City of Roeland Park Climate Action Plan

Feb 17, 2020 Sunny Sanwar, Ph.D.





Climate change mitigation is complex

Transportation

- Traffic intensity and activity
- Fuel economy
- Alternative fuel infrastructure / EVs
- Biking and walking

Gals, therms, gge, VMT Regional planning org.

Buildings

- Building types & codes
- Envelope design
- Occupancy levels
- End-use system & equipment, time-of-use
- On-site fuel, solar

kBTU/sq. ft. Cities and counties

Power and utility

- Fuel mixes (purchased RE/integration)
- Capacity, Demand flexibility
- Boiler efficiencies, T&D losses

mm BTU, MW, MWh States

Environmental scientist(s)

- Emissions factors, GWP
- Multi-GHG assessment of emissions (CH₄, N₂O, CO₂ CF₄ SF₆)
- Community resilience

MT CO₂e (Scope 1, 2 and 3) Technical consultants

Financial analyses

- Cost-benefit analysis
- Monetary savings
- Economic damages
- Job creation
- Scenario planning

Investments, savings (\$, y, r%) Municipal advisors + vendors

Engagement & implementation

- Stakeholders involvement + targeted outreach
- Hierarchical impact assessment
- By blocks, zip-code + parcel/tax-lot
- GIS and data-specialists

Assets, entities, individuals Community groups + data scientists

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		City c	of Roeland Park, KS		EB 🖾 🗐 🗐 á
m From Trom Table/ Recent Existing Refresh Prope		5.0			What-If Forecast Group Ungroup Sub
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Get & Transform Data Queries & C			, 217	-	Forecast Outs
* × × & 38.6461258294268	Commorpial buildings		2019		
	Commercial buildings				
	Petroleum (fuel oil)	US gal	1,232	0.50/	V W X Y
05 Missouri 38.68737 38.58248 -90.5724 -90.7693 3 10 Missouri 38.46455 38.39067 -90.3456 -90.4657 38.4	Natural gas	MMCF	32,451	25%	1726795 4.33E+07 2.19E+07 2.66E+07 .62E+07 6.35E+07 3.90E+07 4.72E+07
11 Missouri 38.62676 38.58123 -90.478 -90.6408 38.6	Electricity	MVVh	18,934		325+07 9.235+07 6.025+07 6.705+07
17 Missouri 38.72653 38.60833 -90.4833 -90.5852 38.	-				72E+07 1.17E+08 6.90E+07 8.08E+07
21 Missouri 38.59647 38.53654 -90.4615 -90.6051 38.5					.57E+07 1.22E+08 7.70E+07 8.50E+07
26 Missouri 38.55659 38.44099 -90.4195 -90.5124 38.5	Industrial facilities		2019		.26E+07 9.49E+07 5.89E+07 6.48E+07
31 Missouri 38.84862 38.7671 -90.3056 -90.3874 38.8	Petroleum (fuel oil)	US gal	2,308		25E+07 9.49E+07 6.71E+07 5.84E+07
33 Missouri 38.82114 38.77164 -90.2261 -90.3203 38.7	Natural gas	MMCF	15,182	3%	.296+07 6.246+07 3.976+07 4.646+07
34 Missouri 38.86847 38.80921 -90.225 -90.3397 38.8 38 Missouri 38.63204 38.54246 -90.5984 -90.7319 38.5			· · · · · · · · · · · · · · · · · · ·	570	4773645 4.25E+07 3.24E+07 2.93E+07 42160.9 7889460 4817440 5849181
40 Missouri 38.58732 38.56355 -90.6004 -90.6601 38.5	Electricity	MVVh	1,260		34939.2 1.645+07 1.035+07 1.215+07
42 Missouri 38.82474 38.75905 -90.3245 -90.4499 38.					52E+07 4.17E+07 2.69E+07 2.40E+07
43 Missouri 38.75762 38.69818 -90.4079 -90.4998 38.7	Residential buildings		2019		.695+07 4.485+07 3.435+07 3.825+07
44 Missouri 38.79906 38.72259 -90.3701 -90.4736 38.7					.07E+07 2.74E+07 2.15E+07 2.46E+07
45 Missouri 38.77694 38.75792 -90.4559 -90.4766 38.	Petroleum (fuel oil)	US gal	1,712	E 404	5140.32 91975.04 33241.66 16373.34
49 Missouri 38.53859 38.42295 -90.4783 -90.586 34-4	Natural gas	MMCF	198,342	54%	1590515 1.63E+07 1.25E+07 1.28E+07
52 Missouri 38.45404 38.32574 -90.3597 -90.5207 38. 34 Missouri 38.74262 38.71069 -90.3698 -90.451 387	Electricity	MVVh	30,559		1490228 7619500 4091467 4360091 1244500 2.15E+07 1.74E+07 1.66E+07
58 Missouri 38.56883 38.53038 -90.4645 -90.5438 38.5					1215390 1.68E+07 1.08E+07 1.10E+07
99 Missouri 38.54165 38.54165 -90.4781 -90.4781 38.5					526.263 2082.136 3239.974 0
01 Missouri 38.63707 38.62583 -90.1869 -90.1982 38.6	Transportation		2019		68113.7 1645497 1517778 468969.2
02 Missouri 38.65913 38.60622 -90.1808 -90.2013 38.6	Aviation	US gal (jet fuel, aviation gas	soline) 442,133		915794 2363835 1570302 1353839
03 Missouri 38.64053 38.61666 -90.1966 -90.2363 38.6	Railway	US gal (diesel fuel and elec	· · · · · · · · · · · · · · · · · · ·		79142.4 4825459 3464130 2379664
04 Missouri 38.6253 38.59429 -90.1886 -90.2428 38.6	-	<u> </u>		19%	1843352 1.150+07 8381366 5151613
05 Missouri 38.65775 38.63371 -90.3017 -90.3531 38.6 06 Missouri 38.65515 38.63432 -90.1872 -90.2293 38.6	Waterborne	US gal (motor gasoline and			1076924 1.67E+07 8431128 8509979 1062175 1.04E+07 7107617 6116111
07 Missouri 38.6825 38.65088 -90.1954 -90.2313 38.6	On-road	US gal (motor gasoline and	d diesel) 992800		20564.1 4774144 3794471 3413408
08 Missouri 38.65673 38.63364 -90.2292 -90.2766 38.6					1011358 1.018+07 7242925 3922572
09 Missouri 38.59865 38.56466 -90.2713 -90.3184 38.5	Prelimenary data based on Dy	namhex proprietary model on city-wide gree	enhouse gas emissions (as of 11/20	18). For	1127279 1.985+07 3.515+07 2.715+07
10 Missouri 38.64586 38.60611 -90.2352 -90.3002 38.6	methodology, see				1232101 1.50E+07 1.11E+07 9412049
11 Missouri 38.58077 38.52848 -90.2249 -90.2705 38.5	Renewable sources of energy,	3610717 1.41E+07 8705115 4538614			
12 Missouri 38.67941 38.63924 -90.2628 -90.3031 38.6	factors.				1040201 1.09€+07 8024976 4865716
13 Missouri 38.67229 38.64354 -90.2232 -90.2723 38.6 54 Missouri 38.72476 38.6778 -90.3255 -90.4085 38.7	SPNO (SPP North) aggregates	used for regional power and heat footprinti	ing		80739.9 5232131 8241930 2601729 .24E+07 6.03E+07 4.10E+07 4.18E+07
15 Missouri 38.69439 38.65861 -90.2192 -90.2643 38.4	Transportation intensity is sho	2113893 1.34E+07 1.65E+07 1.14E+07			
16 Missouri 38.60589 38.55382 -90.2426 -90.305 38.5		(steam, waste, etc.) not shown			1202228 3.27E+07 3.82E+07 2.29E+07
17 Missouri 38.64043 38.61886 -90.3034 -90.3619 38.6.	Non-energy based emissions	(oreani, waste, etc.) not snown			65271.7 1.195+07 7300108 6953205

S.S7E+07 17141.9

8.98E+07 18647.4 6.90E+07 19333.6 4.88E+07 16613. 1.81E+08 16930.8

9.07E+07 14037.2

5586224 13945.

1.668+08 17575.5 2.32E+08 21390.4 1.11E+08 452468.

2.21E+07 34709.7

9.166+07 7328.08 4.22E+07 10630.9 5.43E+07 14383.4 3.41E+07 6192.19 6.71E+07 8883.39 2.59E+07 8792.98

6.64E+07 6861.72 4.66E+07 6961.16

6.468+07 7434.43

Simplify sustainability

Visualize complex emission sources

- Boils down RP footprint into a single visual:
 - Fossil fuels use mitigation opportunity
 - Improve efficiencies in energy delivery

Evaluate low-carbon solutions

- Switch from fossil-fuels and electrify
- Adopt more renewables at grid and on-site

What does clean RP mean? Colored city visual



Engage sustainably

City and her stakeholders collaborate

- Help communities mitigate climate change
 - From individual citizens to organizations
 - Work with utilities tangibly

• Show and measure impacts for each action or strategy





* Visual representation for example purposes only

Meet targets

Plan actions

Personalized decarbonization strategies

- Set and meet city and community targets
- Plan infrastructure projects and policies

Plan city-targets better and quicker

- Maintain projects visual KPIs like costs and impact
- Engage stakeholders and be on target



Engagement

Households

City goals

- How to decarbonize residential buildings sector?
- *How much* emissions to be reduced, *where* and *when*?

Residential buildings (54%)

- Distribution of fuel-based vs. electric heating
- Target energy efficiency retrofits and savings

Community impact and engagement

- Climate risks in underserved communities
- Housing stock by block, on-site DER potential

54% of city's footprint



Engagement

Local businesses

City goals

- How to decarbonize commercial/industrial stock?
- *How much* emissions to be reduced, *where* and *when*?

Commercial buildings (25.31%)

- Building types University, vs. retail, vs. offices
- Industrial processes + systems (3.19%)

• Engagement

- Corporate emissions targets and sustainability
- Each business can help reach climate goals

82% of city's footprint



Engagement



City goals

- How to decarbonize transportation?
- *How much* emissions to be reduced, *where* and *when*?

Transportation (17.69%)

- Gasoline and diesel vehicles, vs. electric
- Passenger vehicles and trucks, vs. fleet

• Engagement

- Vehicles owned by citizens and local businesses
 - Commuters, bicyclists, pubic-transit riders
- Corporate fleets and new mobility models

98% of city's footprint



How does it work?

Roeland Park meets Paris Climate Targets



Start now

Claim City of Roeland Park today

