Messaging for Change:
Tools to Inspire a Beautiful World
PART 2

"What if we don’t change at all ... and something magical just happens?"

Community-Based Social Marketing
Virginia Till – US EPA Region 8
till.virginia@epa.gov

March 10, 2020
$ave Green, Be Green - One Day Workshop for Non-Profits
Denver, CO
Who are you talking to?

• Sustainable Management of Food Lead
• **Your EPA Contact:** Recycling, Composting, Food Waste Reduction, Bridging Urban – Rural Interface, Student of Agriculture, Messaging for Change Training
• Background: Communication, Behavioral Science, Adult Education, Marketing
• @ EPA 9 years
• Local to Colorado
• Amateur Mycologist
EPA Region 8 Protects:
water, land, air, health, YOU!
THE ICEBERG MODEL

EVENTS
What is happening?

Patterns of Behavior
What trends are there over time?

Systems Structure
How are the parts related? What influences the patterns?

Mental Models
What values, assumptions, + beliefs shape the system?

IT'S ALL CONNECTED — SYSTEMS IN ACTION
AGENDA

- Brief Review
- Exercise
- Wrap-Up
CBSM (very)

Brief Overview

“Not bad. They gave us $10.00 a pound for the Tin Man.”
RESOURCES

- cbsm.com
  (free resources: Douglas McKenzie-Mohr)
- socialmarketingservice.com
- other (google search)
What to Call This Approach

- Community-Based Social Marketing
- CBSM
- Messaging for Change
- Tools for Behavior Change
- Other?
5 Steps of C BSM

1) Select Behavior(s) & Specific Audience
2) Identify Barriers & Benefits for behavior(s)
3) Develop Customized Strategies
4) Pilot Messaging & Strategies (VITAL for success) & Evaluate Effectiveness
5) Implement on Wider Scale & Continually Evaluate
Develop Strategies

- Select strategies based on barriers & benefits
- **Strategies**: commitments, social norms, social diffusion, prompts, communication, incentives, convenience
- Pilot test your strategies, ask focus groups
“Traditional” Educational Campaign

Belief: Increase knowledge = behavior change. Information is **ONLY** component.

Community-Based Social Marketing

Belief: Identify audience-specific barriers & address these barriers through benefits/incentives & commitments = behavior change. Information is **ONE** component, but not only component.
Results

Data indicate that pilot implementation could influence a 25% decrease in household food waste.
DURING ACTIVITY: Don’t forget...

**KEEP ASKING YOURSELF**

#1 - Does what I’m doing SUPPORT the end-state behavior I want the community to DO to achieve desired health / environmental / financial outcome?

#2 - Is what I’m doing addressing the particular BARRIERS this community has to DOING the desired end-state behavior?
Discussion

- General Impressions
- “Aha Moments”
- Confusion / Questions
THANK YOU

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DENVER WATER
LEAD REDUCTION PROGRAM

Group name: $ave Green, Be Green
Date: March 10, 2020
Agenda

• Denver Water - overview
• Lead Reduction Program - overview
• You, your neighborhood and what to expect
• Resources
• Q&A
Denver Water Overview

- Founded in 1918.
- Governed by five-person Board of Water Commissioners to provide separation from City of Denver.
- Water supply comes from mountain snowpack.
- Provide potable and recycled water.
- Serve 1.4 million people with only 2% of water used in the state.
- 3,000 miles of pipe.
- 4,000 square miles of watershed land.
How Lead Enters Drinking Water

• There is no lead in water delivered to Denver Water customers

• Lead can get into water as it moves through customers’ lead-containing household plumbing and service lines
A History of Lead in Drinking Water

1918
Denver Water Established

Pre-1951
Lead as Industry Standard
Lead is used to make customer-owned service lines that carry drinking water from main pipelines into homes and businesses.

1951
Denver Water Changes Standards
Denver Water allows use of galvanized steel and copper pipes instead of lead for customer-owned service lines.

1971
Denver Water Bans Use of Lead in Service Lines
Fifteen years before a national ban would be enacted, Denver Water bans use of lead in customer-owned service lines.

1977
Lead Banned from Paint
The Consumer Product Safety Commission bans lead from the consumer paint market, with effect in 1978.

1986
Lead Pipes Banned
Congress approves amendments to the Safe Drinking Water Act, banning lead pipes and plumbing in lead solders.

1991
Lead Removed from Gasoline
Amendments to Clean Air Act require lead be removed from gasoline by 1996.

1991-1992
Leak and Copper Rule Established, Denver Water Enhances Water Quality Testing
EPA's 1991 Lead and Copper Rule establishes water quality testing requirements and action levels for corrosion control. In 1992, Denver Water began testing water from homes with known lead service lines.

1994
Denver Water Identifies pH Adjustments to Reduce Corrosion
Denver Water begins using pH adjustments to reduce likelihood of lead getting into water from customer-owned lead piping.

1994
Reduction of Lead in Drinking Water Act Passes
Congress passes Reduction of Lead in Drinking Water Act, reducing the amount of lead allowed in “lead-free” household fixtures and parts.

2011
Denver Water Launches Lead Reduction Program
Denver Water launches ongoing program to continue education and reduce lead in drinking water, including replacing lead service lines during construction, offering free lead testing, community meetings, school-based outreach, collaboration with community partners and more.

2016
Denver Water Seeks Variance to Orthophosphate Program
Denver Water seeks variance for orthophosphate as well as elements of an alternative solution by requesting a variance that includes an accelerated lead service line replacement program, filter program and decreasing pH for corrosion control, with final proposal due August 2019.

2018-2019
Denver Water Conducts Public Education Campaign and Study
Denver Water launches extensive public education campaign and begins detailed study and analysis of optimal corrosion control methods to enhance protection for customers with lead service lines and plumbing.

2018
CDPHE Designates Orthophosphate
In response to 2012 sampling, CDPHE designates use of additive orthophosphate to reduce risk of lead in drinking water.

2019
EPA Approves Variance
Denver Water will implement Lead Reduction Program beginning in 2020.

2019
Lead and Copper Rule Revisions
EPA publishes draft LCR revisions for review.

Learn More:
303-893-2444
lead@denverwater.org
denverwater.org/Lead
LEAD REDUCTION PROGRAM OVERVIEW
Lead Reduction Program Plan 2020

Corrosion Control Treatment

- Implement pH/Alkalinity adjustment starting March 2020

Lead Service Line Inventory

- Continuous investigation to improve inventory
- Keep an up to date online map publicly available
- Estimated 64,000-84,000 LSLs

Accelerated Lead Service Line Replacement

- Begin construction in March 2020
- Target 4,477 LSL replacements
- Work areas within the City and County of Denver

Filter Program

- Begin initial distribution in March
- Complete distribution by August
- Continue filter replacement distribution until LSLs are replaced

Communications, outreach and education

- Incorporated into every program element
pH – What is it and what’s changing?

• The pH level of drinking water reflects how acidic it is.
• It is measured on a scale of 0 to 14, with 7 considered neutral.
• Raising the pH of tap water reduces corrosivity, reducing the likelihood of lead getting into water as it passes through service lines.
• Changing from 7.8 → 8.8
pH – What is it and what’s changing?

CDPHE officials say there are no health concerns for drinking water with pH levels at 8.8
pH – affect changes in taste/odor?

Raising the pH level of drinking water won’t affect its taste or odor. You may notice that the water feels more “slippery.”
pH - What about plants, trees, fish?

• Plants and trees - Denver Water has been and continues to work with irrigation and landscape experts to provide awareness and to learn more about any potential impacts from the increase. There should not be any major impacts.

• Fish - Different kind of fish prefer different ranges of pH. Consult with your veterinarian or local fish aquarium store for guidance.
Filters – Mailed to your doorstep
Filters – What & When
Filters

When do I need to use the water pitcher filter?

Use it to filter water used for drinking (including making tea and coffee), cooking (particularly when making foods like rice, beans and soup) and preparing infant formula.
ALSLR – What is it and where?

• Denver Water estimates there are 64,000 – 84,000 properties that may have lead service lines.

• It will take 15 years to replace all of them.

• Prioritizing replacement in communities who are most vulnerable and at-risk from lead exposure, underserved communities and planned construction activities.
ALSLR - What to expect during service line replacement

• Information in the mail
• Important – sign the consent form!
• In-home visit for property walk through, review the process and discuss schedule
• Lead service line replaced with copper. Replacement can take 4-8 hours.
• Flush the line in your home (instructions will be provided).
• After replacement, continue using your filter until you complete a final water quality test.
• Restoration is the final step to restore your landscape and paving to prior conditions.
Thank you

- denverwater.org/Lead
- Sign up to get updates
- 303-893-2444
- lead@denverwater.org
Future of Solar for Income Qualified Customers in Colorado
What are the different options customers have?

- Community Solar Garden (1 -4MW)-income qualified residential or commercial accounts were the occupants income does not exceed 185% FPL or the home or building houses income qualified residents, subscriptions can be donated or charged a subscription fees for a locked in discount electric rate
- Roof-Top Residential System - CEO WAP program will complete 250 solar systems on weatherized homes this year (3.5kW)
- Small Site Built Generation(100 -500kW)-new or existing affordable housing developments
- Renewable Connect or Windsource -Premium prices or long term contracts but keep the RECs
COMMUNITY SOLAR BILL CREDITS

Creating long term affordability and clean energy access

- EOC Subscription Statistics
  - 2013-2019: 684 Xcel customers at 185% Federal Poverty Level
- Clean Energy Collective, Community Energy, Clean Focus Renewables, Pivot Energy, Oak Leaf, GRID, AEP, DHA, Offer free subscriptions that cover bill savings of 50 - 100% of usage charge
- Barriers: Language and design of paperwork, Lack of name recognition of developers
- 18 CSGs, 684 households including eight nonprofits, two senior living facilities, and the additional subscribers come from our energy assistance and energy efficiency program
How does EOC manage subscriptions?

**Subscription Terms and Conditions**: All subscribers are at or below 185% FPL, 4 year terms, EOC will verify income on an annual basis, resources needed are several staff members for all customer service inquires, manage tracking portal, income verification, waitlist, and outreach

**Customer Selection**: EOC markets this product to customers in permeant poverty, medical holds, energy efficiency participants, homeless shelters, public and affordable housing

**Subscription Turnover**: EOC ensures the gardens are fully subscribed and will create a waiting list of applicants and organizations from our nonprofit
How do developers and participants feel?

Developers – Residential low income is administratively burdensome and a better market is nonprofits and affordable housing communities that qualify as low income subscribers.

Participants – Paperwork is very complicated and confusing, confusion around program offerings, and what information to provide. In person outreach is most effective and mailers about the program have low return rates. Several participants struggle with understanding why their volumetric charges will be reduced.

Low Income Customer Services – Questions around benefit and why they are receiving this offer, where is the garden located?, frustrated with timeline to sign paperwork and receive no benefit.
LOW INCOME SOLAR ADVOCACY

• EOC has only distributed donated solar capacity
• Goal is to increase access to solar for low-income Coloradans who need it the most
• Utility Owned Low Income CSGs
  – Utility owned will remove minimum credit score, utility bill transparency on credit and charge, no long term commitments, and program adds connection with utilities most vulnerable customers
• Solar Subscription Donation -5% PUC Rule (pre2016) vs. Post-2016
  – Tax deductible donations for solar – rooftop solar on homes, businesses, etc. to be able to be donated for LI subscriber Utility Owned Low Income CSGs
• Streamline process for LICS subscribers
  – Barriers to filling out paperwork and trusting developers
  – Allow EOC to be named on non-disclosure form instead of developer to avoid subscribers filling out same paperwork multiple times
  – Ease the difficulty of working with certain developers – projects changing locations, lack of communication, etc.
PROJECT OVERVIEW

Xcel-Owned CSGs

- **3** Community Solar Gardens with **100%** of the capacity dedicated to low-income residents
  - **2** gardens in Boulder to serve residents of Boulder, Larimer, Weld, Broomfield, Jefferson, Gilpin, Grand Counties
  - **1** garden in Denver to serve residents of Denver, Adams, Arapahoe, Jefferson Counties
- Each garden is **2MW** in size
  - This capacity translates to roughly **400 households** per garden
COMMUNITY SOLAR GARDENS

A more equitable solution

• Most residents are not able to obtain rooftop solar for many reasons:
  • Don’t own their home
  • Poor roof quality
  • Excessive shading from trees, buildings
  • Lack credit-worthiness to finance the equipment

• Community Solar Garden subscriptions offer a solution:
  • No equipment on the home
  • No minimum credit score
  • Long-term electricity price stability
  • Bill credits from Xcel + additional funding contributions

https://www.greensolartechnologies.com/rooftop-solar-power-system-colorado-city-co
http://www.sharedrenewables.org/coop-energy-resources/case-studies/colorado
Current income limit for Community Solar is 185% FPL:
- $23,106 - $83,345 annual income for household size of 1 to 8 persons
- Income limits may be changing to 60% SMI (same as LEAP)
EOC ENERGY ASSISTANCE

Jan – Dec 2019

• EOC partners with numerous Denver agencies to provide energy bill payment assistance
• 2019 YTD has seen nearly 3,000 applicants in Denver county
  • 94% of applicants qualify for Community Solar by being Xcel electric customers at or below 185% FPL
Application

- Database provides access to thousands of LI residents who may qualify for CSGs
- Add utility data consent language to the application to reduce number of forms
- Add check box allowing enrollment in CSG
SUBSCRIBER STRATEGY

Energy Burden

- **Energy Burden**: percent of income spent on home energy costs
- DOE LEAD Tool gives energy burden for CO by census tract
  - Can allow for strategic allocation of CSG subscriptions where the need is the greatest
ENERGY BURDEN

Denver County

• For Denver county residents below 200% FPL, energy burden exceeds 10% in several census tracts
Energy Burden

• Focusing on Denver County residents at 0-100% FPL:
  • Energy burden is as high as 45%
  • Majority of the burden is electricity costs, which can be offset by CSG subscriptions
SUBSCRIBER STRATEGY

LEAP Status Consideration

• Opportunity to serve customers who may not be receiving benefits such as LEAP
  • Only 19% of energy assistance applicants had received LEAP
  • Reasons for denial/ineligibility:
    • Not meeting lawful presence requirement
    • Doesn’t pay for heating costs
    • Failure to provide information
• CSG credits are also on-going, rather than a one-time assistance
CUSTOMER SAVINGS

- Projections from Xcel:
  - $0.02/kWh savings
  - Approx. 19% bill savings for the average customer

- Additional benefit from Denver funding:
  - $100,000 per year would bring the total bill savings up to 50% for the average customer
**EOC’S PROGRAMS**

**Bill Payment Assistance**
- Pay your home energy costs directly to an energy utility.
- Your income must be at or below 160% of Area Median Income for your county.
- Call 911 Energy Help (1.866.462.8165) or find local agency on energyoutreach.org/findagency.

**Low-Income Energy Assistance Program (LEAP)**
- You are a permanent legal resident of the United States or have household members who are U.S. citizens.
- Your income is up to 175% of the federal poverty level.
- Apply online through Colorado Operation LEAP at colorado.gov/leap.
- Call 1.866.862.8165 (1.866.862.8165).

**Critical Intervention Program (CIP)**
- Your primary heating source is not working.
- You qualify and are approved by the Low-Income Energy Assistance Program (LEAP).
- Call 1.866.862.8165 (1.866.862.8165).

**Colorado’s Affordable Residential Energy Program (CARE)**
- You reside in a participating county.
- Your household income is at or below 60% of Area Median Income for your county.
- Call 303.226.5965 or email energoutreach@co.gov for more information.

**Weatherization Assistance Program (WAP)**
- Ten percent of the federal poverty level.
- You automatically qualify if you receive assistance from specific federal programs; contact a weatherization office for the full list.
- Call your local weatherization office at the Colorado Energy Office, colorado.gov/energy/office.

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**ENERGY OUTREACH COLORADO**
ENERGY OUTREACH COLORADO

XCELCSGSUBSCRIBER OUTREACH

3-stage Approach

1) Agencies provide:
   - LEAP Application & EOC Application
   - EOC-developed CSG outreach flyer
     • What is a CSG, how does it work
     • Messaging: ‘you may be subscribed to a CSG, if you qualify

2) EOC letter* once selected for subscription, w/opti on to opt-out

3) EOC letter* once garden is online, explain bill charge/credit again

* Potential to utilize a texting service in addition to/in place of EOC letters
Breaking down a subscription

- Created solar@energyoutreach.org email account
- Needs more quantitative info: bill credits
- FAQs sheet
- English/Spanish versions
CSG REQUIRED PAPERWORK

Streamline onboarding and reduce paperwork barrier

Developer -owned CSGs:
- Low-Income Verification
- Data Consent
- SRC Subscriber Agency Agreement

Xcel-owned CSGs:
- EOC to submit batch LIVs each month*
- Consent to disclose data is already given in LEAP applications; add to EOC application to reduced number of forms & use a checkbox to allow enrollment in CSG*
- Eliminate the SAA*

*pending approval from Xcel
DEVELOPER MARKETING EXAMPLES

Join Community Solar:
Save money and participate in advancing local, clean energy.

Community Energy Solar is providing new opportunities for low-income customers to participate in clean energy. Community Energy’s Community Solar program gives you the opportunity to benefit from local solar with no cost to you and no panels on your property. Joining a Community Solar Garden through Kodl Energy’s SolarRewards Community Program allows you to subscribe to a portion of the solar garden and receive solar net-metering credits for what your share produces. You get paid on your utility bill for the solar energy produced by your Solar Share. It’s that simple! You still buy and use energy from Kodl Energy as you always have, but you’ll receive a payment for your portion of the garden’s solar energy produced as a credit on your bill.

How does Community Solar work?
- We build a solar project in your community.
- You subscribe at no cost to a share of the local solar project.
- You still receive your electric bill as you usually would from Kodl Energy, and now you also get solar credits on your electric bill that save you money.

There are many benefits to joining a Community Solar program:
- No cost to you as a qualifying low income resident
- Save money on your electric bill + no annual renewal process to receive credits
- No equipment or solar panels on your property
- Help to bring new, clean renewable energy to your region

Community Energy’s Community Solar Projects:
- Over 11 community solar projects totaling 23 MW (DC)
- Community Energy is providing for a certain number of low-income customers to subscribe to a solar share and receive credits at no cost
DEV E L O P E R / E O C OUTREACH EXAMPLES

June 7, 2018

Dear [CARE participant],

Previously, the Energy Resource Center authorized your home to help lower your energy bill and improve your comfort and safety. This was provided to you for FREE through the Colorado Affordable Residential Energy (CARE) program. We are sending you this letter to tell you about another opportunity that can help you save additional money on your energy bill.

Our partner Community Energy is developing several solar gardens in the San Luis Valley. A solar garden is a large collection of solar panels at one location that are connected to generate electricity for Xcel Energy. Because of your past participation with the CARE program, you pre-qualify for FREE electricity from these solar gardens.

Sign up TODAY by filling out the enclosed application and returning it via mail no later than May 1, 2018 to qualify to receive a FREE monthly credit on your Xcel Energy bill starting in February 2019 for up to 20 years. The credit amount will be determined by your home energy usage – it could be as much as your entire bill.

Energy Outreach Colorado is a nonprofit organization that supports the CARE program and is helping enroll limited-income households into this project. If you have questions about the information provided here, please contact me at harmon@energyoutreach.org or call 303-226-7064.

Sincerely,

Jenna Harmon
Utility Programs Assistant
Energy Outreach Colorado
harmon@energyoutreach.org
303-226-7064
Eco-friendly Waste Disposal for Facilities

Recycling turns things into other things. Which is like MAGIC.

Suzanne Satter and Alejandro Dopico – March 10, 2020
$ave Green, Be Green
Who are you talking to?

• Recycling Specialist
• **Your EPA Contact for:** Recycling, Nonprofit and Faith-Based Organizations
• **Background:** Chemistry, Environmental Engineering, Environmental Remediation
• **Years at EPA:** Four
• **Knitter/Crocheter, Fiber Dyer and Spinner**
Who are you talking to?

• Director of Operations @ PCs for People
• Originally from Spain
• @ PCs for People 4 years
• Actual Mission: To close the digital divide by getting PCs and internet in every house that can’t afford it.
• World Traveler with his super dog, Nasa
Today’s Topics

• Reduce. Reuse, Recycle Intro
• Electronic Recycling
• Where is our “Trash” Going
• Eco-Friendly Solutions
• Q&A
EPA Approach

The Waste Management Hierarchy

1. **REDUCE**
   - Minimize the amount of waste produced
2. **REUSE**
   - Use materials more than once
3. **RECYCLE/COMPOST**
   - Use materials to make new products
   - Recover energy and metals from waste
4. **RECOVER**
   - Safe disposal of waste to landfill

Most Desirable Option

Least Desirable Option
Sustainable Materials Management (SMM)

Circular vs Linear Economy

CC 3.0 Catherine Weetman 2016
The Impacts of E-Waste

- Only 12.5% recycled
- Can contain hazards (lead & mercury)
- Can hurt environment / health
The Basel Convention

• Multilateral agreement signed by 172 countries
• Prevents transfer of hazardous waste from developed to less developed countries.
• Only 1 developed country didn’t sign

Electronics Landfill, Ghana
R2 Certification

• **R2 is Leading Certification**
  – Strict protocols for sustainable handling
  – Focus: data protection & safety
  – *Challenge:* $$$ to maintain; Traditional recyclers charge high fees.

• **PCs for People R2 certified recycler.**
PCs for People Highlights

- 501C3 non profit
- Founded 10 years ago in MN
- Expanded to CO in 2015.
- Opened in OH in 2018.
- Mission:
  1. Put computers and internet in every home that cannot afford it.
  2. Reduce the amount of electronic waste in the landfill.
- Impact: 80,000+ computers have been repurposed for families & students.
Options for Non Profits

• Up-Cycle Program for Non Profits
  – Recycle your e-waste for free!
  – Free pick-up of more than 15 usable computers.
  – Free drop-off of electronics.
  – Discounts to Upgrade equipment:
    - 22” Screens: $25
    - Microsoft Office: $10
    - High-performance computers: $150
MSW Generation in 2017
267.8 Million Tons

- Paper and Paperboard: 25.0%
- Food: 15.2%
- Plastics: 13.2%
- Yard Trimmings: 13.1%
- Metals: 9.4%
- Glass: 4.2%
- Wood: 6.7%
- Textiles: 6.3%
- Rubber and Leather: 3.4%
- Other: 1.9%
- Misc. Inorganic Wastes: 1.5%
MSW Recycling in 2017
67.2 million tons

- Paper and paperboard: 65.7%
- Metals: 12.4%
- Glass: 4.5%
- Plastics: 4.4%
- Wood: 4.5%
- Rubber, leather, and textiles: 6.3%
- Other: 2.2%
Where is our “Trash” Going

- Landfilling: 52.5%
- Recycling: 25.8%
- Composting: 8.9%
- Combustion with Energy Recovery: 12.8%
Total MSW Landfill by Material, 2017

139.6 million tons

- Paper and Paperboard: 13.1%
- Plastics: 19.2%
- Food: 21.9%
- Metals: 9.9%
- Glass: 4.9%
- Glass, Wood: 8.7%
- Textiles: 8.0%
- Rubber and Leather: 3.5%
- Misc. Inorganic Wastes: 2.3%
- Other: 2.1%
- Yard Trimings: 6.2%
Let’s Talk About Plastics and Food

• Plastics and Food Waste make up 40% of materials in landfills.
Food Waste

• In the **US**, **food waste** is estimated at between 30-40 percent of the **food** supply. Approximately 133 billion pounds.
WHY DOES EPA CARE ABOUT WASTED FOOD?

Methane Gas Emissions

$160 billion annually

Wasted Food = Largest Percentage in Landfills
Customizable Options

Food Recovery Hierarchy

- Source Reduction
- Feed Hungry People
- Feed Animals
- Industrial Uses
- Composting
- Incineration or Landfill

- Prep / Storage / Purchasing Adjustments
- Donation to Community / Share Table
- Prep Scraps to Chickens
- Used Cooking Oil for Fuel
- Plate Waste from Lunchroom
Plastic Waste

U.S. scrap plastic exports to all countries, 2015-2019

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<th>Year</th>
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<td>2018</td>
<td>2 billion</td>
</tr>
<tr>
<td>2019</td>
<td>1 billion</td>
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</table>
What happened to all that plastic?

• It’s estimated that 6.3 billion metric tons of plastic have been used and discarded as waste.

• Only about nine percent of plastic produced is recycled on average globally.
What Changed

• China’s economic growth and standard of living have skyrocketed

• The government now sees the waste-recycling industry as a low-profit and low-value enterprise.
Solutions

• **REFUSE** single-use plastic items that you can do without

• **ASK** for reusable cutlery and pass on plastic straws in restaurants

• **REPLACE** single-use items with reusable items

• **GIVE UP** non-recyclable, plastic, disposable items

• **PROMOTE** the choice of single-use items made of eco-responsible materials
From waste to Schools: Computer Distributions
Electronic Success

Waste that Teaches
Electronic Success

Individuals acquiring computers from the store
Why Become Eco-Friendly?

• **Serves your mission**

You’re already doing what you can to help others – make saving the planet part of your organizations’ mission as well
How to Become Eco-Friendly?

• Buy Recycled Products
• Reduce paper use
• Print in draft mode on both sides
• Ditch the paper cups, plates and disposable utensils
How to Become Eco-Friendly?

• Compost if you have the option
• Buy compostable products
• Reduce energy consumption
  – Switch to LEDs
  – Turn off lights & equipment
How to Become Eco-Friendly?

• Start/energize recycling program
  – Find a “champion”
  – Conduct a waste audit
  – Find out what is recyclable
  – Set up well-labeled waste bins

https://earth911.com/
How to Become Eco-Friendly?

• Start/energize recycling program
  – Educate, educate, educate
  – Monitor the recycling
  – Inform maintenance staff
  – Share the results!
Resources

- EPA Sustainable Materials Management: https://www.epa.gov/smm
- Food recovery: https://www.wedontwaste.org/mission/
- EPA WasteWise Program: https://www.epa.gov/smm/wastewise
- Excess Food Opportunities Map: https://geopub.epa.gov/ExcessFoodMap/
THANK YOU!!!

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Alejandro Dopico
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720.278.7725
Prioritizing Energy Efficiency Upgrades
Low/No-Cost Improvements

Christie-Anne Edie
High-Performance Operations Specialist
GSA Region 8
Topics

- Understanding your Energy Bill
- Simple Payback & Life Cycle Cost Analysis
- Thermal Comfort
- 5 Key Low/No-Cost Strategies
Understanding your Energy Bill

- **Rate Structure**
  - **Commercial** = Usage (kWh) + Peak Demand (kW)
  - **Residential** = Usage (peak built-in)

- Reduction strategy depends on rate
## Electric Residential

### Natural Gas Bill looks very similar

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<th>METER READING INFORMATION</th>
<th>Read Dates: 08/07/18 - 09/05/18 (29 Days)</th>
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<tbody>
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<td>CURRENT READING</td>
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<tr>
<td>Total Energy</td>
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### ELECTRICITY CHARGES

**Rate changes Seasonally:** Summer & Winter

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<th>USAGE UNITS</th>
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<td>Service &amp; Facility</td>
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<td>$5.41</td>
<td></td>
</tr>
<tr>
<td>Summer Tier 1*</td>
<td>311 kWh</td>
<td>$0.054610</td>
<td>$16.98</td>
</tr>
<tr>
<td>Trans Cost Adj</td>
<td>311 kWh</td>
<td>$0.001520</td>
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<tr>
<td>Elec Commodity Adj</td>
<td>311 kWh</td>
<td>$0.026430</td>
<td>$8.22</td>
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<td>Demand Side Mgmt Cost</td>
<td>311 kWh</td>
<td>$0.001980</td>
<td>$0.62</td>
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<tr>
<td>Purch Cap Cost Adj</td>
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<td>CACJA</td>
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<td>$0.002870</td>
<td>$0.89</td>
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<tr>
<td>Renew. Energy Std Adj</td>
<td></td>
<td>$0.67</td>
<td></td>
</tr>
<tr>
<td>GRSA</td>
<td></td>
<td>- $0.95 CR</td>
<td></td>
</tr>
</tbody>
</table>

**Subtotal** $33.66

- **Franchise Fee** 3.00% $1.01
- **Sales Tax** $1.27

**Total** $35.94

---

**Tier 2 starts @500 kWh**

Rate almost doubles
### Electric Commercial

#### Meter Reading Information

<table>
<thead>
<tr>
<th>Description</th>
<th>Current Reading</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Contributing Energy</td>
<td>139132 Actual</td>
<td>139132 kWh</td>
</tr>
<tr>
<td>Contributing Demand</td>
<td>Actual</td>
<td>328 kW</td>
</tr>
<tr>
<td>Total Energy</td>
<td>592197 Actual</td>
<td>592197 kWh</td>
</tr>
<tr>
<td>Demand</td>
<td>Actual</td>
<td>1314 kW</td>
</tr>
<tr>
<td>Billable Demand</td>
<td></td>
<td>1314 kW</td>
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</table>

#### Electricity Charges

<table>
<thead>
<tr>
<th>Description</th>
<th>Usage Units</th>
<th>Rate</th>
<th>Charge</th>
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<tbody>
<tr>
<td>Service &amp; Facility</td>
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<td>$34.40</td>
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<td>Secondary General</td>
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<td>$0.004610</td>
<td>$2,730.03</td>
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<td>Elec Commodity Adj</td>
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<td>$0.026430</td>
<td>$15,651.77</td>
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<td>Distribution Demand</td>
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<td>$5.630000</td>
<td>$7,397.82</td>
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<td>Gen &amp; Transm Demand</td>
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<td>$14.020000</td>
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<td>Trans Cost Adj</td>
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<td>$630.72</td>
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<td>Demand Side Mgmt Cost</td>
<td>1314 kW</td>
<td>$0.620000</td>
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<td>Purch Cap Cost Adj</td>
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<td>CACJA</td>
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<td>Renew. Energy Std Adj</td>
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<td>GRSA</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td><strong>$48,396.97</strong></td>
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<tr>
<td>Franchise Fee</td>
<td></td>
<td>3.00%</td>
<td>$1,451.91</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$49,848.88</strong></td>
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</tr>
</tbody>
</table>

**Promises Total:** $49,848.88
Peak Demand (kW)

- ~2pm peak (esp. during cooling season)
- Load shifting (alternative pricing options)
Simple Payback & Life Cycle Cost Analysis

<table>
<thead>
<tr>
<th>Furnace</th>
<th>Current</th>
<th>New #1</th>
<th>New #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency</td>
<td>60%</td>
<td>96%</td>
<td>88%</td>
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<tr>
<td>Install Cost</td>
<td>$0</td>
<td>$2,500</td>
<td>$2,000</td>
</tr>
<tr>
<td>Annual NG Cost</td>
<td>$750</td>
<td>$350</td>
<td>$450</td>
</tr>
<tr>
<td>Annual Savings</td>
<td>$0</td>
<td>$400</td>
<td>$300</td>
</tr>
<tr>
<td>Payback</td>
<td>N/A</td>
<td>6.25 yrs</td>
<td>6.67 yrs</td>
</tr>
</tbody>
</table>

- Cheapest option now isn’t always cheapest long-run
- Savings continue past payback
- LCCA adds Maintenance costs
Electricity usually more $$$ than NG

Projects targeting electricity typically save more $$$
Rebates “Incentives”

- Check local (Xcel) utility provider
- Check State/National programs
HVAC = Biggest Energy User (Cooling + Heating)

- **Thermal Comfort (4 Factors)**
  - Temperature
  - Humidity
  - Air Flow
  - Radiation (Solar)

- Heat rises
5 Key Low/No-cost Strategies
Things you can do in the next year
1. Programmable Thermostats

- **Occupancy Schedules**
  - 7-day, 5-2 & “Smart”
  - Occupied vs. Unoccupied
  - Early Mon (start)/Fri (shutdown)
  - Holidays
  - Overrides

- **Setpoints**
  - Heating = 70
  - Cooling = 74
  - During unocc: Night/Wknd Setback 55/90
  - Location of Thermostat
1. Programmable Thermostats

- **Zones**
  - Target certain spaces & exclude others
  - Occ vs. unocc

- **Load (Need)**
  - Where are the people?
  - How many?
  - For how long?
HVAC Alternatives

- Ceiling Fans
- Evaporative Cooling
  - Good for our dry climate
- Passive Strategies
  - Trees (shade)
  - Blinds
  - Awnings/Overhangs
  - Open windows
    (free cooling)
2. (Stop) Air Infiltration

Building Envelope (Thermal Barrier)
Stopping Air Infiltration

Methods
- Weather-stripping & doors sweeps
- Seal Intrusions
- Vestibule/Mud Room – Transition
- Windows don’t pay back

Tip: Plan contractors for opposite season

Testing
- Thermal Imaging Camera
- Use candle to check drafts
3. Preventative Maintenance

“A Stitch in Time”

- HVAC Filters
- Reliability-Centered Maintenance
  - “Fix-on-fail”
  - Criticality or Consequence of failure?
- Roof
  - White shingles = same price
4. Energy Monitoring

- **ES Benchmarking**
  - Performance over time
  - And against neighbors
  - Free!
  - Required by Energize Denver >25,000 SF

- **Energy Audit**
  - Optimize Operations
  - Learn Strengths/Weaknesses
NG Summer ‘Baseload’
Hot Water Heater
5. Lighting Upgrades

- **LED**
  - Same lumens from way less wattage (60W = 9W)
  - ~3-5 yr payback
- **Spot vs. Complete re-lamping**
- **Improved lighting quality**
  - Color Temperature – Warm vs. Daylight
  - Incandescent (emits heat) = more cooling load
  - Fluorescent ‘hum’
- **Occupancy Sensors**
  - Strategic placement – bathrooms, nothing blocking, etc.
  - Not in unsafe environments
  - Outside timers
    - X # minutes or dusk-to-dawn
Key Takeaways

**Payback**
- Cheapest now vs. cheapest long-run
- Electricity is more expensive than NG
  - Saving electricity usually saves more money
- Check for rebates

**Thermal Comfort Factors:**
- Temperature
- Humidity
- Air Flow
- Radiation
5 Key Low/No-cost Strategies

1. **Programmable Thermostats** - optimize heating/cooling setpoints & schedules

2. **Air Leaks** - seal to control

3. **Preventative Maintenance** - “a stitch in time” - maintaining equipment saves money later

4. **Energy Monitoring**
   - Benchmark in Energy Star
   - Get an Energy Audit

5. **Lighting** - LED & Occupancy Sensors pay for themselves in no time
Prioritizing Building Upgrades and How to Pay for Them

Peter Rusin - Faith Energy Management

Advance Lighting Design

Solar Power Options

Boiler replacement and modern controls addition
Three Take Aways

1) How to utilize energy spend as an asset

2) The basics of Colorado PACE and how to get started / more info

3) Xcel Energy Business Financing Program (includes non-profits)
Who is Faith Energy Investors?

- A Colorado business dedicated to helping faith based organizations view their energy spend as an asset and not a mandatory budget line item
- Financial problem solvers assisting parishes and faith based schools and affordable housing to get the most benefit out of projects
- A partner, who’s goal is a long term relationship and the implementation of projects that reduce operating costs
Why Faith Energy Exists

- Many Churches and schools have a backlog of capital expenditures or would like to improve their building’s efficiency but do not have a technical roadmap.

- Funding energy efficiency measures requires capital that must compete with other budgetary priorities or organizational needs.

- Typical energy efficiency financing benefits are often not available to faith based buildings.

- Faith Energy seeks to address these issues leading to real dollar savings to 250 fund ministry jobs by 2023.
Energy Outreach Colorado Programs

Affordable Housing Rebate Program (AHRP)
- Provides above market rate rebates to low-income property owners.
- Rebates cover substantially more of the project cost than standard rebates, helping cash-strapped owners to complete retrofits.
- Michael Harris, Residential Program Manager, at 303-226-7061 or at mharris@energyoutreach.org

Non-Profit Energy Efficiency Program (NEEP)
- Energy efficiency grant program for 501c3 organizations that serve low income community members.
- Common measures: HVAC, weather-stripping, programmable thermostats, aerators, pipe insulation, hot water heater.
- Program aims to pay up to 100% of costs = high likelihood of bidded work reaching completion.
- Brooke Pike, NEEP Program Manager, at 303-226-5060 or at bpike@energyoutreach.org
Utility Spend as an Asset

<table>
<thead>
<tr>
<th></th>
<th>Approved (Jan-Dec) Annual Budget</th>
<th>Current Month (March) Actual</th>
<th>YTD (Jan-Mar) Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fees</td>
<td>$5,500.00</td>
<td>$375.00</td>
<td>$4,405.00</td>
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<tr>
<td>Grants</td>
<td>450,000.00</td>
<td>150,000.00</td>
<td>225,000.00</td>
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<tr>
<td>Other revenue</td>
<td>8,000.00</td>
<td>998.45</td>
<td>2,296.54</td>
</tr>
<tr>
<td>Total revenue</td>
<td>$463,500.00</td>
<td>$151,373.45</td>
<td>$231,701.54</td>
</tr>
</tbody>
</table>

| **Expenses:**        |                                 |                            |                      |
| Salaries and wages   | 426,000.00                      | 35,229.11                  | 105,222.13           |
| Membership dues      | 3,500.00                        | 225.00                     | 985.00               |
| Board/committees     | 6,500.00                        | 626.13                     | 1,256.24             |
| Rent                 | 13,200.00                       | 1,100.00                   | 3,300.00             |
| Utilities            | 6,000.00                        | 489.12                     | 1,589.24             |
| Miscellaneous        | 4,800.00                        | 195.45                     | 4,212.85             |
| Volunteers           | 3,500.00                        | 233.26                     | 795.25               |
| Total expenses       | $463,500.00                     | $38,098.07                 | $117,360.71          |

| **Surplus/Deficit**  | $                             | $113,275.38                | $114,340.83          |
Utility Spend as an Asset

Energy improvements: Lighting

Total amount of Project: $12,400 (after utility rebates)

Annual Energy Costs: $6,000

Annual Reserve or Loan Payment: $2,522 (6 years at 6%)

Annual energy cost savings: $2,840

Average annual cash flow: $318 (Net)
Utility Spend as an Asset – Example 2

Energy improvements: Boiler and Thermostat Replacement

Total amount of Project: $45,000

<table>
<thead>
<tr>
<th></th>
<th>Pre Replacement</th>
<th>Post Replacement</th>
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</thead>
<tbody>
<tr>
<td>Natural Gas Cost</td>
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<td>$9,000</td>
</tr>
<tr>
<td>Maintenance Cost</td>
<td>$14,000</td>
<td>$3,000</td>
</tr>
<tr>
<td>Total Annual Cost</td>
<td>$26,000</td>
<td>$12,000</td>
</tr>
</tbody>
</table>

Energy Only Payback: 15 years ($45,000 / $3,000)

Real Payback: 3.2 years ($45,000 / $14,000)
Standard for Success

• In Colorado non-profit building potential savings based on energy use (gas and electric) per square foot (sq ft)
  • Under $1 / sq ft = 5-10% savings available
  • $1- $2 / sq ft = 10-20% savings available
  • More than $2 / sq ft = 20% or more savings available

• How to calculate
  • Annual Utility Spend is $6,000
  • Square footage of Building is 4,000 square feet

  • $6000 / 4000 sq ft = $1.50 utility dollars per square foot

• Don’t Forget About Maintenance Cost!
What is Colorado PACE (C-PACE)?

C-PACE is a voluntary tax assessment-based, private financing program

- Commercial sector, including office, agricultural, multifamily, etc.
- Supports energy and water improvements that lead to utility cost savings
- Private lenders such as banks make loans which are repaid through the county assessor system
- Nonprofits can participate in program due to parcel id

New Energy Jobs Act in 2015 enabled the creation of C-PACE

- Established the New Energy Improvement District (NEID) – Statewide District
- Each Colorado has to join the district separately
- Program Administrator must review every project
Value Proposition of PACE

Financing Benefit

• Finance 100% of project costs
• Longer duration financing = cash flow positive projects that increase Net-Operating Income
• Reduces project cost of capital by utilizing county tax system and first lien status (lenders view the loan more secure than a mortgage)

Building Benefit

• Avoid unplanned capital investments
• Addresses “split incentive” under some scenarios
• Assessment/lien transfers with the property
• Reduce operating cost through savings on utilities and maintenance
How Colorado PACE works?

County Assessor’s Office

payment via assessment through existing tax system

County Remits Payment to Lender

Nonprofit

Contractor installs equipment

Lender

Lender pays contractor based on work milestones and nonprofit approval

Lighting, HVAC Contractor, etc.
Where is PACE Available?
Get More Information on C-PACE

Main Website:

www.copace.com

C-PACE Team Contact:

- Tracy Phillips
  Director, C-PACE Program
  Email: TPhillips@copace.com

Phone: (720) 933-8143
Xcel Energy has partnered with the National Energy Improvement Fund (NEIF) to provide access to capital

- Commercial, non-profit, and municipal sector, including office, agricultural, multifamily
- Supports energy improvements that lead to utility cost savings
- NEIF uses an online portal to link non-profits to private lenders
- NEIF has a national footprint and non-profits outside of Xcel service area can participate
Value Proposition of Xcel Financing

Financing Benefit
- Finance 100% of project costs
- Smaller project size can be financed - $3,000 minimum
- Online Portal can provide estimated cash flows
- Financing approvals are subject to credit review
- Easy 1-2 page financing application and approvals in 24-48 hours
- 2-7 year terms (up to 12 years in some circumstances)

Building Benefit
- Avoid unplanned capital investments
- Equipment, not building secures the loan
- Reduce operating cost through savings on utilities and maintenance

- Note NEIF can also provide PACE funding
More Information on Xcel Program

Main Website:

https://www.neifund.org/financing-businesses

Team Contact:

- Heather Braithwaite
  Vice President, Commercial Lending
  Email: hbraithwaite@neifund.org

  Phone: (303)-704-5057
Three Take Aways

1) How to utilize energy spend as an asset

2) The basics of Colorado PACE and how to get started / more info

3) Xcel Energy Business Financing Program (includes non-profits)
Thank you for being interested in reducing your energy costs and carbon footprint!

Peter Rusin
Faith Energy Investors

Email: peter@faithenergy.net

Phone: (970) 445-0138