasizing comfort, health, safety and cost savings in addition to environmental concerns in our messaging.

The city is in a unique position to reach all residents and businesses by regularly providing information through water utility billing, newsletters, a dedicated website and other online tools. Effective messaging can also occur through service organizations, schools, social groups and HOAs.

We estimate an outreach budget of \$40,000/year for occasional city-wide mailings, signs and banners, and other outreach efforts.

Financial Incentives (Appendix K)

- [remove space]Free energy advising for all residents
 - o \$50,000/year to reach 10% of households per year
 - o Energy advising is already free for businesses through EnergySmart
- Residential subsidies
 - o \$300,000/year estimated to reach 10% of households
 - o Emphasis on building envelope, lighting, AC, refrigerators
- Commercial subsidies
 - o \$100,000/year estimated
 - o Emphasis on lighting, building envelope, equipment
- Enhanced incentives for multiple actions to encourage deeper retrofits

Financing Options (Appendix G)

Lafayette should seek to leverage existing financing tools before considering creating its own; however, we strongly recommend implementing on-bill repayment for third-party financing.

The total budget estimate for outreach, incentives, new hire salary and possible new financing programs substantially exceeds the revenue from a 2% Energy Excise Tax. The Lafayette Clean Energy Commission would be tasked with prioritizing expenditures, in addition to directing new revenue produced by public-private partnerships.

Business Considerations (Appendix J)

Interviews with Lafayette business owners indicated that their concerns include cost savings, environmental responsibility, a “green” image for their business, employee comfort and having comprehensive sustainability information readily available in one place.

The most effective outreach method for businesses is personal contact. Efforts should be made to bring attention to current programs as well as to enhanced incentives through new programs that are available to every business in Lafayette.

Ballot Question Recommendations

- Seek dedicated public funding for portions of this comprehensive, aggressive energy sustainability program.
 - o We recommend instituting a 2% Energy Excise Tax to be collected on energy bills; this approach taxes the behavior (energy consumption) that we want to minimize, and appropriately invests the tax toward reducing the energy use of the residents and businesses of Lafayette.

- Direct that a 7-9 member commission be created by ordinance and charged with:
 - o Managing public EE/RE funds with minimal, prudent checks and balances
 - o Seeking, vetting, and overseeing public-private partnerships
 - o Overseeing the management of revenue from public-private partnerships
 - o Coordinating with and enhancing existing energy efficiency programs
 - o Setting policy and direction on energy sustainability
 - o Directing vigorous outreach and public education efforts
 - o Designing and promoting new municipal EE regulations

Further details can be found in **Appendix B**.

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Appendix A

The Need To Move Beyond Fossil Fuels

It is an underlying assumption of this report that transitioning from fossil fuels to clean energy (energy efficiency and renewable energy) is important and desirable enough to warrant making it a higher city priority and a city service. Still, a few words of justification are in order.

There are both economic and environmental reasons to reduce our energy obtained from coal, oil and natural gas, first by decreasing the total amount of energy we need through energy efficiency, and then by using renewable energy for the rest.

- Energy efficiency (better refrigerators, air conditioning, lighting, windows, insulation, etc.) is an investment that pays for itself over time in energy savings, and also supports local clean energy jobs. Residents with lower energy bills have more money to circulate locally. Businesses with lower energy bills are more profitable and help Lafayette attract new businesses.
- Xcel forecasts that electricity rates will increase for decades to come [A1]. The cost of coal has been increasing [A2], and it will rise more rapidly as new pollution regulations come into effect, and even more so if a carbon tax is enacted [A3]. Meanwhile, the cost of renewable energy is decreasing rapidly, and solar is expected to be at cost parity with grid power, without subsidies, by 2020 [A4]. By promoting energy efficiency and renewable energy the City can do us the awesome service of protecting our pocketbooks.
- Coal-burning power plants emit harmful pollutants (mercury, sulfur and nitrogen oxides, soot), which cause health impacts and economic damage.
- Natural gas production via hydraulic fracturing injects unknown chemicals into the ground and consumes millions of gallons of precious water per well.

- Cooling of thermal power plants (coal, gas, nuclear) uses enormous quantities of fresh water [A5], which will increasingly compete with agricultural and residential uses.
- Carbon dioxide emissions from burning coal are the primary cause of global warming. Natural gas produced via hydraulic fracturing is about as big a contributor as coal (per megawatt) due to the leakage of methane, a powerful greenhouse gas [A6]. For an introduction to the science and impacts of global warming, please see "Global Warming in a Nutshell" [A7].
- The urgency of the need for action to address climate change and get off of fossil fuels soon is well-described by respected climate scientist Richard Somerville [A8].
- Bottom line: We are responsible for the climate that we leave to future generations.

The best way to oppose spending our energy dollars on keeping old coal plants operating and on fracking for natural gas is simply to buy less energy produced from fossil fuels, which we can do by seriously promoting energy efficiency and renewable energy.

Appendix A References:

[A1] <http://lafenergy.org/figures.php#xcelrates>

[A2] <http://lafenergy.org/figures.php#coalcost>

[A3] <http://www.nytimes.com/2013/12/05/business/energy-environment/large-companies-prepared-to-pay-price-on-carbon.html>

[A4] <http://lafenergy.org/energylinks.php#gridparity>

[A5] http://www.ucsusa.org/clean_energy/our-energy-choices/energy-and-water-use/freshwater-use-by-us-power-plants.html

[A6] <http://www.skepticalscience.com/fracking-and-methane.html>

[A7] <http://lafenergy.org/ms/essays/gw.php>

[A8] <http://thebulletin.org/climate-change-irreversibility-and-urgency>

Appendix B

Ballot Question Recommendations

Summary Recommendation

Portions of the energy plan require dedicated public funding. We recommend asking voters for a 2% Energy Excise Tax for a period of 10 years, collected on energy bills by Xcel. This will generate about \$480K in Year 1 (minus any Xcel service charge).

Lafayette's overall energy sustainability effort and associated budget should be directed by a Commission ("Lafayette Clean Energy Commission", LCEC) that embodies relevant expertise, is invested with considerable independence, and is enabled to manage both public and private funds as well as municipal revenue generation. The characteristics of the Commission should be set out in the ballot question (proposed ballot question below).

More than \$480K/year could productively be used toward reaching our clean energy goals. A 2% energy tax was our judgment as to how much the voters will bear (*Appendix K*). The LCEC will prioritize expenditures.

Characteristics of the Proposed Lafayette Clean Energy Commission

- **Reports to City Council** per City Charter Sec 4.13. The Commission should use city staff and services such as Administration, Finance, Auditors, Insurance, HR, Legal, etc.
- **High degree of independent decision-making**, similar in many ways to the Planning Commission (Charter Sec 4.14), except Advisory rather than Quasi-judicial. In order to enable the LCEC to act in a timely manner, we suggest that LCEC only be required to seek specific endorsement from City Council for larger expenditures (such as any single expenditure exceeding 50% of annual public funding) or for contracts such as PPAs or public-private partnerships.
- **Membership and Term.** 7-9 members appointed by City Council from applicants based on relevant expertise, nominally serving a 4-year term, with initial terms staggered such that no more than 2 members' terms expire at the same time.
- **Meets twice monthly.** The meeting schedule should differ from City Council's schedule.
- **Responsibilities and Duties.** The Commission should set policy and direction on energy sustainability, with some checks and balances with City Council. City Charter Sec 4.13-1 states that the ordinance establishing a Commission should indicate the "selection, term, policies, responsibilities, and duties" of the Commission. These characteristics should appear in the full ballot language.

Proposed Content of Ballot Question

- This represents the full ballot question, whereas voters will see only a summary "ballot title".

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Shall City of Lafayette taxes be increased by \$480,000 in the first year and annually thereafter for 10 years by assessing a new 2% Energy Excise Tax that is collected on energy bills, and

shall these funds be dedicated to significantly accelerating the adoption of energy efficiency and renewable energy by the residents and businesses of Lafayette, for such purposes as:

- Leveraging existing energy efficiency and renewable energy ("clean energy") programs, and existing financing programs;
- Implementing new clean energy and financing programs;
- Instituting strong public outreach and education measures to help citizens take advantage of opportunities to reduce their energy consumption, save money on their energy bills, and increase comfort and security;

and in conjunction with these new energy sustainability efforts, shall the city

- Create by Ordinance a Commission ("Lafayette Clean Energy Commission") consisting of 7-9 members who are Lafayette residents but may include up to two resident or non-resident representatives of Lafayette businesses, selected by City Council from applicants based upon their expertise in relevant areas, who will then select their own Chair to serve a one year term with eligibility for re-election; and
- Charge this Commission with managing public funds from the energy excise tax as well as facilitating opportunities and managing funds associated with clean energy public-private partnerships and related revenue generation; evaluating clean energy programs and opportunities and recommending their adoption by City Council; directing program implementation; directing outreach and public education efforts; establishing energy sustainability goals and metrics for measuring progress and periodically reporting on progress to City Council; and ensuring that programs using public money benefit Lafayette residents and businesses (not municipal projects); and
- Any other elements that should be specified?





## Appendix C

### Existing Energy Efficiency Programs

Lessons and Recommendations are taken from the [Colorado Better Buildings Project](#) report [1], websites of the Boulder County EnergySmart program [2] and Longs Peak Energy Conservation program [3], and conversations with Boulder County sustainability personnel.

#### **Summary Recommendation**

Lafayette would benefit from promoting and expanding upon existing energy efficiency programs. We should leverage the years of experience, program refinement, partnerships, external funding, consultant studies, data collection and tracking, and branding that programs such as EnergySmart and Longs Peak have developed.

We recommend promoting programs with targeted and sustained public outreach, and subsidizing Energy Advising and certain energy efficiency upgrades on an income-based sliding scale to incentivize high participation rates as described in *Appendix J*.

Lafayette should consider supporting the County sustainability initiative so that EnergySmart and income-qualified weatherization stay strong. It would be a shame to diminish these well-developed programs just when we are finally positioned to get our fair share of them.

Lafayette should consider passing rental regulations similar to Boulder's SmartRegs to address the owner/tenant split incentive and drive greater participation in energy efficiency programs.

#### **About EnergySmart and Longs Peak**

EnergySmart (ES) is a Boulder County program that began in Jan 2011 with \$12M in ARRA funding. Its concept originated with Boulder's 2006 Climate Action Plan (CAP). ES drives high participation rates in residential and commercial energy efficiency upgrades by overcoming barriers to action and by using a successful Energy Advisor model (70% of participating residents and 33% of businesses complete energy upgrades). ES also aims to create local jobs, support local economic development, and leverage grant and public funding to stimulate private investment in energy efficiency. ES has been especially successful in cities that have engaged in strong public outreach and have incentivized energy advising and upgrades with municipal funds, namely Boulder (CAP tax funds) and Longmont (general funds plus grant funds). A key objective of ES is to establish new social "norms" around energy efficiency.

The Longs Peak Energy Conservation (LPEC) weatherization program is operated by Boulder County Housing and Human Services [3], and has existed for over 20 years. It is independent of ES but works closely with ES, especially on income-qualified weatherization services.

#### **Overcoming Key Hurdles to Action**

- **The Energy Advisor model** is central to achieving high participation rates. Advisors work one-on-one with participants to assess their personal goals. They then assist in identifying, prioritizing, and implementing energy efficiency projects, including finding contractors and reviewing bids, applying for available incentives/rebates from all sources, arranging financing if needed, and in general reducing the time and hassle involved in making energy upgrades. Advisors are seen by customers as trusted, unbiased, third party consultants.

- **Contractor database.** ES maintains a database of vetted contractors and periodically verifies that their work meets high standards. Lack of trusted contractors is a key barrier. Lafayette should encourage local contractors to sign up with ES, which would enhance local jobs and keep more dollars circulating in Lafayette.
- **Contractor training.** ES provides contractor training workshops to improve technical and marketing skills. Local residents now look to ES contractors for high quality service.
- **Financing.** Two financing mechanisms (PACE, microloans) were used in the past to overcome the key barrier of upfront cost. Currently, long-term access to capital has been secured through Elevations Credit Union, backed by a loan-loss reserve. Lafayette could consider additional financing options as described in *Appendix G*.
- **Rebates.** In addition to incentives from County and Xcel programs, city-level incentives further decrease payback times. This approach has increased participation rates in Boulder and Longmont. Commercial rebates are designed to fill gaps in Xcel's rebate list, raise certain efficiency requirements above Xcel's, and set rebate levels to cover up to 70% of costs for lighting upgrades and 50% for HVAC projects when combined with utility rebates. County residential rebates are currently a certain dollar amount per implemented measure up to a cap (\$250 or \$500 per measure up to a total of \$1000 per household); these are supplemented by utility rebates and city-level rebates in Boulder and Longmont.
- **Outreach.** ES and other programs have developed dozens of outreach strategies to increase awareness of the benefits of energy upgrades (comfort, health and safety, reduced energy bills), and how simple it is to participate. Research indicates marketing efforts should move away from purely environmental messaging to more universal wants and basic desires, with environmental benefits as a bonus. Reaching out through trusted sources is an effective outreach strategy. Special ES outreach projects have targeted HOAs and large property owners. See *Appendix D* for more on Outreach and Energy Education.
- **Innovative business program.** The 3 levels of participation in the ES program are: 1) free energy assessments to identify energy- and cost-saving opportunities; 2) an "optimize" option to increase the efficiency of existing refrigeration, HVAC, and air compressor equipment that is not at the end of its life or the business may not be able to invest in new capital equipment; and 3) energy upgrades, including available rebates and financing.
- **Income-qualified ES and LPEC programs.** In addition to incentives and low-interest financing available to all ES participants, the ES and LPEC programs collaborate on two income-qualified programs as described in *Appendix I*. Lafayette should engage in extensive targeted outreach to claim these available resources for our citizens.
- **Boulder's SmartRegs Ordinance.** This ordinance requires all rental housing to meet basic energy efficiency standards by 2019. Lafayette could adopt a similar ordinance to help address the owner/tenant "split incentive" hurdle, and incentivize energy upgrades in this category of buildings.

**Public funding needs** for outreach and for subsidizing/incentivizing residential and commercial energy advising and energy upgrades is discussed in *Appendix K*.

## **References**

[1] <https://drive.google.com/file/d/0BxYo3pm6gdMLakJSTVBkTVJXaTg/edit?usp=sharing>

[2] <http://www.energysmartyes.com/>

[3] <http://www.bouldercounty.org/family/housing/pages/lpeceatherization.aspx>

## Appendix D

### Public Outreach and Energy Education

#### **Summary Recommendation**

We recommend promoting Lafayette clean energy programs and opportunities with massive and sustained public outreach and energy education. Energy efficiency professionals state that enhanced outreach efforts are essential to increasing participation rates in EE/RE programs.

Public outreach and energy education fundamentally underlie any effort to reduce fossil fuel use. People must understand the why, what and how of using energy more efficiently to fulfill needs such as refrigeration, providing light and maintaining a healthy home, while recognizing that energy efficiency can also make them more comfortable, promote health and wellbeing, and save money.

**Bilingual materials.** Given the diversity of the Lafayette community, materials and information should be available in English and Spanish as much as possible.

#### **Primary messages for effective outreach, in order of relative importance**

This prioritization and other lessons have been gleaned from the outreach efforts of existing energy efficiency programs (*Appendix C*).

- Comfort
- Health
  - Home health due to better air quality and temperatures, especially in winter
  - Public health from cleaner water, air, and soil with less fossil fuel use
- Reduced energy bills
- Ease of the entire energy upgrade process
- Ease and low cost of energy advice/audits
- Ease of finding best, most cost-effective solutions
- Substantial subsidies/incentives, some available on an income-based sliding scale
- Ease and availability of financing
- Ease of finding qualified and trusted contractors
- Friendly competition with friends and neighbors to use less energy
  - Bring attention to new Xcel online account comparison to neighbors
- Tangible action on climate change and other environmental concerns

#### **The City can help increase energy awareness and program participation rates**

- The city is a trusted source of information
- We already distribute information to all residents in both physical and electronic forms
- Frequent distribution of well-designed energy education and available program materials can contribute to a new culture of energy awareness in the city

## **Reaching out to organizations such as these is an effective outreach strategy**

- Sister Carmen
- The Senior Center
- Home Owner's Associations (HOAs)
- Larger businesses
- Social clubs and groups
- Schools

**Energy Advisors.** Once residents and businesses have connected with energy advisors, much targeted information can be shared and assistance given. The key is to bring energy advisors to the attention of residents and businesses, and help them understand how they can benefit. Free energy advising is an important incentive to start the process.

**Contractors are an essential element.** According to the Colorado Better Buildings Project report, face-to-face contact with contractors was found to be the most effective way to initiate EE/RE actions by homeowners. The city could enhance existing training programs for contractors by partnering with local businesses and by encouraging local contractors to participate; these contractors might then appear on a list of recommended Lafayette contractors, adding to the local tax base. The same report notes that door-to-door contact with businesses is the most effective outreach method.

**Door-to-door for businesses.** The same report notes that door-to-door contact is the most effective outreach method for businesses.

**Outreach through media.** A critical component of comprehensive outreach and education efforts is a dedicated, comprehensive website. It should address important local issues and promote local contractors who have been certified for EE/RE projects. Other media should also be used – articles in newspapers, etc.

## **Examples of local energy sustainability websites - an important outreach strategy**

- Garfield Colorado Clean Energy Collaborative: "One Stop Shop website [garfieldcleanenergy.org](http://garfieldcleanenergy.org) is a directory of resources for taking action. Information on rebates, contractor listings, legislation, events and how-to advice on topics from electric vehicles to heat tape."
- Midcoast Green Collaborative website [midcoastgreencollaborative.org](http://midcoastgreencollaborative.org) (Maine) is similar. Also DIY workshops are sponsored by local businesses, government and enthusiasts.

## Appendix E

### Public-Private Partnerships and Revenue Generation

#### **Summary Recommendation**

Lafayette should pursue public-private partnerships that allow us to use "other people's money" to make substantial progress on focused clean energy opportunities. In most cases such partnerships will generate revenue. Such opportunities should be vetted and managed by the proposed Lafayette Clean Energy Commission. Staff time would be needed to seek out, evaluate, manage and track progress on such programs.

Lafayette should implement on-bill repayment (like trash/recycling) to simplify repayment of third-party financing by customers, and to attract private sector partners and third party investment.

**Two Models for Partnerships.** Described below are two potential private partnerships, one offering geothermal energy and the other offering LED lighting; a third on solar thermal is also promising. Other opportunities will certainly arise as Lafayette's commitment to major clean energy projects becomes more widely known, and as additional EE/RE technologies mature.

**RFP generally required.** Although opportunities will usually present themselves individually, in most cases the City will need to put out a Request for Proposals (RFP) to ensure competition for a program of specified characteristics. This restriction may not apply to pilot projects.

**On-Bill repayment.** It is desirable to extend the current on-bill payment capability for our trash/recycling contractor to public-private clean energy opportunities, for several reasons:

- Helpful and cost-reducing for private parties to receive a single check from the City.
- Convenient for residents and businesses to receive new services without receiving a new bill.
- The term of the payments can be designed to equal or exceed the payback period of the energy saving investment so that businesses and residents immediately have a net zero or slightly positive cash flow.

#### **Geothermal Heating and Cooling**

- We heard from a geothermal startup that placed highly in a recent business plan competition for its plan to facilitate widespread cost-effective adoption of geothermal energy. This company did much of the design work for the extremely successful Josephine Commons ground-source heat pump heating and cooling system.
- Their financial model provides geothermal energy at no upfront cost to customers or the City, with repayment over time on City water bills.
- Geothermal is renewable energy that replaces natural gas for heating, and reduces electrical cooling costs due to the extremely high efficiency of ground-source heat pumps.
- A pilot project of some 20 varied participants in Lafayette is sought to test their business model for later ramping up to a goal of 200 new geothermal loops per year. Very favorable terms are proposed to entice Lafayette to participate in such a pilot.

- Revenue generation - the City would receive a fee for using its right-of-way to drill geothermal wells.

### **LED Lighting Retrofits**

- We heard from a Boulder County entrepreneur who described a proposal to bring low-cost and high-quality efficient LED lighting to residents and businesses, substantially reducing our electricity consumption.
- This money and energy saving technology has a quick payback time and may be used to attract attention to broader energy efficiency upgrades.
- Revenue generation - the City could receive a fee for offering a letter of credit to the vendor to guarantee sales of a bulk purchase.

## Appendix F

### Energy Expert to Manage Programs

#### **Summary Recommendation**

Current City Staff could manage some new tasks, but the broad and often technical options being considered suggest that a new hire with energy expertise and competence in finance be tasked with managing the overall energy sustainability effort in Lafayette. We recommend using public money from the ballot for salary, with benefits and overhead coming from the General Fund given that the hire will likely also work on municipal energy projects.

#### **Characteristics of the position, and needed public funding**

- **Energy expert** with relevant education and professional experience. Finance knowledge desirable.
- **Salary.** Commensurate with needed expertise and experience.
- **Benefits, overhead.** The City could absorb this into General Fund expenditures given that the hire will likely also contribute to municipal energy sustainability projects.

#### **Some potential job responsibilities** (this is an overview, NOT a job description)

- **Oversee Lafayette energy sustainability efforts**
  - Coordinate between Administrator/Staff, LESAC, program leads, Stakeholders group, Lafayette Clean Energy Commission (i.e., the governing body)
  - Seek grant opportunities and matching funds
  - Coordinate with existing or new EE/RE programs.
  - Oversee/conduct outreach efforts (individual business contacts, design materials, etc.)
  - Collect program performance data and provide regular progress reports.
- **Seek and evaluate new programs** for the City to consider. Examples:
  - Public-Private partnerships (GHP, LED, solar thermal and others)
  - Municipal performance contracts and PPAs
  - Parallel utility for big energy users like the Medical Center
  - New possibilities that will constantly arise, such as pumped-heat or battery energy storage at City and commercial facilities for peak-shifting/shaving and reduction of demand charges.
- **"Who ya gonna call?"** (movie reference)
  - Many programs in Lafayette means many questions from residents and businesses. Who will answer them if not a designated person who is an expert on energy and programs?

## **Appendix G**

### **Financing Options**

#### **Summary Recommendation**

Some residents and businesses need low-interest financing to overcome the hurdle of upfront cost. There are existing clean energy finance programs available that meet some needs.

Third-party financing will be available through some public-private partnerships. Lafayette should implement on-water-bill repayment to facilitate these.

There may be good reasons to establish a revolving loan program and/or a PACE program, but it is premature (and also unnecessary) to make a firm recommendation at this time. Both programs would require public funding and Staff time to set up and manage.

The ballot question should be written with enough flexibility that public funds can later be apportioned between energy efficiency incentive programs and any new financing options.

#### **Existing Clean Energy Finance Programs**

- The EnergySmart program established low-interest loans through Elevations Credit Union by providing a loan-loss fund. It has a fairly low minimum credit score requirement of 580. This program may meet the needs of projects undertaken through the ES program.

#### **Third-Party Financing**

- Some Public-Private Partners bring terms such as zero down and low-interest financing (see *Appendix E*).
- Lafayette should implement on-water-bill repayment to facilitate and simplify payments for residents, businesses, and the private partner (among other possible uses).

#### **Possibility #1: Establish a low-interest revolving loan fund**

- Seed it by bonding public money from the ballot (\$0.5-1M, then more if uptake is high).
- Should be self-sustaining (interest income compensates for low rate of anticipated defaults).
- Advantages: applies to non-ES programs and is independent of ES; helps people with lower credit scores or can use payment history rather than credit score as a qualification metric; more convenient for customers if coupled with on-water-bill repayment.
- Disadvantages: a lot of work to set up; experience suggests low uptake (may not be worth it).

#### **Possibility #2: Establish a PACE (Property-Assessed Clean Energy) program**

- Backstop with a loan-loss fund by bonding public money (\$0.5-1M; more if uptake is high).
- Easier to implement for commercial customers, but possible for residents too.
- Appropriate for long payback timeframes because the debt is transferred when the property is sold, so the disincentive of investing for the benefit of a future owner disappears.



## Appendix H

### Baseline Data and Metrics to Measure Progress

#### **Summary Recommendation**

Obtain baseline electricity and natural gas consumption data for Lafayette from Xcel, organized by sector, monthly data if possible, for the past several years and annually in the future.

Records should be kept on program participation numbers and energy upgrade actions taken as an additional means of measuring progress (in addition to changes in per capita energy use).

LESAC produced a Lafayette greenhouse gas inventory for the year 2007 that is reported in the City of Lafayette Energy Sustainability Master Plan [1]. We discussed commissioning an updated thorough greenhouse gas inventory as a baseline against which our progress will be measured, but rejected the idea because:

- It is expensive
- Complexity and inaccuracy arises from estimating transportation energy, which is not a focus of our carbon-reduction efforts at this time.
- Programs being discussed are almost all aimed at reducing building energy, so it makes most sense to acquire and track data on our consumption of electricity and natural gas.

#### **Baseline Energy Consumption Data**

- LESAC is already making progress on obtaining baseline energy consumption data from Xcel.
- Data should ideally be partitioned by sector (residential, commercial, industrial, municipal, streetlighting), including the number of customers in each sector so that average ("per capita") consumption can be calculated. Finer partitioning (such as by neighborhood) is desirable but not essential.
- Data should ideally be monthly, and cover several recent years.
- Data updates should be obtained annually if possible.

#### **Metrics to Measure Progress**

- Average ("per capita" or "per entity") consumption of electricity and natural gas, by sector, from analysis of the above data.
- Participation numbers and rates for programs, with a focus on energy upgrade actions taken (these factors are already tracked by the EnergySmart program). Estimates of GHG reduction can be translated from participation and upgrade data.

[1] <http://www.cityoflafayette.com/DocumentCenter/View/2587>

## Appendix I

### Strategies for Income-Qualified Residents

#### Summary Recommendation

We recommend specifically targeting households with lower or fixed incomes for outreach and enhanced incentives. Income-qualified energy efficiency programs already exist and should be leveraged to the fullest in Lafayette.

We also recommend enacting a Rental Ordinance to address the owner/tenant "split incentive". This would be particularly helpful for residents with lower or fixed incomes, but also has broad benefits for all renters and for reaching our GHG reduction goals.

This Appendix collects and enhances points made throughout the Report about overcoming barriers to action on clean energy for residents with lower or fixed incomes. This is important for a variety of reasons, including:

- Residents with lower or fixed incomes often live in older or rental housing that is poorly insulated or has inefficient windows, appliances, etc. Attention to this energy inefficient housing will contribute substantially to reaching our energy and carbon reduction goals.
- The 2% energy excise being proposed is a regressive tax, and fairness dictates that lower-income households receive a greater share of the benefits. It is important to recognize that by participating in available energy sustainability programs, any resident can benefit over time by much more than the 2% energy tax they will pay.

#### Income-based Strategies

- **EnergySmart (ES) and Longs Peak Energy Conservation (LPEC) programs.** In addition to rebate incentives and low-interest financing for credit scores as low as 580 that are available to all Boulder County ES participants, ES [1] and LPEC [2] collaborate on two income-qualified programs. For people with lower credit scores or incomes below 80% BC AMI (Boulder County Area Median Income, for example \$44,750 for a 1-person household or \$63,900 for a 4-person household), ES rebates up to 50% of project costs. About 45% of Lafayette households qualify for this program. LPEC performs free weatherization for people with incomes below 200% of the poverty level (\$23,340 for a 1-person household or \$47,700 for a 4-person household), or who currently receive assistance from certain programs (TANF, AND, OAP, SSI, LEAP). Lafayette should engage in extensive targeted outreach to claim these available resources for our citizens.
- **Enhanced rebates for energy upgrades.** Increasing residential rebates by 50% for the 45% of Lafayette residents with incomes below 80% BC AMI would cost an additional \$57K for total recommended residential rebates of \$300K/year.

#### Other Recommendations

- **Lafayette Rental Ordinance.** Lafayette should consider adopting an ordinance similar to Boulder's SmartRegs, which requires all rental housing to meet basic energy efficiency standards by 2019. This would help address the owner/tenant "split incentive" hurdle, and incentivize energy upgrades in this category of buildings. EnergySmart developed an

innovative strategy that makes it easy and affordable for landlords and property managers to comply.

- **Targeted outreach.** Opportunities such as free LPEC weatherization go unused until people become aware of their existence and benefits through public outreach (see *Appendix D*). Focusing on people with lower or fixed incomes should leverage existing organizations and trusted sources, such as Sister Carmen, the Senior Center, and social groups.
- **Target owner-independent opportunities.** Renters should be incentivized to take advantage of opportunities that don't depend on owner consent, such as LED lighting and certain energy-efficient appliances.
- **DIY Workshops.** Partnering with local businesses (perhaps JAX) or contractors, do-it-yourself workshops facilitated by the city could include such topics as interior window insulation, caulking/weatherstripping, installing solar or wind energy kits, and more, with low-cost materials made available (see *Appendix L*).

[1] <http://www.energysmartyes.com/>

[2] <http://www.bouldercounty.org/family/housing/pages/lpeceatherization.aspx>

## **Appendix J**

### **Business Considerations**

#### **Summary Recommendation**

A variety of Lafayette business persons were interviewed to determine their views and concerns about clean energy in general, and about the Lafayette Clean Energy Stakeholders' approach to elevating its priority in Lafayette in particular. The top three priorities of businesses are cost savings, environmental responsibility, and a "Green" image for their business.

Pleased to be asked for their advice, a number of Lafayette businesses were contacted for their willingness to be Advisors for this report.

Those Advisors are listed in the Acknowledgements section.

Each business owner/manager was interviewed in person and asked 3 basic survey questions with numerous sub set possibilities.

The following questions were asked. What clean energy motivations are you interested in? What measures have you considered? Why did you decide to invest or what stopped you from investing?

Responses included saving money, environmental awareness, difficulty in locating reliable information in one place, don't like paying Xcel more than I have to, tax incentives and rebates, good corporate citizen, employee comfort, and value not clear to name a few.

We will continue surveying additional businesses as time permits.

## Appendix K

### Public Funding Needs

#### Summary Recommendation

Dedicated public funding is needed for: 1) outreach/education, 2) subsidies to incentivize Energy Advising and certain Energy Upgrades (residential and commercial), 3) a professional Energy Expert staff hire, and 4) possible new financing options.

Budget estimates for outreach and for incentives total \$490K/year, approximately equal to the annual revenue from the recommended 2% Energy Excise Tax. New financing options are not being recommended, but hiring an energy professional is likely, which requires either limiting spending on outreach and incentives, or increasing the Energy Excise Tax to 2.5% or 3%.

The recommendation of a 2% Energy Tax is based more on a judgment of how much the voters will bear than on how much could productively be spent on reaching our energy goals. The Lafayette Clean Energy Commission would decide how best to apportion the public funds among the above uses. However, the estimates below could justify up to a 3% Energy Tax if City Council chose to go that route.

#### Outreach / Education

- With the City as a "trusted endorser", we should engage in targeted and sustained public outreach and energy education to promote participation in existing and new energy programs and to raise the level of energy awareness in Lafayette. Funding is needed for occasional city-wide mailings, signs and banners, and other outreach efforts (see *Appendix D*). Budget estimate: **\$40K/year**.

#### Subsidies / Incentives

- **Subsidize Energy Advising** for all Lafayette residents to incentivize taking this first crucial step. A bold but attainable goal would be to offer free energy advising (\$50 fee waived, or \$50 off a full energy audit) to 10% of Lafayette's 9700 households per year. Budget estimate: **\$50K/year**. EnergySmart advising is already free for businesses.
- **Subsidize residential energy upgrades** to incentivize high participation. An estimate based on EnergySmart practices is to rebate 15% of project cost up to \$250 per measure. With the goal of reaching 970 households per year, and assuming the 70% EnergySmart participation rate, 1.5 upgrade measures per participant, and rebates enhanced by 50% for the 45% of Lafayette residents with incomes below 80% BC AMI (see *Appendix I*) leads to a budget estimate of **\$300K/year**.
- **Subsidize commercial energy upgrades**. No EnergySmart commercial rebates are currently offered except in the City of Boulder, where they have a comprehensive list of rebate amounts for HVAC, building envelope, lighting, etc., and an annual pool of money available on a first-come first-served basis. Their rebates, especially on lighting, go very quickly and generate a lot of interest. For estimation purposes we could simply choose a reasonable amount for an annual pool of available rebate funds such as **\$100K/year**.

## **Personnel**

- Most likely a new hire with professional energy expertise will be needed to manage the overall energy sustainability effort in Lafayette. We recommend that this person's salary be paid from the public funds, with benefits and overhead paid from the General Fund (see *Appendix F*). A rough estimate might be in the range **\$60K to \$90K/year**.

## **Financing Options**

- Two new financing possibilities are described in *Appendix G*: a low-interest revolving loan fund with on-water-bill repayment, and a Property-Assessed Clean Energy (PACE) program. Neither program is being recommended at this time, but if implemented each program would require bonding public money in the amount of \$0.5-1M.

## Appendix L

### Policies and Ideas: An Ongoing List

#### **Summary Recommendation**

This list of categorized ideas is intended to suggest specific implementation plans for the Lafayette Clean Energy Commission to consider. It is only intended to be a starting point for an on-going aspirational idea list as input comes in from many sources. A strategic assessment is needed to determine which programs should be pursued and in what order.

#### **Examples of efficient technologies to promote and/or incentivize**

- Energy Star or better appliances (**refrigerators**, front-loading washers, dryers...)
- LED lighting
- Efficient HVAC systems, including evaporative cooling
  - efficient A/C is especially important for peak load shaving
- Solar thermal and geothermal (free fuel)
- Photosensors for exterior lighting (also interior for commercial and municipal sectors)
- Programmable or Smart thermostats (such as Nest)
- Vampire load management (power strips or hard-wired solutions)

#### **Building energy use can be substantially reduced by facilitating such actions as:**

- Sealing and insulation of building envelopes
- Installing "Cool Roofs" ([coolroofs.org](http://coolroofs.org))
- Installing energy-efficient windows and window treatments
- Ground source geothermal heating and cooling
- Solar thermal heating
- Planting strategically placed trees for shading, reduced energy use, increased comfort, and carbon sequestration

#### **Recommended Municipal Actions and Regulations**

- **Additions to 2012 new residential energy efficiency building codes** ("Stretch Codes")
  - "cool roofing" (Energy Star or better; [coolroofs.org](http://coolroofs.org))
  - Appliances (Energy Star or better, [toptenusa.org](http://toptenusa.org), [enervee.com](http://enervee.com))
  - 100% LED lighting
  - Disclose blower door test results to buyers, and consider a higher standard
  - Checklist for builders to sign that the listed regs have been followed
- **Ordinance requiring "life-cycle analysis"** (purchase price + lifetime operating cost)
  - Mainly for larger city purchases (but principle also applies to lighting, appliances, etc.)
  - Specify that non-monetary values may also be considered
- **LED streetlighting.** Continue Administrator's pursuit of a new tariff from Xcel in conjunction with other communities.

- **Encourage solar PV installations.**
  - Streamline solar permitting
  - facilitate bulk neighborhood purchasing
- **Reduce water consumption.**
  - Promote water-efficient landscaping and water-conserving fixtures.
  - Support for conversion to drip irrigation, and publicize city sprinkler tune-up services.
  - Revisit the rate structure.
- **Rental Ordinance.** An ordinance like Boulder's SmartRegs that requires rental housing to meet basic efficiency standards by 2019 would help address the owner/tenant "split incentive" hurdle to implementing energy upgrades. See *Appendix C*.

### **All-encompassing website**

- **Lafayette.** Aim for a comprehensive public-service-oriented website dedicated to all things related to energy sustainability in Lafayette. See example websites below.
- **Garfield Clean Energy Collaborative** (p 134): "One Stop Shop website [garfieldcleanenergy.org](http://garfieldcleanenergy.org) is a directory of resources for taking action. Information on rebates, contractor listings, legislation, events and how-to advice on topics from electric vehicles to heat tape."
- **Midcoast Green Collaborative** website [midcoastgreencollaborative.org](http://midcoastgreencollaborative.org) is similar. They also sponsor DIY workshops.

### **DIY Workshops**

- Model 1: Given by contractors/businesses/enthusiasts, supported by the City (space, maybe materials/instructor subsidies). Low-cost materials made available.
- Model 2: Partner with JAX to do workshops (similar to what Home Depot and Lowes do).
- Example topics: interior window insulation ([midcoastgreencollaborative.org](http://midcoastgreencollaborative.org)); caulking/weatherstrip; wiring T-8 ballasts for LEDs; installing solar or wind energy kits (<http://www.wholesalesolar.com/RV.html>).
- Great for supporting low-income residents and small businesses.



# Case Study: Energy Efficiency Measure – Lighting

## One simple change = net savings of up to \$2000!

### Energy Efficiency Measure (EEM): Replacing (14) T-12 light fixtures with (10) T-8 fixtures

Business: John's All Things Bendable Emporium, located in Boulder, CO  
Hours: Mon-Fri 9am – 9pm, Sat noon – 5pm (65 operating hours/week)

This small business, by replacing old lighting technology can  
**Reduce electricity bills by ~ \$250 annually!**

#### Here's how it works:

In this example, new lighting fixtures cost \$70 each; Xcel Energy offers **rebates of \$25 per fixture**, bringing the cost down to \$45 each. Savings are calculated based upon hours of operation and the lower power consumption. See calculations below.

After a brief 3.6 year payback period, the savings go directly into the business owner's pocket for the life of the lamps, up to an additional 8 years or more<sup>1</sup> – this could mean net savings of over \$2000!

In addition to the financial advantages, this simple retrofit can  
**Reduce CO<sub>2</sub> emissions by 2.2 metric tons per year!**

#### Here's the Breakdown:

##### Costs

|                       |               |
|-----------------------|---------------|
| Material <sup>2</sup> | \$ 450        |
| Labor and disposal    | \$ 450        |
| <b>Total Cost</b>     | <b>\$ 900</b> |

**Average Monthly Energy Cost Savings<sup>3</sup>** **\$ 19.34 /month saved**  
**Average Yearly Energy Cost Savings<sup>4</sup>** **\$ 251.47 /year saved!**

**Excellent Simple Payback Period<sup>5</sup>** **3.6 Years**

**Reduction in CO<sub>2</sub> Emissions<sup>6</sup>:** **2.2 Metric Tons PER YEAR!**

#### Footnotes:

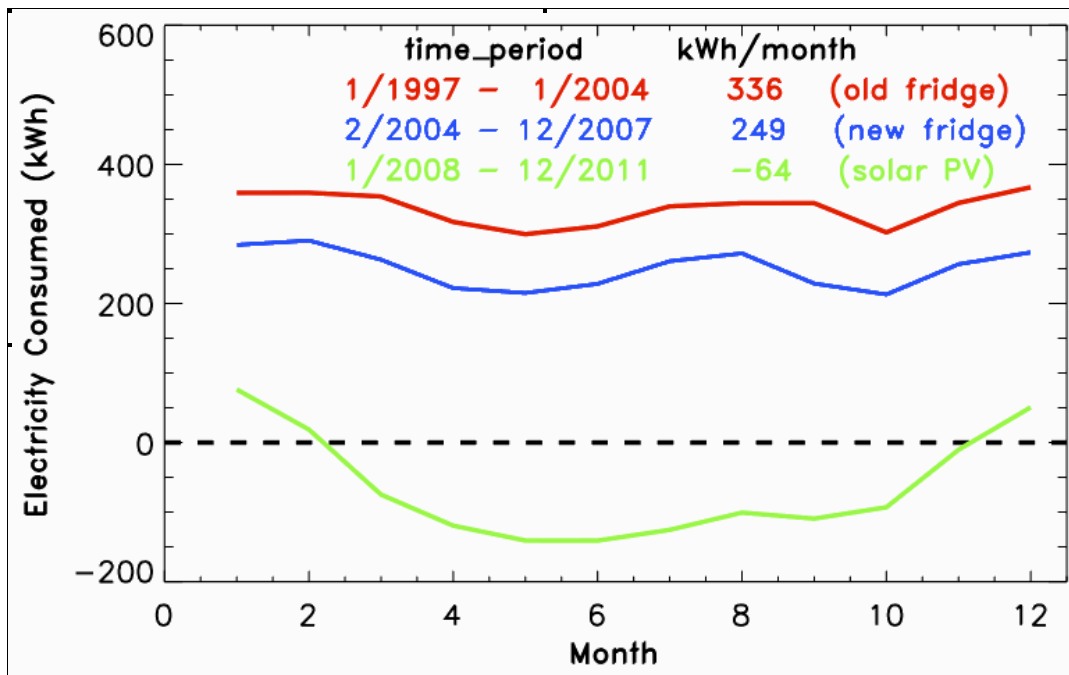
1. Assumptions: Lamp life 40,000 hours, Lights on during all business hours
2. 10 \* (\$70 - \$25 Rebate), sales tax not included
3. [(14 fixtures \* 120 W/fixture) - (10 fixtures \* 75 W/fixture)] \* 1 kW/1000W \* 65 h/wk \* 4 wks/mo \* \$ .08/kW
4. [(14 fixtures \* 120 W/fixture) - (10 fixtures \* 75 W/fixture)] \* 1 kW/1000W \* 65 h/wk \* 52 wks/yr \* \$ .08/kW
5. \$900 initial cost / \$251.47 annual savings
6. 0.00070555 metric tons CO<sub>2</sub> / kWh from <http://www.epa.gov/cleanenergy/energy-resources/refs.html>

# The Refrigerator Story

## An example of why energy efficiency is a great investment

**Key Point:** There are two parts to the total cost of anything that uses energy: the purchase price and the lifetime operating cost. Often the cheapest model to buy costs the most in the long run because it's an energy hog (it's cheap for a reason!).

**Energy Tip:** Before buying any appliance, look for the most energy efficient models by visiting the websites [toptenusa.org](http://toptenusa.org) or [enervue.com](http://enervue.com)



My home's average monthly electricity use (in kWh) for 3 time periods: (red) with an old 1980's "classic gold model" energy-hog refrigerator; (blue) with a new and more efficient refrigerator in 2004; (green) after installing solar panels on my roof in 2008.

### Results of new refrigerator:

- House uses 26% less electricity (forever)
- Saves \$100/year on electricity bill
- Nicer \$600 fridge for FREE in 6 years
- Then pure profit of \$100 saved every year after 2009

### Results of installing solar PV panels:

- Negative electricity use each year (net electricity producer)
- No more electricity bill ever
- Negative carbon footprint for electricity
- Solar panel story is at [LafEnergy.org/ms/PV\\_system/](http://LafEnergy.org/ms/PV_system/)