



# Boulder's Energy Transition

City Council Study Session  
May 10, 2016



# Agenda

Part 1: The Future of Electric Utilities

Part 2: Update on Municipalization

Part 3: Transitioning Boulder to a Carbon-free  
Future & Proposed Targets

## YOAB Video

<https://vimeo.com/164121193>



# Part 1: The Future of Electric Utilities

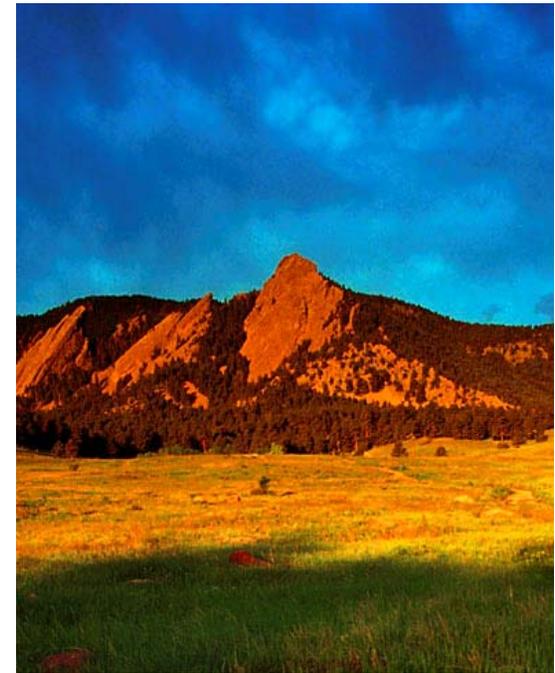
Ron Lehr, Energy consultant and former Colorado PUC Chair

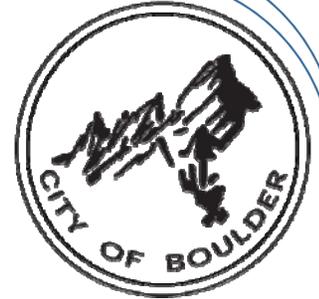




# Part 2: Update on Municipalization

Tom Carr, Boulder City Attorney

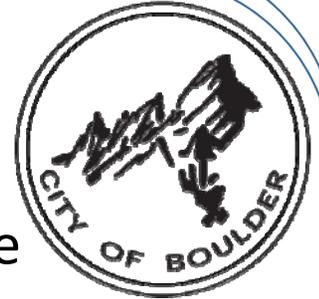




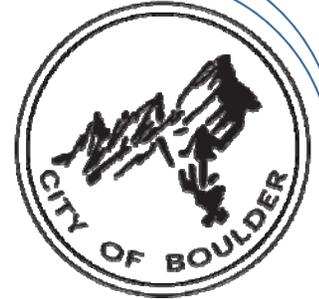
## PUC Proceedings

- City filed a petition for transfer of assets – July 7, 2015
- Xcel moved to dismiss for failure to comply with the PUC's orders – August 5, 2015
- City moved to supplement – September 23, 2015
- PUC Decision – Dismissing part of the Application and granting motion to supplement and for a limited discovery period – December 30, 2015
- PUC Decision – Granting Unopposed Motion for Discovery Plan - April 19, 2016
- Xcel data to the city – May 19, 2016
- City supplemental application – Summer 2016

# Criteria for supplemental application

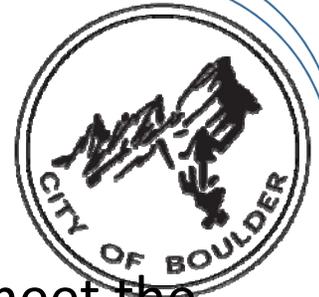


- Maintain or improve the safety, reliability and operation of the systems
- To the extent possible, serve all customers within the current city boundary
- No additional poles, when possible
- Undergrounding of new facilities when possible
- Any facility crossing open space will be underground – no new poles on open space
- Not require Xcel to use any city facility to serve a remaining Xcel Customer



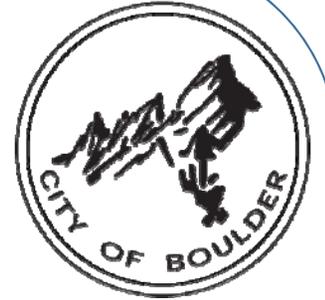
# Transition Plan

- Plan will depend on the reconfigured system
- Intent is to file the plan after the approval of transfer of assets
- Transition costs will be financed and included in the rates
- Funding plan will depend on separation plan



## Off-ramps

- Council has asked staff to advise if the project can no longer meet the Charter requirements:
  - Charge rates that do not exceed those rates charged by Xcel Energy
  - With revenues sufficient to pay for operating expenses and debt payments, plus an amount equal to twenty-five percent (25%) of the debt payments,
  - Reliability comparable to Xcel Energy
  - A plan for reduced greenhouse gas emissions and other pollutants
  - Increased renewable energy
- Staff will review the revised plan based on the data to be provided by Xcel and report to council in late June or mid-July

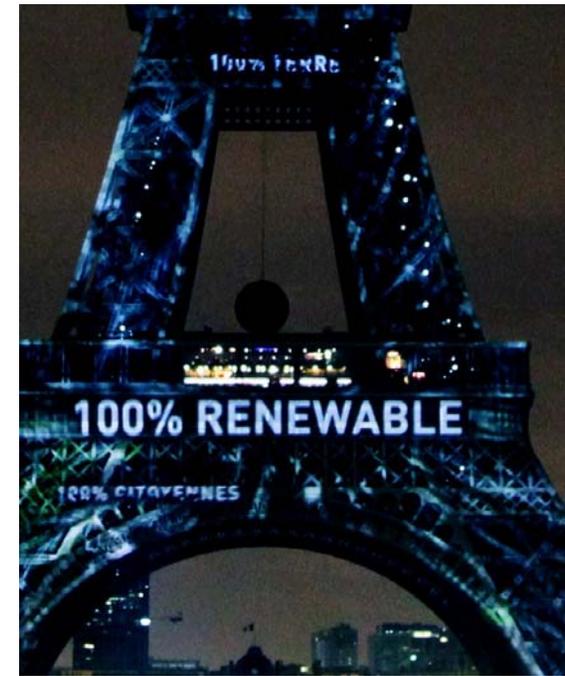


# Goals



# Part 3: Transitioning to a Carbon-free future

Jonathan Koehn, Regional Sustainability Coordinator  
Brett KenCairn, Senior Environmental Planner



# A History of Commitment



<b>GOAL AREA: Greenhouse Gas Emissions</b>		<b>Milestones</b>		
		<b>2020</b>	<b>2030</b>	<b>2050</b>
<b>TARGET 1: Emissions reductions</b>	Reduce greenhouse gas emissions by at least 80% below 2009 levels before 2050	40%	60%	80%
<b>GOAL AREA : Energy Supply</b>		<b>Milestones</b>		
		<b>2020</b>	<b>2030</b>	<b>2050</b>
<b>TARGET 2: Renewable Electricity</b>	Derive 100% of electricity from renewable sources based on total community consumption	50%	100%	100%
<b>TARGET 3: Local Electricity Generation</b>	Total installed capacity of clean electricity from local sources	50 MW	100 MW	175 MW
<b>TARGET 4: Natural Gas Replacement</b>	Percentage reduction in community natural gas consumption	15%	40%	80%
<b>TARGET 5: Petroleum Replacement</b>	Percentage reduction in community petroleum consumption	5%	25%	80%

## Targets in Detail

Overall Emissions	Reductions from 2009
2020	<del>40%</del> 25%
2030	60%
2050	80%

## Targets in Detail

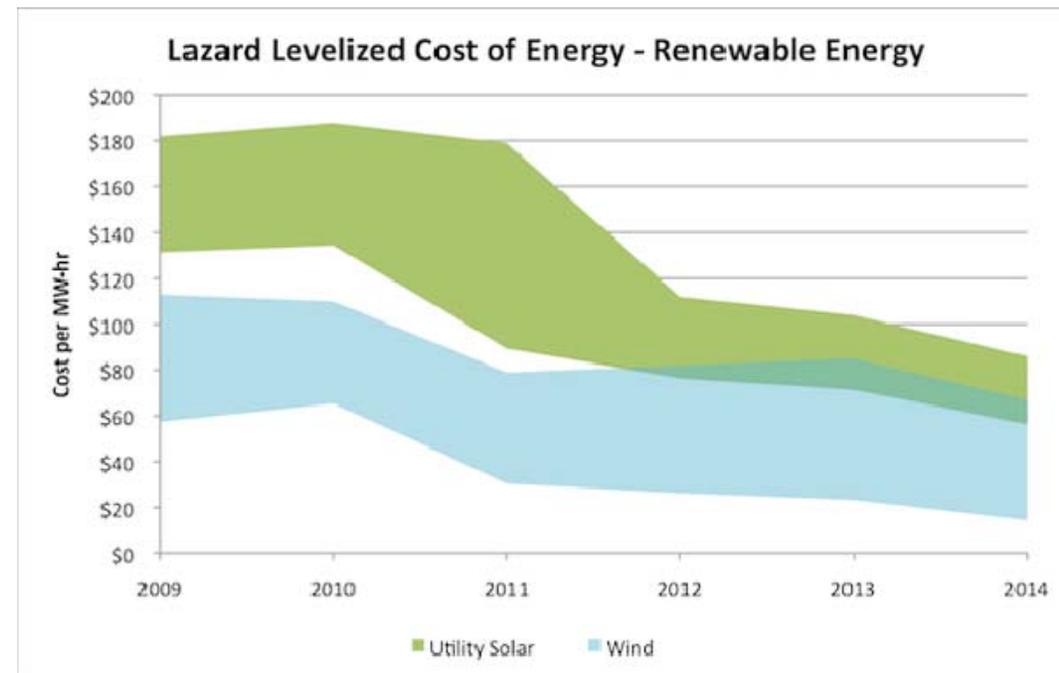
Renewable Electricity	Percentage of Consumption
2020	<del>50%</del> 35%
2030	100%
2050	100%

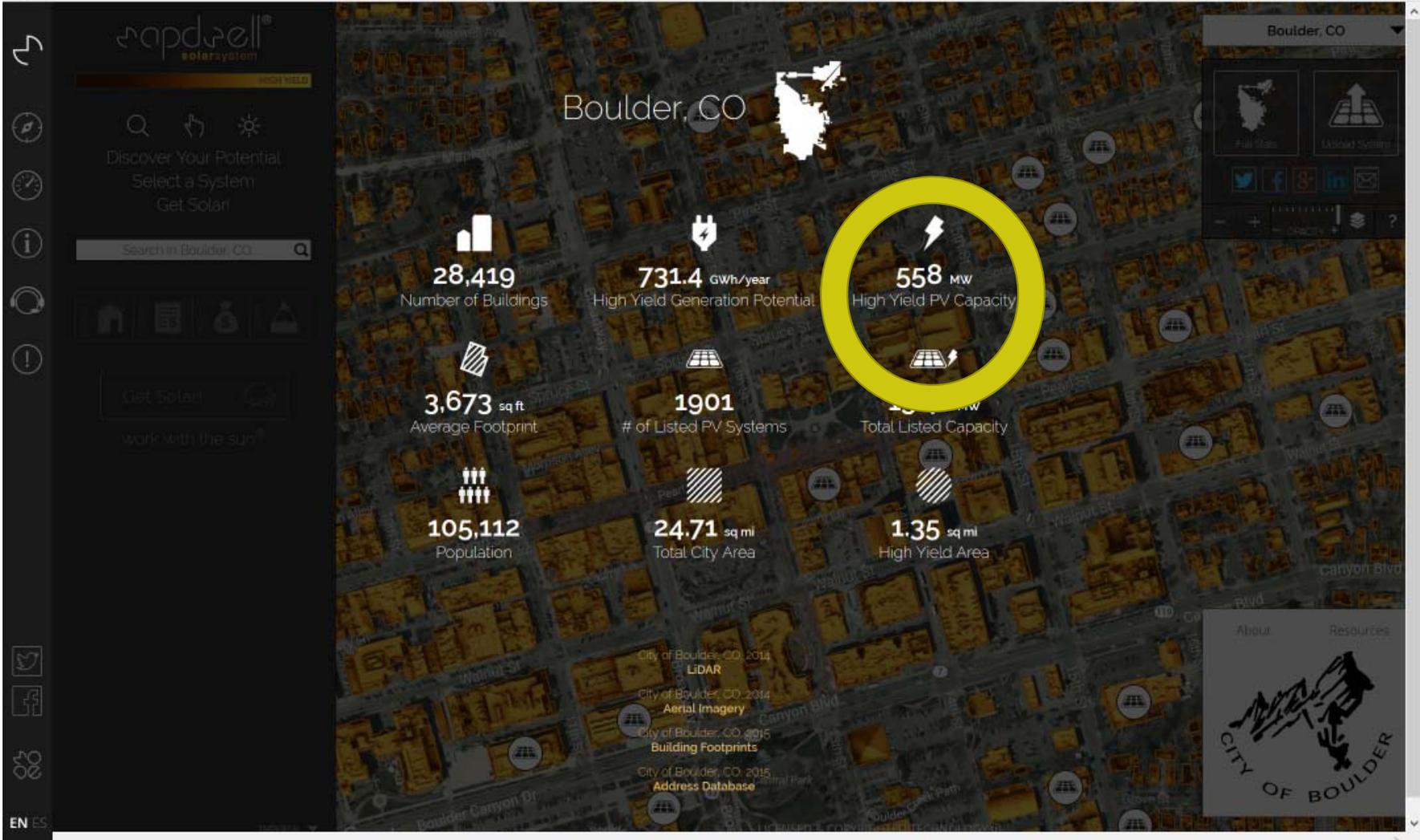
## Targets in Detail

Local Generation	Installed MW
2020	50 MW
2030	100 MW
2050	175 MW

## Why Do We Think We Can Achieve The Targets?

- Cost of Renewables
- Energy policy
- Global Climate Commitments
- Local Capacity

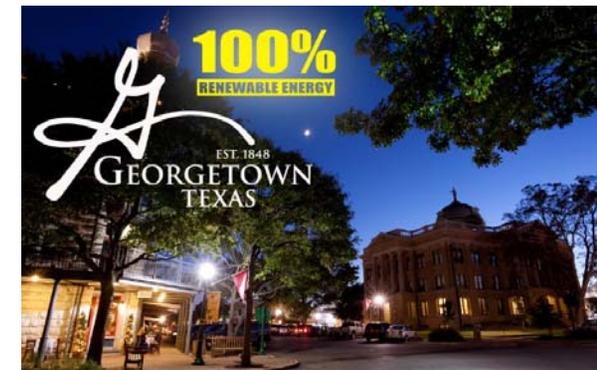
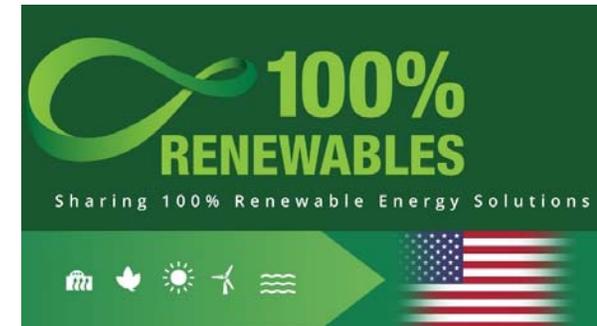




# Communities

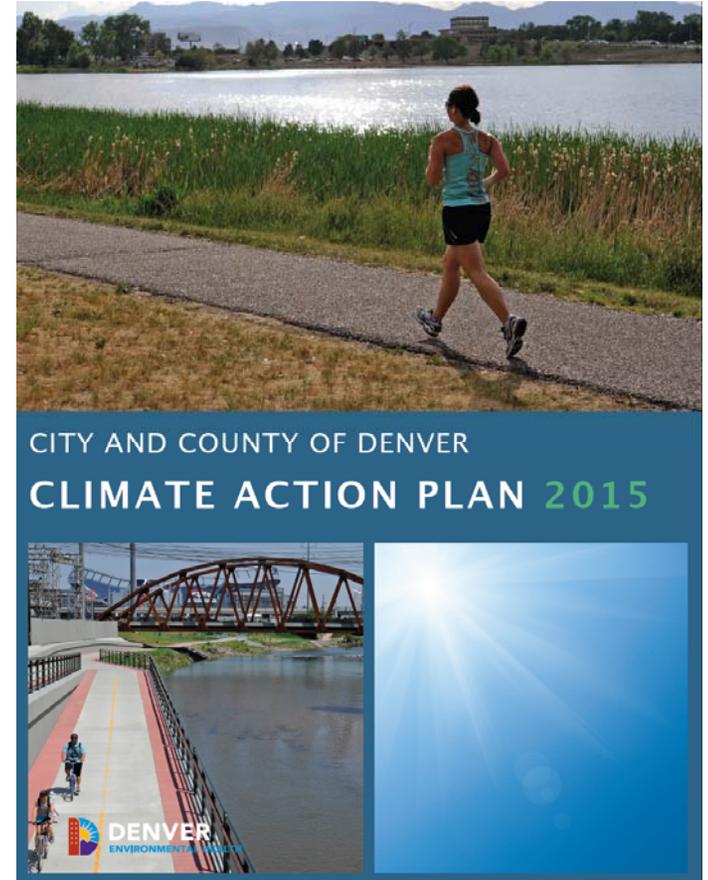
## 100% renewable targets

- Georgetown, Texas
- Vancouver, BC
- San Diego
- Burlington, Vermont
- Greensburg, Kansas
- San Francisco
- San Jose
- Palo Alto
- Aspen
- La Paz, Mexico
- Marin County
- East Hampton, NY

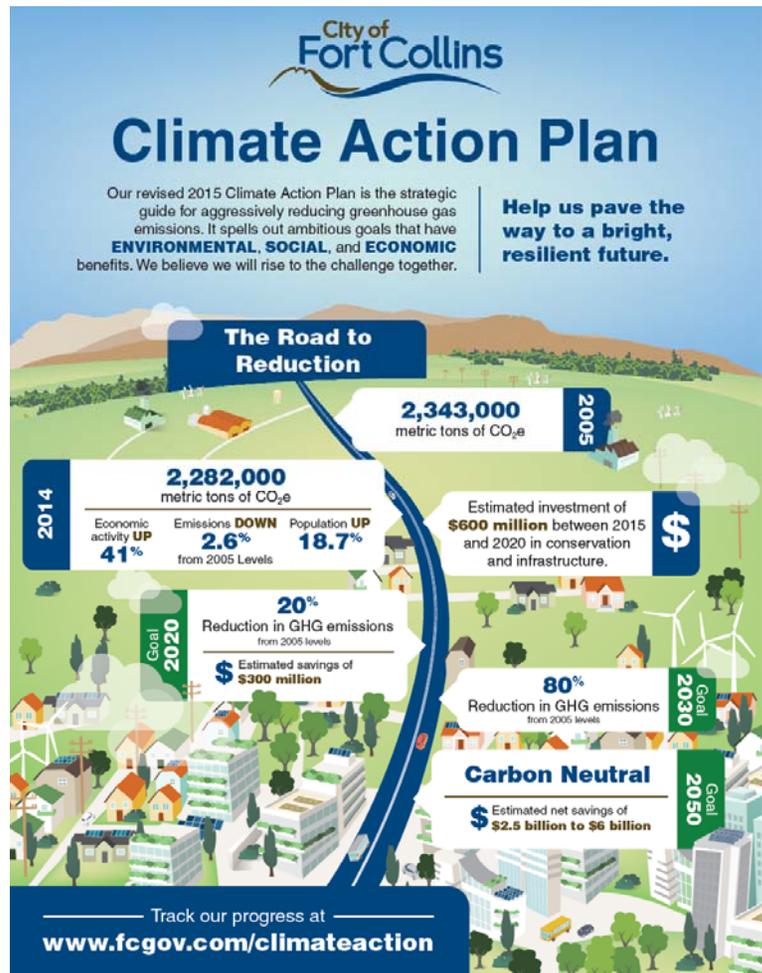


## Case Studies: Denver

Denver has adopted a goal of reducing emissions 80% by 2050, and has a goal to **decrease fossil fuel consumption by at least half of the total consumed for by 2020.**



# Case Studies: Fort Collins



Fort Collins aims to reduce its total emissions 20 percent by 2020 and 80 percent by 2030 across all sectors.

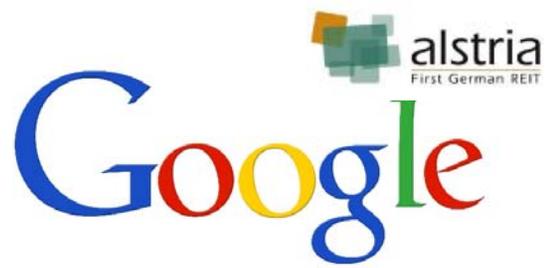
Fort Collins also aspires to reach carbon neutrality by 2050.

# Companies Seeking 100% Renewable Electricity

Bloomberg



*Coca-Cola Enterprises*



Adobe

facebook



Level(3)  
COMMUNICATIONS

Johnson & Johnson  
FAMILY OF COMPANIES

Swiss Re

Biogen



Walmart

Goldman Sachs

ING



# 100% Renewable Electricity- How will we get there?

- Changes to our portfolio
- Increased efficiency
- On-site, Local Generation & Technology Advancement
- Accelerated Community Participation



# Whole Energy Systems Transition

# Stabilizing Climate – The Three Key Focus Areas

## *Energy*

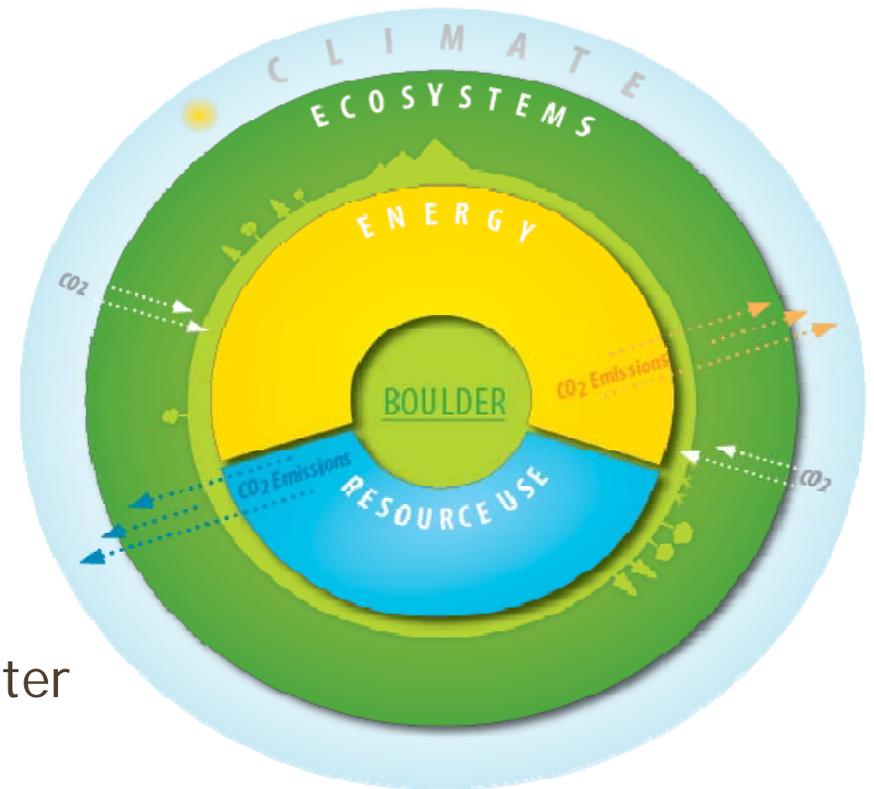
Rapid replacement of fossil fuels with renewable energy

## *Resources*

Reduce waste and the carbon intensity of materials/resources used

## *Ecosystems*

Restore and enhance ecosystems and sequester carbon



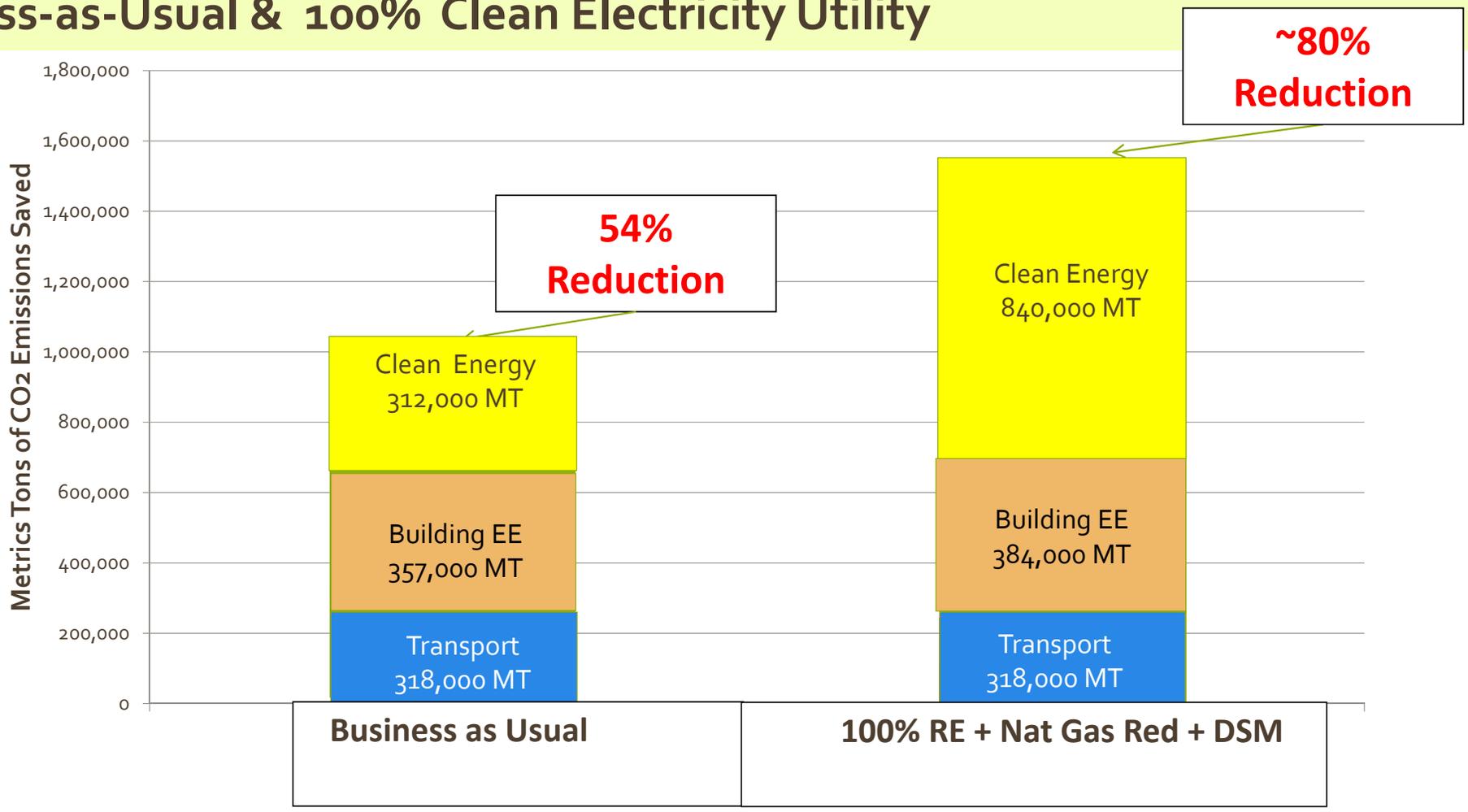
## IT'S ABOUT ENERGY!



"The answer to climate change is not a mystery. It's not some pie-in-the-sky policy that we haven't discovered yet. It is staring us in the face, folks. **It's called clean energy.** It is that simple. And we're simply not going to get where we need to be unless we move rapidly towards a global, low-carbon, clean energy economy."

**John Kerry**, US Secretary of State, October 8<sup>th</sup>, 2015

# Two Potential Pathways to 80% Emissions Reduction by 2050: Business-as-Usual & 100% Clean Electricity Utility



**To reduce emissions 80%...**



**We need an 80% or more clean energy system**

# Three Core Elements of Energy Systems Transition

1. Reducing demand

2. Decarbonizes Supply

- 100% Clean Electricity Source
- 80% or greater retirement & conversion of-NG
- 80% or greater retirement/conversion-petro

3. Build energy resilience/security



# Six City Convening on Energy System Transformation

**Boston  
Minneapolis  
Seattle  
Portland  
San Francisco  
Boulder**

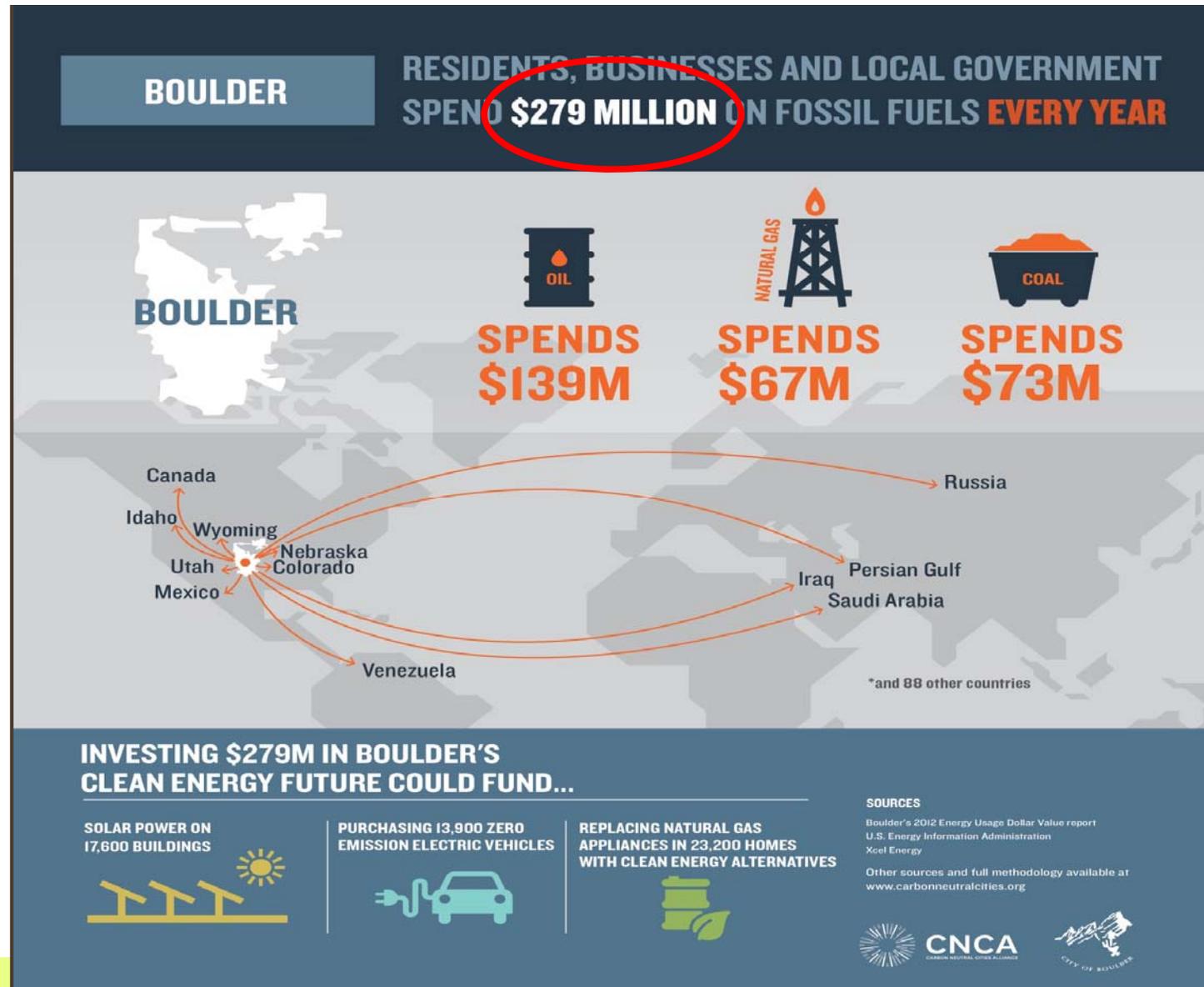


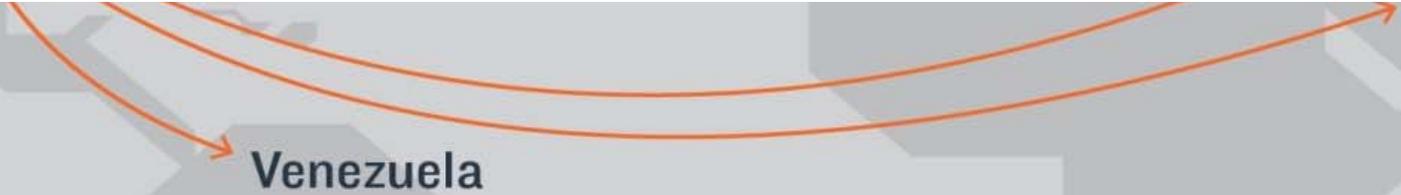


# Cities, Climate Change & Energy: *The Big Realization*

**There's more at stake than emissions  
reduction**

# ECONOMIC VITALITY: Where do our energy dollars go?





## INVESTING \$279M IN BOULDER'S CLEAN ENERGY FUTURE COULD FUND...

**SOLAR POWER ON  
17,600 BUILDINGS**



**PURCHASING 13,900 ZERO  
EMISSION ELECTRIC VEHICLES**



**REPLACING NATURAL GAS  
APPLIANCES IN 23,200 HOMES  
WITH CLEAN ENERGY ALTERNATIVES**



\*an

SOU

Boul  
U.S.  
Xcel

Oth  
www



# MINNEAPOLIS

RESIDENTS, BUSINESSES AND LOCAL GOVERNMENT SPEND **\$1.1 BILLION** ON FOSSIL FUELS EVERY YEAR



SPENDS \$626M



SPENDS \$302M



SPENDS \$134M

- Canada
- Montana
- North Dakota
- South Dakota
- Wyoming
- Colorado
- Mexico
- Iowa
- Kentucky

Venezuela

Persian Gulf  
Saudi Arabia

\*and 65 other countries

INVESTING \$1.1B IN MINNEAPOLIS'

SOURCES

### 2016 Solar Home Panels

Locked-In Electricity for 20+ Years Big Tax Break, No Upfront Money



## Front Range flunks on air-quality group's ozone report card

By: DAN ELLIOTT, Associated Press · April 20, 2016 · Updated: April 20, 2016 at 5:51 pm



Caption +

DENVER — The Colorado Front Range got failing grades on ozone pollution, and Western Slope counties didn't do much better, an annual report card on air quality said Wednesday.

The Front Range got all Fs from Colorado Springs through Greeley and Fort Collins, the American Lung Association's State of the Air 2016 report said.



AMERICAN LUNG ASSOCIATION.

1-800-LUNGUSA

Submit a Question | Live Chat

How can we help you?

Advertisement for 2016 Solar Panels, featuring the headline '2016 Solar Panels' and subtext 'Locked-In Electricity for 20+ Years Big Tax Break, No Upfront Money'.



www.lung.org > Our Initiatives

### Related:

US Sen. John McCain probes into mine spill

Pros help Sierra create outdoor class project

### State of the Air

- Key Findings
- City Rankings
  - Cleanest Cities
  - Most Polluted Cities
- Compare Your Air
- State List
- Health Risks
- For the Media
- Share Your Story
- About

### Colorado: Boulder

Boulder County

Denver-Aurora, CO

If you live in Boulder County, the air you breathe is...

Ozone



Particle Pollution



# EQUITY & ENVIRONMENTAL JUSTICE:

Who benefits & who bears the Impacts of our fossil fuel use?



## Following High Court Ruling, What Happens To Oil & Gas Moratoriums In Boulder, Broomfield?

By DAN BOYCE & INSIDE ENERGY • 9 HOURS AGO

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A workover rig operating at a well site near Erie, Colo.

DAN BOYCE / INSIDE ENERGY

# ENERGY FREEDOM & ENERGY RESILIENCE:

## Who controls our ability to produce value and manage risks?

### Your Configuration

91kW

2.92 k Trees Planted   125 T Carbon Offset   15 Homes Powered

**\$134k** Cost   **\$22.8k** Revenue

6 - year payback

198 Goldenrod Dr  
Boulder, CO 80302

DEFAULT SAVE INVEST DRAW

**Get Solar!**

work with the sun®

### Financials

Building Type: Commercial  
PV System Ownership: Customer

System Size	Cost per Watt	Total Cost
91.18kW	\$ 2.80	= \$ 255,296

- Federal Tax Credit: \$ (76,589)
- Solar Rebate: \$ (1,478)
- Federal MACRS: \$ (37,956)
- Other Deductions: \$ 0

**Cost to Owner: \$ 133,831**

- Net Metering: \$ 1,360
- Xcel Energy Solar\*Rewards: \$ 538

Average Monthly Revenue: \$ 1,898  
Average Yearly Revenue: \$ 22,777

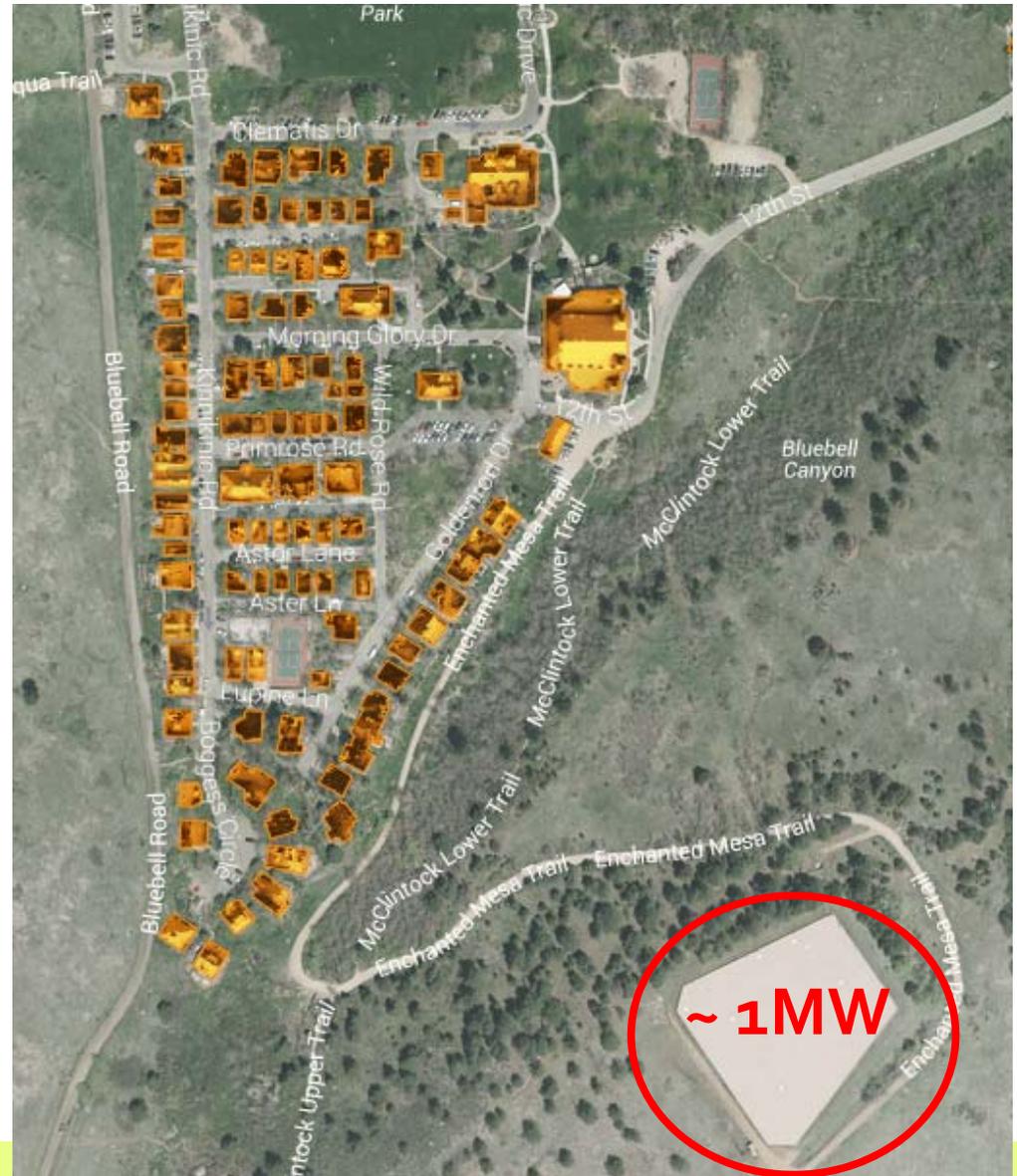
Payback Period: 5 years, 11 months  
Net Present Value (20y / 5%): \$ 153,014  
Return (IRR / 20y): 18.0%

Comparative Investments: DOW -2.23% - GOLD -10%

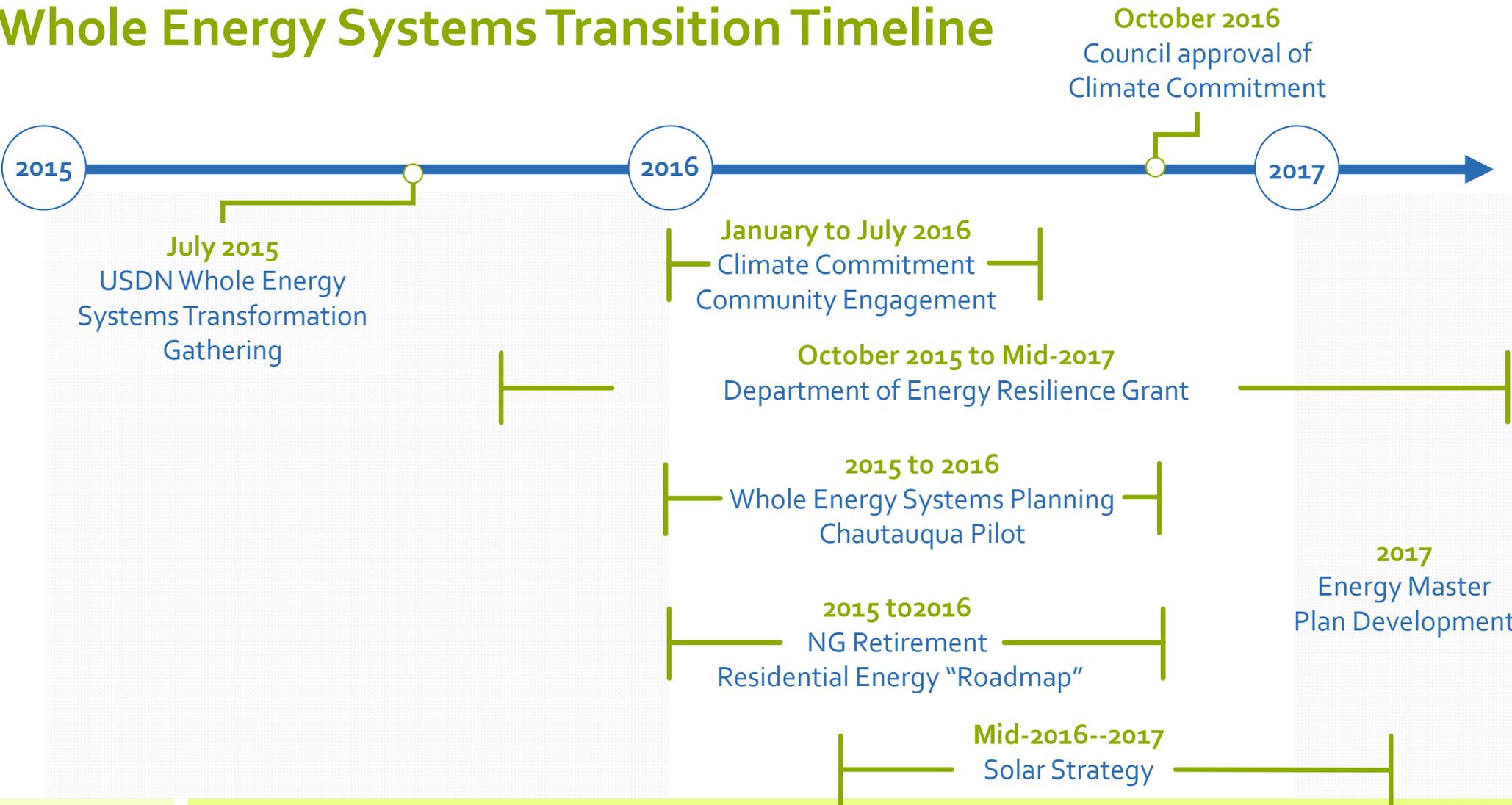
Show Payment Calculator



# ENERGY FREEDOM & ENERGY RESILIENCE: Who controls our ability to produce value and manage risks?



# Whole Energy Systems Transition Timeline



# The Energy Future We Dare to Imagine



# Questions for Council

1. Questions related to the concept of a whole energy system transition?
2. Does Council have feedback on the draft clean energy target of 100% by 2030? Should staff consider an alternative?
3. Feedback on including additional criteria in evaluating transition pathways?
4. Questions about stakeholder engagement?