AGENDA
Sustainability Advisory Board Meeting
Wednesday, November 13, 2019 @ 5:30 PM
Parks & Recreation Administration Building, 1141
Massachusetts Street

The purpose of the Sustainability Advisory Board is to advise the Governing Body of the City of Lawrence, Kansas, regarding issues affecting sustainability, environmental protection, waste reduction, recycling, energy conservation, and natural resource conservation environmental protection.

A. CALL TO ORDER:

B. APPROVE MINUTES:

1. Approve October 2019 minutes. 3 - 5
   SAB minutes10.09.19 draft

C. AGENDA ITEMS:

C.1 SAB ADMINISTRATION:

C.2 PRESENTATION:
   a) Municipal Services & Operations Department: Introduce new staff, reorganization, relevant operations

C.3 SUBCOMMITTEE REPORT:
   a) Renewable Energy Subcommittee 6 - 38
      Lawrence SAB 100% Renewable Energy DRAFT

C.4 STAFF REPORT:

C.5 FUTURE AGENDA ITEMS:
   a) Single-stream recycling and end markets- December
   b) Lawrence air quality analysis & Microplastics – December

C.6 MEMBER UPDATES:

D. PUBLIC COMMENT:

Public Comment: The Board shall allow public comment on items listed on the agenda. Each person will be limited to three (3) minutes for public comment. Members of the public may provide public comment on multiple agenda items. General public comment on items or issues that are not scheduled on the agenda may be made after all regular
business of the Board has been conducted. Each person will be limited to three (3) minutes for general public comment.

E. CALENDAR:

F. ADJOURNMENT
The purpose of the Sustainability Advisory Board is to advise the Governing Body of the City of Lawrence, Kansas, regarding issues affecting sustainability, environmental protection, waste reduction, recycling, energy conservation and natural resource conservation environmental protection.

MINUTES
October 9, 2019 – 5:30 pm
MEETING LOCATION: Parks and Recreation Administration Building in South Park, 1141 Massachusetts St, Lawrence, KS 66044

Members present: Jackie Carroll, Kay Johnson, Allison Koonce, Kira McPherson, Michael Steinle, Lei-Lei Mitchell, and Morgan Orozco
Members not present: Rachel Krause, Deb Ford, Ma’Ko Quah Jones
Staff present: Jasmin Moore, Kathy Richardson
Public present: Several members of the public were present

October 9, 2019 – 5:30 pm

I. SAB Administration:
   a. Introductions and new member, Morgan Orozco.
   b. Terms expire December 31, 2019 for four members and all are eligible for reappointment, if interested.

II. Discussion: Downtown pedestrian recycling containers (Morgan Orozco)
   a. Noticed that there is a problem with contamination of the recycling containers in downtown Lawrence. There is also not much content that qualifies as recyclables. Previously brought this up with the City Commission, and the issue was referred to the Sustainability Advisory Board.
   b. Staff update: Parks & Rec is responsible for collection of trash and recyclable material in downtown. A small scale audit of the downtown pedestrian recycling within the last year revealed a significant amount of contamination (trash mixed in with recyclable material). When there are events downtown the contamination rate can get up to 50%. On a normal week contamination rate is about 25%. This is very high compared to city-wide single stream recycling collection, which has a contamination rate below 6%. A best practice for public recycling is to include visual signage. However, there will still be contamination. Staff is working with HAAM to identify and pilot an alternative lids to the recycling containers in downtown.
III. CALL MEETING TO ORDER: Determine quorum of members. 5:54 pm

IV. Approve September meeting minutes. Motion by Michael, Second by Kira. Motion passed.

V. Discussion: Kansas City Climate Action Summit and Global Covenant of Mayors Climate Leadership Project Workshop
   a. Several hundred people attended the Climate Action Summit on September 14.
   b. The Global Covenant of Mayors for Climate and Energy (GCoM) is an international alliance of cities and local governments with a shared long-term vision of promoting and supporting voluntary action to combat climate change and move to an inclusive, just, low emission, resilient society. On October 1-2, 2019, the Mid-America Regional Council hosted a two-day workshop for stakeholders to kick off the process to develop a regional Climate Action Plan, including a Greenhouse Gas Inventory and Climate Risk and Vulnerability Assessment. See the presentations from those two days here. It is projected that a climate policy playbook for local governments will be published before the end of the year.
   c. Recommendation for Lawrence to join the Metro KC Climate Action Coalition is on the October 15 City Commission Agenda.

VI. Subcommittee report and discussion: Climate Action Planning
   a. Kira volunteered to be the chair of this subcommittee. Staff will coordinate with the members of the subcommittee to schedule a meeting before the November

VII. Staff Report
   a. SAB’s recommendation to the City to sign on to the Climate & Health Declaration is on the October 15 City Commission Agenda.
   b. Lawrence and Douglas County Sustainability Office new staff: Food System and Sustainability Analyst, Kim Criner Ritchie
   c. There may be an opportunity to collaborate with the Arts and Culture Commission on climate engagement. Two SAB members (Morgan & Kira) volunteered to participate in a brainstorming session about opportunities to connect art and climate. Staff will coordinate.
      i. City legal staff developed a legal opinion analyzing the city’s ability to implement a fee. The opinion states that the office believes that it may very well be possible to craft an ordinance so that the proposed $0.16 excise tax would constitute a lawful “fee” rather than an unlawful “excise tax.” However, there are a variety of challenges with the collection of a fee.
ii. Motion by Michael to submit a formal recommendation to the City Commission that the City of Lawrence implement a ban on single-use plastics as previously defined in the initial recommendation and in accordance with staff findings regarding fees. The reasons for the recommendation are well-documented in the initial Single-Use Plastics Report. Second by Morgan. Motion passed.

iii. Staff will continue to work on language and definitions in the development of an ordinance.

e. City Manager Craig Owens gave a 100 day report to the City Commission. Video is available here https://youtu.be/guWhQvlAFks starting at 4:14:00.

VIII. Key takeaways to share with the City Commission

IX. Future Agenda Items

a. Municipal Services & Operations Department: Introduce new staff, reorganization, relevant operations- November

a. 2018 energy code – November

b. Renewable Energy subcommittee- November

c. Single-stream recycling and end markets- December

d. Lawrence air quality analysis & Microplastics – December

e. Chair and vice chair elections- December

X. Member Updates

a. Jackie attended the City Commission meeting (10/8/19) about becoming a sanctuary city.

b. Michael will be the chair of the Food Policy Council for the remainder of the year.

c. Kay’s company, Prosoco, signed the Climate and Health Declaration.

d. Kay- Bat Week is coming up, October 24-21! Promoting bat health and habitat.

e. Morgan- Vice Chair of Kansas High School Democrats. Recently attended the Climate Strike. Working on movement to get more people under 20 on advisory boards.

XI. Public Comment

a. Citizens Climate Lobby, asking for guidance on how they might get an endorsement from the city for H.R.763 - Energy Innovation and Carbon Dividend Act of 2019 (federal bill). Carbon fee and dividend. KC has already endorsed it. Meeting with all the municipalities in Kansas City.

XII. Adjourn 7:34 pm.

Next regular SAB meeting: November 13, 2019 at 5:30 p.m.
Venue: Parks and Recreation Administration Building in South Park, 1141 Massachusetts St, Lawrence, KS 66044
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>TABLE OF CONTENTS</strong></td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>BACKGROUND</td>
<td>3</td>
</tr>
<tr>
<td>1.1</td>
<td>Definition</td>
<td>3</td>
</tr>
<tr>
<td>1.2</td>
<td>History in SAB</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>RECOMMENDATION</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>RESEARCH</td>
<td>4</td>
</tr>
<tr>
<td>3.1</td>
<td>Ready for '100</td>
<td>4</td>
</tr>
<tr>
<td>3.2</td>
<td>IPCC Report</td>
<td>6</td>
</tr>
<tr>
<td>3.3</td>
<td>Clean Energy Options</td>
<td>8</td>
</tr>
<tr>
<td>3.4</td>
<td>REN21 Global Future Report</td>
<td>9</td>
</tr>
<tr>
<td>3.5</td>
<td>Kansas Legislation</td>
<td>10</td>
</tr>
<tr>
<td>3.6</td>
<td>Other Municipalities</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>ENERGY &amp; EMISSIONS IN LAWRENCE</td>
<td>15</td>
</tr>
<tr>
<td>4.1</td>
<td>Consumption Overview</td>
<td>15</td>
</tr>
<tr>
<td>4.2</td>
<td>Renewables</td>
<td>15</td>
</tr>
<tr>
<td>4.3</td>
<td>Legislation</td>
<td>16</td>
</tr>
<tr>
<td>4.4</td>
<td>Utilities</td>
<td>16</td>
</tr>
<tr>
<td>4.5</td>
<td>Direct Renewable Participation Service Tariff (for Wind Energy) and Black &amp; Veatch Analysis</td>
<td>17</td>
</tr>
<tr>
<td>4.6</td>
<td>Greenhouse Gas Emissions</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>GOAL ALIGNMENT</td>
<td>20</td>
</tr>
<tr>
<td>5.1</td>
<td>Plan 2040</td>
<td>20</td>
</tr>
<tr>
<td>5.2</td>
<td>LEED for Cities and Communities (Formerly STAR Communities)</td>
<td>21</td>
</tr>
<tr>
<td>5.3</td>
<td>The U.S. Conference of Mayors Climate Protection Agreement</td>
<td>21</td>
</tr>
<tr>
<td>5.4</td>
<td>Climate Mayors (Paris Climate Agreement)</td>
<td>22</td>
</tr>
<tr>
<td>5.5</td>
<td>Climate Action KC</td>
<td>23</td>
</tr>
<tr>
<td>5.6</td>
<td>Climate + Health Declaration</td>
<td>23</td>
</tr>
<tr>
<td>5.7</td>
<td>Peak Oil Report 2011</td>
<td>23</td>
</tr>
<tr>
<td>6</td>
<td>CONCLUSION</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td><strong>APPENDIX I GOAL LANGUAGE EXAMPLES</strong></td>
<td>27</td>
</tr>
<tr>
<td></td>
<td><strong>APPENDIX II RESOLUTION “WHEREAS” AND RESOLUTION STATEMENTS</strong></td>
<td>27</td>
</tr>
<tr>
<td></td>
<td><strong>APPENDIX II RESOLUTION STATEMENTS</strong></td>
<td>27</td>
</tr>
</tbody>
</table>
CHAPTER 1  BACKGROUND

1.1 Definition
A community is powered with 100% renewable energy when the amount of energy generated from renewable energy sources in the community (or brought into it) equals or exceeds 100% of the annual energy consumed within the community. (Sierra Club, Ready for 100)

1.2 History in SAB
The first few mentions of a 100% renewable energy goal for municipalities within the Sustainability Advisory Board (SAB) were brought up in 2017 or 2018 as members updated the board on other, comparable cities setting the goal.

After the April 9 commission meeting where Sustainability Director Jasmin Moore presented the Climate Protection Plan and Sustainability Update, the board also received the presentation and discussed the commissioners’ reactions. Specifically, it was discussed that a 100% Renewable Energy policy would have a big impact in addressing the commission’s concerns about continuing to meet or beat the city’s greenhouse gas emissions reductions goal.

When the board officially set its 2019 goals in May, 100% Renewable Energy became a top priority.

A memorandum addressed to the city commission on April 10, 2019 and received at the May 7th commission meeting recommended that the Climate Protection Plan be updated. The recommendation included seven additional points relative to the plan including that the city “shall adopt a policy as soon as possible, and no later than December 2019, to achieve 100% use of renewable energy in all City functions by 2025.”

Click to see the Memo

CHAPTER 2  RECOMMENDATION

The Sustainability Advisory Board voted unanimously on November 13, 2019 to recommend that the City Commission adopt a policy to achieve use of 100% clean, renewable energy according to the following:

- by 2025 for electricity in municipal operations,
- 2040 for all energy sectors in municipal operations,
- 2035 for electricity community-wide, and
- 2050 for all energy sectors community-wide

Specifically, this policy should be informed by the following:

1. Given the short municipal timelines, the budget should begin to reflect the economic investment in the plan as soon as possible.

2. Participate in the Direct Renewable Participation Service Agreement as soon as possible. Staff should reach out frequently to express the desire to sign on rather than waiting for the utility to offer.

3. Prioritize the following:
   a. Energy reductions and increasing energy efficiency
   b. Truly clean renewable energy: Wind, solar, geothermal, hydro
   c. Equity affordability and access for all members of the community, prioritizing low income communities, environmental justice communities, and communities burdened by the
fossil fuel industry.

4. Annual review and adjustment of goal-fulfilling projects and financing to ensure goal achievement.

5. “All energy sectors” includes (but is not necessarily limited to): electricity, heating and cooling, and transportation.

6. Acknowledgement that some municipalities within the U.S. and globally will have to take on more than their fair share to compensate for those who do not adequately act.

7. A transparent and inclusive planning and implementation process that ensures community members and local businesses have many convenient opportunities to participate.

8. Via one of the following, identify a realistic implementation/transition plan to achieve the goals by the deadlines:
   a. the creation of a task force
   b. as a piece of the Climate Protection Plan update

9. A commitment to advocate for policies or regulations at the state, regional, and/or federal level that aid the city’s transition to renewable energy.

This policy is strongly recommended by SAB as a recognition of the critical condition of our planet and the need to protect it for our children and future generations. 137 cities, 11 counties, and 9 states/districts/territories in the United States have committed to this goal and 6 U.S. cities have already achieved it. While the opinion on exactly how long we have to eliminate the use of fossil fuels varies, it is consistently near-term – between 18 months to 30 years.

CHAPTER 3  RESEARCH

The City of Lawrence acknowledges the reality of climate change, that it is caused by human activity, and that action must be taken to both mitigate further destruction and prepare in order to ensure resilience. Weather is becoming more unpredictable, dangerous, and deadly. The oceans are warming and sea levels are rising at an alarming pace. We’ve already achieved a level of warming that cannot be reversed and must take dramatic action to prevent further warming and the resulting damage.

The following sections lay out several aspects of the conversation around renewables, why it’s necessary to take action, and what other cities are already doing to achieve this goal.

3.1 Ready for 100

“The Ready for 100 Campaign recognizes community commitments in places where a city’s leadership has established a goal to transition the entire community to 100% clean, renewable energy. This can be through a stand-alone Resolution or Proclamation, or integrated into a community’s Climate Action Plan or Energy Action Plan.” According to the website, “1 in 4 people in America now live in a community committed to a transition to 100% clean, renewable energy.” More specifically, it is 28% of the population.

If we apply that 28% to the adoption curve, as seen below, we’re already past the Innovators and Early Adopters and into the Early Majority. This is another opportunity for Lawrence to catch up to its progressive reputation.
137 cities, 11 counties, and 9 states/districts/territories in the U.S. have either committed to or already achieved 100% renewable energy. Section 3.6 of this document contains a review of Midwest cities that have signed onto the commitment as well as a summary of their timelines and strategies for achieving the goal.

Ready for 100 recommends the following elements be included in any 100% renewable energy goal:

- **Community-wide Electricity Use**: A full transition of the electricity sector to clean, renewable energy;
- **By 2035**: A target year for when this commitment will be achieved no later than 2035 for electricity and 2050 for all energy sectors;
- **Ensure Justice, Equity, Affordability, and Access**: A commitment should include measures that prioritize equity, affordability, and access for all members of the community, prioritizing low income communities, environmental justice communities and communities burdened by the fossil fuel industry.
- **Clean and Renewable Resources Only**: This includes carbon and pollution free energy sustainably collected from renewable sources including wind, solar, tidal, and geothermal. Low-impact, small hydro and some forms of biomass may be included after being evaluated for sustainability and environmental justice implications. Nuclear, natural gas, coal, oil based, or any other forms of carbon-based energy production are not included as clean or renewable sources of energy.
- **A Transparent and Inclusive Planning and Implementation Process** ensuring that the community members and local businesses have an opportunity to participate.

Goals that Ready for 100 consider strong also include the following:

- **All Energy Sectors**: A commitment to transition other energy sectors to 100% including transportation and heating and cooling;
- **A Local Generation Goal**: A goal for how much of the community’s energy needs will be met by local, distributed generation;
- **Near term implementation steps**: At least the first year and ideally a five-year plan;
- **Commitment to Collaboration**: A commitment to work with surrounding communities in achieving aligned clean energy and equity goals;
- **Commitment to Advocate**: A commitment to advocate for policies or regulations at the state, regional and/or federal level that aid the city in their transition.
3.2 IPCC Report

In October 2018, the UN Intergovernmental Panel on Climate Change (IPCC) released a report that stated “Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels (prior to large-scale industrial activity around 1750), with a likely range of 0.8°C to 1.2°C. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate” (italics original).

Media reports about climate change reaching disastrous levels in 12 years – those from which we could not recover – were discussed and shared widely on social media. The IPCC report also included the following points relevant to reducing greenhouse gas emissions and prioritizing clean renewable energy (section numbers included for easy reference). All are verbatim. Text in red is for emphasis on the takeaway message.

• A.2.2. Reaching and sustaining net zero global anthropogenic CO2 emissions and declining net non-CO2 radiative forcing would halt anthropogenic global warming on multi-decadal time scales. On longer time scales, sustained net negative global anthropogenic CO2 emissions and/or further reductions in non-CO2 radiative forcing may still be required to prevent further warming due to Earth system feedbacks and to reverse ocean acidification and will be required to minimize sea level rise.

• A.3.3. Adaptation and mitigation are already occurring. Future climate-related risks would be reduced by the upscaling and acceleration of far-reaching, multilevel and cross-sectoral climate mitigation and by both incremental and transformational adaptation.

• B.5.1. Populations at disproportionately higher risk of adverse consequences with global warming of 1.5°C and beyond include disadvantaged and vulnerable populations, some indigenous peoples, and local communities dependent on agricultural or coastal livelihoods.

• C.2.1. Pathways that limit global warming to 1.5°C with no or limited overshoot show system changes that are more rapid and pronounced over the next two decades than in 2°C pathways. The rates of system changes associated with limiting global warming to 1.5°C with no or limited overshoot have occurred in the past within specific sectors, technologies and spatial contexts, but there is no documented historic precedent for their scale.

• C.2.2. In energy systems, modelled global pathways limiting global warming to 1.5°C with no or limited overshoot generally meet energy service demand with lower energy use, including through enhanced energy efficiency, and show faster electrification of energy end use compared to 2°C. In 1.5°C pathways with no or limited overshoot, low-emission energy sources are projected to have a higher share, compared with 2°C pathways, particularly before 2050.

In 1.5°C pathways with no or limited overshoot, renewables are projected to supply 70–85% (interquartile range) of electricity in 2050. In electricity generation, shares of nuclear and fossil fuels with carbon dioxide capture and storage (CCS) are modelled to increase in most 1.5°C pathways with no or limited overshoot. In modelled 1.5°C pathways with limited or no overshoot, the use of CCS would allow the electricity generation share of gas to be approximately 8% (3–11% interquartile range) of global electricity in 2050, while the use of coal shows a steep reduction in all pathways and would be reduced to close to 0% (0–2% interquartile range) of electricity.

While acknowledging the challenges, and differences between the options and national circumstances, political, economic, social and technical feasibility of solar energy, wind energy and electricity storage technologies have substantially improved over the past few years. These improvements signal a potential system transition in electricity generation.
• C.2.6. Total energy-related investments increase by about 12% (range of 3% to 24%) in 1.5°C pathways relative to 2°C pathways. Annual investments in low-carbon energy technologies and energy efficiency are upscaled by roughly a factor of six (range of factor of 4 to 10) by 2050 compared to 2015.

• D.1.3. The lower the emissions in 2030, the lower the challenge in limiting global warming to 1.5°C after 2030 with no or limited overshoot. The challenges from delayed actions to reduce greenhouse gas emissions include the risk of cost escalation, lock-in in carbon-emitting infrastructure, stranded assets, and reduced flexibility in future response options in the medium to long term.

• D.2.3. Mitigation and adaptation consistent with limiting global warming to 1.5°C are underpinned by enabling conditions, assessed in this Report across the geophysical, environmental-ecological, technological, economic, socio-cultural and institutional dimensions of feasibility. Strengthened multilevel governance, institutional capacity, policy instruments, technological innovation and transfer and mobilization of finance, and changes in human behaviour and lifestyles are enabling conditions that enhance the feasibility of mitigation and adaptation options for 1.5°C-consistent systems transitions.

• D.3.3. A mix of adaptation and mitigation options to limit global warming to 1.5°C, implemented in a participatory and integrated manner, can enable rapid, systemic transitions in urban and rural areas. These are most effective when aligned with economic and sustainable development, and when local and regional governments and decision makers are supported by national governments.

• D.4.4. Mitigation consistent with 1.5°C pathways creates risks for sustainable development in regions with high dependency on fossil fuels for revenue and employment generation. Policies that promote diversification of the economy and the energy sector can address the associated challenges.

• D.7.4. Collective efforts at all levels, in ways that reflect different circumstances and capabilities, in the pursuit of limiting global warming to 1.5°C, taking into account equity as well as effectiveness, can facilitate strengthening the global response to climate change, achieving sustainable development and eradicating poverty.

It is important to note that since this report, several sources have warned that the opportunity for slowing or halting warming is even less than this report suggests and that estimates publicized in the past have been consistently more optimistic than what has come to pass.

In fact, a newly published statement, out November 5, 2019, written by dozens of scientists and endorsed by another 11,000 scientists across 153 countries, says, “The climate crisis has arrived and is accelerating faster than most scientists expected. It is more severe than anticipated, threatening natural ecosystems and the fate of humanity… To secure a sustainable future, we must change how we live. [This] entails major transformations in the ways our global society functions and interacts with natural ecosystems.” They say the required changes include ending population growth, leaving fossil fuels in the ground, halting forest destruction, and slashing meat eating.
3.3 Clean Energy Options

Based on Ready for 100’s recommendations, included is a review of only those sources regarded as carbon and pollution free energy sustainably collected from renewable sources. Wind, solar, tidal, and geothermal. Low-impact, small hydro, and some forms of biomass may be included after being evaluated for sustainability and environmental justice implications. Nuclear, natural gas, coal, oil based, or any other forms of carbon-based energy production are not included.

- **Wind**: Wind turns two or three propeller-like blades around a rotor of a wind turbine. The rotor is connected to the main shaft, which spins a generator to create electricity. (energy.gov)
  - In 2018, Kansas ranked among the top five states in total wind energy generation and had a larger share of electricity generated from wind energy (36%) than any other state. (eia.gov)
  - Kansas ranks second in technical potential for onshore wind power. (https://www.nrel.gov/docs/fy12osti/51946.pdf)

- **Solar/Photovoltaic**: Converting sunlight to electricity by allowing particles of light to knock electrons free of atoms, generating a flow of electricity. (livescience.com)
  - Kansas’ potential is tied at about 30th place in total estimated technical potential for rooftop photovoltaics.
  - The NASA Develop National Program is generating a draft report to determine solar feasibility in Lawrence for individual rooftops as well as potential sites for ground based solar farms. This data will serve as an extremely helpful tool in the transition to expand solar energy production in Lawrence.
  - Lawrence already has two successful solar system installer companies. Expanding solar generation in Lawrence will directly and positively impact these local businesses and ideally expand local employment in green energy.

- **Solar Thermal**: Low, medium, and high temperature collectors use the energy/heat from the sun for various uses including space & water heating, cooling, ventilation, drying, cooking, and distillation. **Concentrated Solar Thermal (CST)** and **Concentrated Solar Power (CSP)** are methods of generating solar thermal energy on a larger scale.

- **Geothermal**: Using heat from the Earth to warm water either on a large scale with a power plant or a small scale with a system for an individual building. (https://archive.epa.gov/climatechange/kids/solutions/technologies/geothermal.html)

- **Biomass**: Using resources like organic material (wood, grass, corn, etc.), biofuels (vegetable oil, biodiesel, etc.), solid waste, sewage, bioethanol, and landfill gas through combustion or steam to generate energy. (https://www.ovoenergy.com/guides/energy-sources/bio-fuels.html)
  - Debated on whether it’s really a clean form of energy because it emits more CO2 per MWh than coal and emits methane. Could also increase risk of deforestation.

- **Hydroelectric**: Moving water pushes turbines that spin a generator, producing electricity.

- **Tidal**: Moving water turns blades, much like wind turbines. Tidal barrages are another type of system where a structure that looks similar to a dam fills with the tide and generates power as it empties, and sometimes also when it fills. (https://www.eia.gov/energyexplained/hydropower/tidal-power.php)
Not an option for Lawrence

- Renewable Energy Credits (RECs):
  - Critics of such arrangements note that “it isn’t reasonable to say that purchasing a [credit] is equivalent to not polluting.” On the other hand, renewable energy credits also have significant benefits, including giving monetary value to the environmental virtues of clean energy and allowing economically efficient investment in renewable facilities.
  - Many municipalities using RECs as a component of their transition plan include the caveat that they should prioritize RECs that facilitate renewable energy generation projects locally.

3.4 REN21 Global Future Report

REN21 is the global renewable energy policy multi-stakeholder network that connects public and private sectors. REN21’s goal is to facilitate knowledge exchange, policy development, and joint action towards a rapid global transition to renewable energy.

The Global Future Report was commissioned by REN21, supported by the German Federal Ministry for Economic Cooperation and Development (BMZ), the German Federal Ministry for Economic Affairs and Energy (BMWi) and the World Future Council. Several regional stakeholders such as the Institute for Advanced Sustainability Studies (IASS), the National Renewable Energy Laboratory (NREL) and the Renewable Energy Institute (REI Japan) provided capacity, ensuring maximal outreach to experts. The report analyzes the views of 114 renowned energy experts from every region of the world, interviewed over the course of 2016. These experts shared their views on achieving 100% renewable energy by 2050:

- More than 70% of the experts interviewed consider a global transition to 100% renewable energy to be both feasible and realistic. Nearly 70% expect the cost of renewables to continue to fall, beating all fossil fuels within 10 years’ time. Wind and solar photovoltaic are in fact already cost-competitive with new conventional generation in most OECD countries.

- More than 90% agree that renewable energy technologies serve to lower the barrier for communities to gain access to energy services. An estimated 100 million people now receive electricity via distributed renewable energy systems, and markets for such systems are growing rapidly.

- In some regions, most notably Africa, the US, and Japan, experts were skeptical about reaching 100% renewable energy supply in their own countries or regions by 2050, largely due to the vested interests of the conventional energy industry.

- Regarding the transport sector, drop-in solutions will not be sufficient to achieve the necessary transformation such as the replacement of combustion engines with electric drives. According to the interviewed experts, a modal shift will be required, for example from road to rail. Finally, the lack of long-term policy certainty and the absence of a stable climate for investment in energy efficiency and renewables hinder development in most countries.

- Christine Lins, Executive Secretary of REN21: “This report presents a wide range of expert opinions, and is meant to spur discussion and debate about both the opportunities and challenges of achieving a 100% renewable energy future by mid-century. Wishful thinking won’t get us there; only by fully understanding the challenges and engaging in informed debate about how to overcome them, can governments adopt the right policies and financial incentives to accelerate the pace of deployment.”
3.5 Kansas Legislation

At the Kansas Renewable Energy Conference on October 3, 2019, Governor Laura Kelly announced that the development of a comprehensive statewide energy plan is to begin soon. The few details known include that “the plan will create more jobs and save Kansans money, while also helping the environment;” “work to lower electricity prices for Kansas residents, and provide them with more options for electricity.” (“Kansas governor announces new statewide energy plan,” KSNT.com; “Kansas Renewable Energy Conference held in the Little Apple,” wibw.com)

The following describes legislation at the state level that applies to renewable energy. (dsireusa.org)

**Net Metering (K.S.A. 66-1263, et seq.; K.A.R. 82-17-1, et seq.; K.S.A. 66-1,184):** Investor-owned utilities in Kansas are required to offer net metering, which credits customers who generate more electricity than they use in a monthly billing period. The estimated generating capacity of all net-metered systems may count towards the utility’s renewable capacity target under Kansas’s voluntary renewable portfolio standard (RPS) goal.

Additionally, utilities that provide retail electric services in Kansas—including investor-owned utilities, electric cooperatives (defined by K.S.A. 17-4603), non-stock member-owned electric cooperative corporations, and municipally-owned or operated utilities—are required to enter into a parallel generation contract with eligible customer-generators if requested by the customer. Electricity exported by the customer-generator to the utility is sold at a rate of 150% of the utility’s monthly system average cost of energy per kWh, and any electricity imported by the customer-generator from the utility is purchased at the retail rate.

**Renewable Energy Standards Act (H.B. 2369):** State RPS enacted May 2009. Changed to voluntary in 2015 which removed the penalty for not complying. Required the state’s investor-owned utilities and electric cooperatives to generate or purchase 20% of the affected utility’s peak demand from eligible renewable resources for each calendar year beginning in 2020.

**Renewable Energy Property Tax Exemption (Kansas Statutes 79-201, S.B. 91):** Exempts renewable energy equipment from property taxes with proper application process. Includes wind, solar thermal electric, photovoltaic, biomass, hydropower, geothermal, and landfill gas resources or technologies that are actually and regularly used predominantly to produce and generate electricity, all personal property used to collect, refine, and treat landfill gas or transport landfill gas from a landfill to a transmission pipeline.

**Solar Easements (Kansas Statute 58-3801 et seq.):** Parties may voluntarily enter into solar easement contracts for the purpose of ensuring adequate exposure of a solar energy system.

3.6 Other Municipalities

The summary of 18 Midwest cities that have committed to or achieved 100% renewable energy is in 3 parts. It will include a list of the cities included in the analysis, a summary of the goals, and strategies and tactics the cities identified for achieving the goals. APPENDIX I lists specific goal language from adopted polices, and APPENDIX II lists “whereas” and resolution statements from cities’ official resolutions to serve as a bank to inform final policy language for Lawrence.

**Municipalities**

- Evanston, IL
- Fayetteville, AR
- Fort Collins, CO
- Frisco, CO
- Golden, CO
- Kansas City, MO
- Lafayette, CO
- Longmont, CO
- Madison, WI

November 6, 2019
Goals Summary
- 15 of the 18 municipalities include community-wide goals; the remaining do not specify whether the goal is community-wide or for municipal operations only.
- Municipal-specific goals are pledged to be achieved on average by 2032 with a range of 2022 – 2040.
- Community-wide goals are pledged to be achieved on average by 2036 with a range of 2025 – 2050.
- 14 goals include electricity only or break out separate goals based on energy sector (i.e. heating, transportation).
- 6 goals specify all energy sectors will be powered by renewables.

Strategies and Tactics
These are taken directly from cities' resolutions, renewable energy transition plans, and sustainability plans. Their presence here does not indicate that they are recommended or even appropriate for Lawrence, but to show a full representation of the tools these cities are using. Some points that were repetitive were reduced, but there may still be some redundancy.

1. Reduce Energy Use/Improve Energy Efficiency
   - Make all new and existing city-owned facilities and assets more energy efficient.
   - Ensure that the city provides exemplary leadership in waste reduction, reuse, and recycling.
   - Improve vehicle efficiency, such as continuing to optimize the City’s fleet and procurement policies.
   - Energy efficiency upgrades and a dollar themselves system for community pool.
   - Replace street lights and municipal facility lights with LEDs.
   - Offer advising services, rebates, and grants to residents pursuing energy efficiency upgrades.

2. Increase Renewables in City Operations
   - Purchase 15 percent of the total electricity demand of the City to operate municipal buildings and facilities from renewable power sources. The City’s Climate Protection Plan currently has a target of 5 percent.
   - Prioritize the purchase or installation of clean energy to run City operations.
   - Create a green fleet city policy.
   - Expand the City’s clean, renewable electrical energy purchase as example to the community.
   - Promote solar-powered City infrastructure where feasible.
   - Maximize the amount of solar generation on City-owned facilities such as the Water Treatment reservoirs and large City-owned buildings.
   - Participate in renewable electricity programs.

3. Legislation, Pograms, Incentives, and Deregulation to Encourage Installation of New Renewable Energy Generation
   - Provide incentives for entire community participation including residential & commercial.
Chapter 5 – Conclusions and Recommendations

Single-Use Plastics Study and Policy Recommendations

- Implement residential solar building permit fee rebates and make available on all residential permits for a period of two years and provide upon project completion.
- Adopt C-PACE legislation, which enables owners of eligible commercial and industrial buildings to finance up to 100 percent of energy efficiency, renewable energy, and water conservation eligible improvements.
- Create rooftop solar program to encourage residents and businesses to install solar.
- Support development of community solar gardens and utility-owned distributed solar.
- Organize a bulk purchase program for reducing the cost of solar installations.
  - A bulk purchasing program creates discounts for new residential rooftop PV customers by offering a solar developer a ready portfolio of clients that reduces acquisition costs.
  - Bulk Purchasing of Solar PV with REC Donations - A REC-swap program creates a mechanism for residents and businesses to receive discounts on solar PV installations in turn for donating the RECs to CU Boulder
- Implement new construction requirements/incentives for installing solar and solar-ready buildings.
- Rewrite zoning codes and other regulations to permit district and decentralized energy generation and distribution systems.
- Permit and create incentives for decentralized renewable energy utilities (e.g., wind installations and solar canopies in mall parking lots, etc.) on public and private structures, while minimizing impact on existing architecture and historic areas.
- Collaborate with partners to decrease legislative and regulatory barriers to achieving 100% renewable electricity.
- Start a “Partners for a Clean Environment” business program offering advising services, rebates, and grants to businesses for energy efficiency upgrades.
- Adopt a general policy preference for energy sources located as close to the City as reasonably practical.
- Continue to pass improvements in building codes and zoning that support the town’s goals and advocate for these goals at the state level.
- Leverage grant opportunities and revenue streams from County programs and taxes to support the town’s goals.
- Leverage rebates, grants, and incentives for technology upgrades and installations.

4. Engage Local Utilities to Increase Adoption of Renewable and Clean Energy Options into Their Energy Supply Portfolio

- Advocate to increase utility company’s clean renewable energy portfolio.
- Engage at the federal level to encourage adoption and increase the thresholds of the EPA Clean Power Plan.
- Join current efforts to establish state policy supportive of GHG emission reduction strategies.
- Identify strategies that can help keep the utility relevant in an era of rapid utility model evolution including increased investment in more future-proof energy supplies such as solar and wind.
- Integrate utility services to support and finance solar installations.
- Encourage higher renewable energy content in the grid.
- Work with utilities, institutions, and businesses to authorize, facilitate, and design district-scale sustainable energy systems.
- Leverage the Energy Future Collaboration Initiative - Leverage the Memorandum of Understanding signed with Xcel Energy to advance Nederland’s goals.
5. Increase Local Renewable Energy Generation
   o Build or support onsite generation of renewable energy through sources such as wind, solar, and geothermal installations.
   o Increase the number of local solar PV installations.
   o Seek opportunities for local distributed generation resources such as combined heat and power and biomass in alignment with the CAP Framework.
   o Install solar on city facilities.
   o Initiate community solar gardens.
   o Facilitate large-scale solar photovoltaic systems, including community solar gardens, funded through power purchase agreements or aggregating purchases with several government agencies.
   o Use solar thermal as a green building strategy to reduce water and space heating demand.
   o Use geothermal, referring to ground source heat pump technology, for new and remodeled single structures.
   o Use biomass as a potential to utilize MillerCoors waste products or landfill methane capture
   o Build hydroelectric projects at the City’s reservoirs.
   o Build upon and expand existing city-owned solar and wind systems.
   o Continue to increase the number of Community Solar Garden subscriptions which will provide savings to offset the increased cost of Renewable*Connect Electricity or RECs.
   o Implement on-site solar where residents and small businesses install solar PV systems through the utility’s net metering processes, but do not enroll in the Solar*Rewards program so that RECs generated by the systems can count towards the town’s goal.
   o Investigate ways to increase on-site renewable energy generation, initially with City facilities and then within the community.
   o Prioritize local and micro-grid-based renewable energy projects over remote generation and transmission, and provide renewable energy and energy storage at key public facilities to reduce vulnerability to main electric grid failure.
   o Prioritize community-based development of renewable energy in the County and surrounding Counties.

6. Renewable Energy Credits
   o Buy Renewable Energy Credits
   o Prioritize renewable resources and programs over purchasing renewable energy credits (RECs) to reduce reliance on RECs during the transition to 100 percent renewable resources.
   o Continue to increase the purchase of Renewable*Connect Electricity or Renewable Energy Credits (RECs) from new wind and solar projects in the Upper Midwest, which will entail extra cost.
   o When purchasing RECs, prioritize those that generate new renewable energy in the state.

7. Prioritize Specific Energy Sources
   o Hydroelectric
   o Increase the diversity of the electricity supply by reducing the percentage contribution of coal-derived electricity to less than 60 percent by 2020, specifically by increasing solar and wind.
WindSource investment – paying a slight premium for electricity generated by regional wind farms
Fuel alternatives, including biofuel, electric, natural gas, and propane for transportation.
Build small-scale wind turbines.

8. Create Groups & Develop Transition or Resilience Plans
   - Form 100% Clean Energy Advisory Board. It is in the process of developing a plan by December 2018 to meet the clean energy goal through a transparent and inclusive stakeholder process which includes community members as well as representatives from various organizations.
   - Establish short term “Renewable Energy Technical Advisory Committee” (RETAC).
   - Undertake a follow-up feasibility study for and implement additional opportunities for onsite generation of renewable energy for municipal buildings and facilities.
   - Develop a Just Transition Plan that engages and works with low-income households and marginalized communities to develop a more equitable transition to 100% renewable electricity.
   - Develop a resiliency plan to deal with anticipated changes and severe climate events associated with climate change.
   - Amend and develop plans, ordinances, policies, and budgets to move the City toward being a 100% renewable energy and resilient city.
   - Support grassroots advocacy. It is a strong agent of change. Advocacy is a tool for educating the community and growing and sustaining momentum.
   - Participate in regional collaboration initiatives like Colorado Communities for Climate Action (CC4CA) to amplify the town’s voice at the regional and state levels.

9. Other
   - Divert urban organic wastes into fuel sources for local bio-digester energy production.
   - Increase green infrastructure.
   - Have consideration for widening public access to alternative fueling stations.
   - Work with local utilities and businesses to identify and rank various opportunities for greater biowaste-to-energy projects.
   - Prioritize energy resources and programs that benefit low-income residents and create more equity in energy use, rates and jobs in the community.
   - Create solar charging stations to recharge electric vehicles.
   - Encourage new above-grade parking facilities to have solar canopies or green areas on top level.
   - Collaborate with other public and governmental entities locally and regionally to facilitate all clean energy measures.
   - Aspen, Colorado is powered by 100% renewable electricity - a mix of approximately 53% wind, 46% hydropower, and the remaining 1% from solar and landfill gas.
   - As of 2013, Greensburg, Kansas is powered with 100% renewable electricity, 100% of which is from wind.
CHAPTER 4  ENERGY & EMISSIONS IN LAWRENCE

4.1 Consumption Overview

<table>
<thead>
<tr>
<th>Consumer Segment</th>
<th>MWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>507,134</td>
</tr>
<tr>
<td>Residential</td>
<td>384,530</td>
</tr>
<tr>
<td>Industrial</td>
<td>243,238</td>
</tr>
<tr>
<td>Municipal</td>
<td>34,423</td>
</tr>
<tr>
<td>Street &amp; Hwy Lighting</td>
<td>3,393</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,172,718</strong></td>
</tr>
</tbody>
</table>

(average annual consumption between 2014 & 2017)

Overall electricity consumption did not increase or decrease significantly from 2014 to 2017.

This area to be updated with natural gas consumption information

4.2 Renewables

This section will be updated with how much of Lawrence is currently powered by renewable energy sources, including residential solar and Bowersock.

On average, renewables accounts for 11% of energy consumption in the US.

The University of Kansas
By the end of 2020, 100% of electricity used on The University of Kansas Campus will be from wind energy. Cassidy Kuhn, the Energy Program Manager, confirmed that in KU’s fiscal 2019, about 46% of the Lawrence campus’ energy came from electricity and that the university is planning to explore more sustainable options for their natural gas and steam use as well.

A Westar wind farm being built in Nemaha County, Kansas will be the source. This was made possible by the same Direct Renewable Participation Service offer that was extended by Westar to the City.

According to the KU Lawrence Energy Master Plan from Fall 2018, the vision of the plan is “The KU Lawrence campus will be a leader in providing energy efficient, responsible, and cost effective operations.” The first goal is to reduce energy consumption which is aligned with best practice where energy use is decreased before investing in renewables. ([http://www.kansan.com/news/ku-works-to-improve-sustainability-on-campus/article_cb5e2396-e889-11e9-b71c-6390b166b665.html](http://www.kansan.com/news/ku-works-to-improve-sustainability-on-campus/article_cb5e2396-e889-11e9-b71c-6390b166b665.html))

### 4.3 Legislation

This section will be updated with city-specific legislation that incentivizes renewables.

### 4.4 Utilities

**Westar/Evergy**

In 2005, the equivalent to Evergy (Westar + KCP&L) generated <1% renewables energy and what they did produce was all wind. They are estimating that in 2020 26% of their generated portfolio will be renewables, 25% of which will be from wind. Retail sales of Evergy electricity show that renewables account for an even higher proportion than what is generated, at around 33%. That the utility is selling more renewables as a percent to total than they are producing is a big clue that demand is quickly shifting to renewable energy sources. In the same 2005-2020 timeframe, CO2 emissions are estimated to be down 43%. At the time of the report, they expected to add more than 500 additional megawatts of wind energy between 2018 and 2020.

**GENERATION BY FUEL TYPE**

A couple of relevant snapshots from the utility’s report follow.

“Evergy has invested, and will continue to invest, in grid resiliency. Much of Evergy’s infrastructure is aged, and grid resiliency efforts include building additional transmission and distribution lines, replacing aged infrastructure and proactively managing the vegetation that can damage systems during severe weather.”

“Evergy’s Clean Charge Network includes more than 1,100 electric vehicle charging stations covering the greater Kansas City metro area and much of eastern and eastern-central Kansas.”
Evergy 2018 Sustainability Report

Black Hills Energy
While Black Hills provides electricity for some customers, in Lawrence it is solely a provider of natural gas. They have a proactive multi-year capital investment plan to replace aging infrastructure which results in a reduction of greenhouse gas emissions. Additionally, they have a rebate plan available to residential and commercial customers which paid out $9 million in 2018. Unfortunately, and it is unclear why, none of these rebates were paid to Kansas customers. This is an opportunity to engage with the utility to find out why and how Lawrence can participate in these programs to reduce natural gas consumption.

Black Hills Environmental Responsibility Report

Bowersock Mills and Power Company
Bowersock is a locally owned low impact hydroelectric power plant capable of producing up to 7 MW of clean energy. In relation to the full 1.14 million MW of electricity that Lawrence consumes annually, it's not a significant part of the pie, but it is still meaningful. 7MW can power over 5,000 homes.

Bowersock cannot sell to local businesses under Kansas law; it can only wholesale its energy. Currently, they sell to Westar/Evergy; Kansas Power Pool (KPP), a consortium of small Kansas municipal utilities; and Kansas City Board of Public Utilities.

The Low Impact Hydropower Facility certification is a rigorous certification that requires 8 criteria (listed below) to be met. Only 151 facilities qualify.

- Ecological Flow Regimes
- Water Quality Protection
- Upstream Fish Passage
- Downstream Fish Passage and Protection
- Watershed and Shoreline Protection
- Threatened and Endangered Species Protection
- Cultural and Historic Resource Protection
- Recreational Resources

4.5 Direct Renewable Participation Service Tariff (for Wind Energy) and Black & Veatch Analysis

The City was approached by Westar with an opportunity to participate in a renewable energy program called the Direct Renewable Participation Service Agreement offered through a rider in its standard rate tariffs. There was a limited time in which to respond.

Unfortunately, through a mismanagement of the information surrounding the offer, it did not reach the City Commission with enough time to review and act on the offer but an analysis of the program was requested from Black & Veatch anyway under the expectation that a similar agreement would again be offered in the near future.

In the simplest terms, the analysis showed that the agreement would have provided a cost savings for the city in all of the past 5 years, at several participation level scenarios. For these reasons it is recommended to participate in the Direct Renewable Participation Service Agreement as soon as possible and that staff should reach out frequently to express the desire to sign on rather than waiting for the utility to offer.

Black & Veatch Report
Table 2-3: Projected Savings at Various Participation Levels

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRPS Cost</td>
<td>$435,197</td>
<td>$435,197</td>
<td>$435,197</td>
<td>$435,197</td>
<td>$435,197</td>
</tr>
<tr>
<td>RECA Cost</td>
<td>$244,541</td>
<td>$204,648</td>
<td>$207,390</td>
<td>$204,966</td>
<td>$212,311</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$679,738</strong></td>
<td><strong>$639,844</strong></td>
<td><strong>$642,587</strong></td>
<td><strong>$640,163</strong></td>
<td><strong>$647,508</strong></td>
</tr>
<tr>
<td><strong>Annual Savings</strong></td>
<td><strong>$151,315</strong></td>
<td><strong>$38,560</strong></td>
<td><strong>$26,337</strong></td>
<td><strong>$81,301</strong></td>
<td><strong>$87,734</strong></td>
</tr>
<tr>
<td>DRPS Cost</td>
<td>$507,730</td>
<td>$507,730</td>
<td>$507,730</td>
<td>$507,730</td>
<td>$507,730</td>
</tr>
<tr>
<td>RECA Cost</td>
<td>$146,789</td>
<td>$125,688</td>
<td>$130,468</td>
<td>$118,883</td>
<td>$125,156</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$654,519</strong></td>
<td><strong>$633,418</strong></td>
<td><strong>$638,196</strong></td>
<td><strong>$626,613</strong></td>
<td><strong>$632,885</strong></td>
</tr>
<tr>
<td><strong>Annual Savings</strong></td>
<td><strong>$176,534</strong></td>
<td><strong>$44,987</strong></td>
<td><strong>$30,727</strong></td>
<td><strong>$94,852</strong></td>
<td><strong>$102,357</strong></td>
</tr>
<tr>
<td>DRPS Cost</td>
<td>$580,262</td>
<td>$580,262</td>
<td>$580,262</td>
<td>$580,262</td>
<td>$580,262</td>
</tr>
<tr>
<td>RECA Cost</td>
<td>$49,037</td>
<td>$46,729</td>
<td>$53,546</td>
<td>$32,800</td>
<td>$38,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$629,300</strong></td>
<td><strong>$626,991</strong></td>
<td><strong>$633,808</strong></td>
<td><strong>$613,062</strong></td>
<td><strong>$618,263</strong></td>
</tr>
<tr>
<td><strong>Annual Savings</strong></td>
<td><strong>$201,754</strong></td>
<td><strong>$51,414</strong></td>
<td><strong>$35,116</strong></td>
<td><strong>$108,402</strong></td>
<td><strong>$116,979</strong></td>
</tr>
<tr>
<td><strong>Save at 0 MW Participation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRPS Cost</td>
<td>$652,795</td>
<td>$652,795</td>
<td>$652,795</td>
<td>$652,795</td>
<td>$652,795</td>
</tr>
<tr>
<td>RECA Cost</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Buyback Excess @ 80%</strong></td>
<td><strong>$(28,917)</strong></td>
<td><strong>$(23,686)</strong></td>
<td><strong>$(17,634)</strong></td>
<td><strong>$(35,917)</strong></td>
<td><strong>$(32,726)</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$623,878</strong></td>
<td><strong>$629,109</strong></td>
<td><strong>$635,161</strong></td>
<td><strong>$616,879</strong></td>
<td><strong>$620,069</strong></td>
</tr>
<tr>
<td><strong>Annual Savings</strong></td>
<td><strong>$207,176</strong></td>
<td><strong>$49,296</strong></td>
<td><strong>$33,763</strong></td>
<td><strong>$104,586</strong></td>
<td><strong>$115,173</strong></td>
</tr>
</tbody>
</table>
Folks in forecasting professions live by the mantra “past behavior is the best predictor of future behavior.” The retail price of electricity has not decreased with any significance since at least 2001 and has increased 45% since then. The few times decreases did occur in that time, it was at most reduced from 1.3% from a previous year. Based on this principle and data, the fear of being locked into a lower energy rate because a further decrease in retail energy costs may occur, is unfounded. In fact, reducing the risk of cost fluctuations to nearly zero is a valuable position for forecasters, including those who work on financial forecasts like budgets.

![Average retail price of electricity, annual](https://eia.gov

### 4.6 Greenhouse Gas Emissions

As Jasmin Moore, Sustainability Director, presented to the City Commission in April, Lawrence community-wide greenhouse gas (GHG) emissions were down 26% in 2017 from the 2005 baseline against the goal of 30% *despite an increase in population*. Municipal emissions were down 17% in the same timeframe.

Below is a comparison of the top three contributors to GHG emissions for the city and community-wide, from 2017 to the previous report in 2012. While the mix community-wide has not changed substantially, it is obvious that actions over the 5-year period had a significant effect on the municipal mix.

<table>
<thead>
<tr>
<th>2012</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Top 3 contributors - Community</strong></td>
<td><strong>Top 3 contributors - Community</strong></td>
</tr>
<tr>
<td>1. Commercial energy (35%)</td>
<td>1. Commercial energy (31%)</td>
</tr>
<tr>
<td>2. Residential energy (31%)</td>
<td>2. Residential energy (30%)</td>
</tr>
<tr>
<td>3. Transportation (17%)</td>
<td>3. Transportation (22%)</td>
</tr>
<tr>
<td></td>
<td>(Transportation emissions stayed relatively flat)</td>
</tr>
<tr>
<td><strong>Top 3 contributors - Municipal</strong></td>
<td><strong>Top 3 contributors - Municipal</strong></td>
</tr>
<tr>
<td>1. Buildings and Facilities (54%)</td>
<td>1. Water and Wastewater treatment (46%)</td>
</tr>
</tbody>
</table>
Chapter 5 – Conclusions and Recommendations  
Single-Use Plastics Study and Policy Recommendations

<table>
<thead>
<tr>
<th></th>
<th>Water and Wastewater treatment (28%)</th>
<th>Buildings and Facilities (36%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3. Vehicle Fleet (7%)</td>
<td>3. Vehicle Fleet (8%)</td>
</tr>
</tbody>
</table>

CHAPTER 5  GOAL ALIGNMENT

The intent of this chapter is to convey the appropriateness of the 100% Renewable Energy Recommendation within the context of the city’s long-range plans and previous actions and promises.

5.1 Plan 2040

Included are excerpts from Plan 2040 with which the recommendation aligns. Additionally, the chapter titled “The Environment and Natural Resources” was moved from the last chapter in Horizon 2020 up to Chapter 2 in Plan 2040, only after the introductory chapter, signaling its importance as well as prioritization of environmental stewardship throughout all other chapters. [Click here to see Plan 2040]

Introduction

“PLAN 2040 is a comprehensive guide that empowers our citizens to make our community vision a reality. It sets the foundation for the type of welcoming and sustainable community we truly want to be… It establishes policies that guide our future growth while preserving and enhancing the natural environment, improving public health and safety, and bolstering our economic vitality… Our citizens value preserving and enhancing the natural environment for our enjoyment and for future generations… We make Lawrence and rural Douglas County a place where creativity thrives, sustainability is a way of life, and community pride is contagious.” (Pages 2 & 3)

Chapter 2 Environment and Natural Resources

Goal 3. Manage air quality in the community to limit outdoor air pollution, excessive greenhouse gases, and indoor air pollution. (Page 14)

Action Item 3.3. Reduce toxic emissions in the community and comply with regional, state, and federal clean air regulations.

Action Item 3.6. Prioritize efforts to reduce greenhouse gas emissions in municipal operations. (Page 15)

Goal 6. Strengthen environmental protection through sustainable development of the built/urban environment. (Page 16)

Action Item 6.1. Adopt a climate change adaptation and mitigation plan incorporating potential climate change scenarios and identifying specific actions to reduce greenhouse gases, risk, and exposure to hazards.

Action Item 6.5. Promote sustainable building practices by leading and promoting green building standards and practices, and by creating incentives and reducing barriers to improve opportunities for distributed generation of renewable energy sources.

Chapter 6 Economic Development

Action Item 1.3. Recruit and attract new and developing green/ environmentally friendly jobs. (Page 58)

Action Item 5.5. Create and promote incentives for businesses transitioning to environmentally sustainable practices. (Page 60)
5.2 LEED for Cities and Communities (Formerly STAR Communities)

Included are excerpts from the “2016 STAR Certification Results, Opportunities, and Next Steps Internal Staff Report” with which the 100% Renewable Energy recommendation aligns. All action items are from the Climate & Energy goal area, in the Greening the Energy Supply objective, and are areas where the city did not achieve any points toward the overall 460-point or 4-star rating (out of a possible 720 points, 5 stars).

Click here to see more about Star

<table>
<thead>
<tr>
<th>Action Item Description</th>
<th>Lawrence STAR Grading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a policy to ensure that the local government’s transportation and non-transportation energy supplies increasingly come from renewable and alternative sources.</td>
<td>Did not submit</td>
</tr>
<tr>
<td>Remove zoning, height, and other regulatory restrictions on the development of small- and medium-scale renewable energy installations and alternative fueling systems.</td>
<td>Did not submit</td>
</tr>
<tr>
<td>Adopt a renewable energy or alternative fuel targets for locally owned facilities and vehicles.</td>
<td>Did not submit</td>
</tr>
<tr>
<td>Create incentive programs to support the development of renewable and alternative fuel infrastructure, such as electrical vehicle charging stations and small-scale solar projects.</td>
<td>Denied</td>
</tr>
<tr>
<td>Use a feed-in tariff or other financial mechanisms to increase the mix of renewable energy sources supplied to residents.</td>
<td>Did not submit</td>
</tr>
</tbody>
</table>

5.3 The U.S. Conference of Mayors Climate Protection Agreement

The United States Conference of Mayors is the official non-partisan organization of cities with populations of 30,000 or more. There are over 1,400 such cities in the country today. Each city is represented in the Conference by its chief elected official, the mayor.

The primary roles of the Conference are advocacy, best practices, business connections, promotion of cities, networking. The awards program offers over $1 million dollars in grant funding.

1,060 mayors have currently joined the U.S. Conference of Mayors’ Climate Protection Agreement.

Excerpted from page 5 of Lawrence’s 2009 Climate Protection Plan:

“in March 2006, former Mayor Dennis ‘Boog’ Hightberger signed on to the U.S. Conference of Mayors Climate Protection Agreement on behalf of the City of Lawrence, Kansas.

Under the Agreement, participating cities commit to take the following three actions:

1. Strive to meet or beat the Kyoto Protocol targets in their own communities, through actions ranging from anti-sprawl land-use policies to bike path development to public information campaigns;
2. Urge their state governments and the federal government to enact policies and programs to meet or beat the greenhouse gas emission reduction target suggested for the United States in the Kyoto Protocol—7% reduction from 1990 levels by 2012; and
3. Encourage the U.S. Congress to pass the bipartisan greenhouse gas reduction legislation, which would establish a national emissions trading system.

In order to advance these goals, the Mayor’s Task Force on Climate Protection (also known as the Climate Protection Task Force, or CPTF) was appointed in February 2008 to create a Climate Protection Plan for the City of Lawrence.”
5.4 Climate Mayors (Paris Climate Agreement)

Climate Mayors is a bipartisan peer-to-peer network of U.S. mayors working together to demonstrate leadership on climate change through meaningful actions in their communities, and to express and build political will for effective federal and global policy action. The Climate Mayors coalition has emerged as a key voice and demonstration of the ongoing commitment of U.S. cities to accelerate climate progress.

Mayor Leslie Soden signed onto a statement expressing support for the Paris climate agreement in June 2017 in response to the U.S. withdrawing from the agreement.

We Are Still In

A related campaign, “We Are Still In,” includes businesses, cities, counties, states, colleges and universities, cultural institutions, health care organizations, faith groups, and tribes who are committed to supporting the Paris Agreement goals. Lawrence is included in this list and the declaration of this campaign is below.

We, the undersigned mayors, county executives, governors, tribal leaders, college and university leaders, businesses, faith groups, cultural institutions, healthcare organizations, and investors are joining forces for the first time to declare that we will continue to support climate action to meet the Paris Agreement.

In December 2015 in Paris, world leaders signed the first global commitment to fight climate change. The landmark agreement succeeded where past attempts failed because it allowed each country to set its own emission reduction targets and adopt its own strategies for reaching them. In addition, nations - inspired by the actions of local and regional governments, along with businesses - came to recognize that fighting climate change brings significant economic and public health benefits.

The Trump administration’s announcement undermines a key pillar in the fight against climate change and damages the world’s ability to avoid the most dangerous and costly effects of climate change. Importantly, it is also out of step with what is happening in the United States.

In the U.S., it is local, tribal, and state governments, along with businesses, that are primarily responsible for the dramatic decrease in greenhouse gas emissions in recent years. Actions by each group will multiply and accelerate in the years ahead, no matter what policies Washington may adopt.

In the absence of leadership from Washington, states, cities, counties, tribes, colleges and universities, healthcare organizations, businesses and investors, representing a sizeable percentage of the U.S. economy will pursue ambitious climate goals, working together to take forceful action and to ensure that the U.S. remains a global leader in reducing emissions.

It is imperative that the world know that in the U.S., the actors that will provide the leadership necessary to meet our Paris commitment are found in city halls, state capitals, colleges and universities, investors and businesses. Together, we will remain actively engaged with the international community as part of the global effort to hold warming to well below 2°C and to accelerate the transition to a clean energy economy that will benefit our security, prosperity, and health.

An addendum was added in Summer 2018:
American communities are facing unprecedented impacts from climate disasters that science shows are increasing in frequency and severity. The global supply chains on which our communities and economy depend are also threatened, raising the need to increase our capacity to cope with and recover from impacts. Resilience to climate change must be prioritized by the federal government and at every level beyond the federal government. The signatories of We Are Still In share a commitment to elevating the attention and resources directed towards building climate resilience and enhancing the economic and environmental sustainability of the supply chains that power the U.S. economy. They also recognize that action towards meeting both the short- and long-term goals under the Paris Agreement must ensure the safety and prosperity of American communities and competitiveness.

5.5 Climate Action KC
On October 15, 2019, the Commission voted unanimously to join Climate Action KC (formerly Metro KC Climate Action Coalition) after receiving a recommendation from SAB to do so. The group’s goals include:

- Draft a regional Climate Action Plan
- Develop State legislative platforms for climate action
- Create a policy playbook of solutions that can be implemented by municipal elected leaders
- Facilitate an annual Climate Action Summit

The regional nature of this group’s work coupled with the impressive pace at which they are achieving their goals will provide many efficiencies for Lawrence.

5.6 Climate + Health Declaration
In November 2019, the same month this report was finalized, Lawrence became the first municipality to sign on to Climate + Energy Project’s Climate + Health Declaration after receiving recommendations from SAB and the Food Policy Council to do so.

“The Kansas Climate + Health Declaration aims to increase awareness of the impacts of climate change on public health, to increase civic engagement on climate action in Kansas, and to advance policies that build community resilience and safeguard the future of our state.”

Signing this declaration reaffirmed the City & Commission's commitment to take action on climate change issues now and into the future and gives a voice to our community as a whole at the state level.

5.7 Peak Oil Report 2011
The Lawrence Mayor’s Peak Oil Task Force was established by the City Commission in 2008 and was charged with:

- assessing Lawrence’s exposure to diminishing supplies of oil and natural gas and making recommendations to address vulnerabilities;
- seeking input on negative impacts of peak oil and proposing solutions;
- acquiring and studying data on the issues of peak oil and natural gas depletion and the related economic and societal consequences;
- developing recommendations regarding strategies the City can take to mitigate the impacts of declining energy supplies;
- developing an emergency plan, if deemed appropriate;
Click here to see the Peak Oil report

Several recommendations revolve around encouraging and increasing alternative and renewable energy sources. One of the report’s six key conclusions was “5. Lawrence should initiate adaptive measures before the need becomes severe.” The many recommendations are stated as complementary to those listed in the Climate Protection Plan since the recommendations in that report are equally as important and the issues overlap so strongly.

Relevant recommendations from the task force’s report include:

- **Energy Delivery Recommendations:**
  - Partner with the Chamber of Commerce and economic development interests to aggressively recruit businesses engaged in research and manufacturing of renewable energy technologies. (This is within the overall top 10 recommendations).
  - Create local incentives such as green tax abatements to attract firms specializing in renewable energy technologies.
  - Install shade structures at selective City parking areas and equip them with solar electric panels to charge batteries of plug-in electric vehicles and plug-in hybrid vehicles.
  - Adopt code provisions for solar access rights. The code would establish a definition of solar access, specifications for position and height of new construction and tree plantings, a “grandfather” clause for existing structures and trees, solar access code review for new situations, and a mechanism for dispute resolution. Such provisions would guarantee the rights of property owners to south-facing solar access that is clear and unobstructed by newly constructed or remodeled buildings and newly planted deciduous or coniferous trees. At present, the only provision for such solar easements are voluntary between private individuals and recorded with the Register of Deeds of Douglas County in accordance with KSA 58-3801.
  - Revise the Subdivision Regulations to require solar access, either by street orientation or building-on-lot orientation, so the longer building axis is orientated facing south.
  - Establish policies that determine the size and placement of wind turbines based on considerations particular to the functional needs of wind technology, rather than determined by size and height restrictions that apply to satellite dishes, microwave towers, and similar installations.
  - Revise the Street Tree Planting Policy so that the south faces of buildings are exposed for winter angle solar access and not blocked by tree limbs. (Because the sun is lower in southern sky in the winter, this revision would not mean similar solar exposure in other, warmer seasons.)
  - Request the Kansas Legislature to institute a renewable energy tax credit for individuals who buy such systems, similar to the federal tax credits and those of many other states.
  - Renegotiate the Lawrence solid waste contract between Hamm Sanitary Landfill and the City of Lawrence to include provisions for tapping and capturing methane gas for bottling and sales. Proceeds could be shared between both contractual parties, which could offset a portion of Lawrence solid waste fees.
  - Continue to expand public-private financing tools for renewable energy projects such as the Bowersock Mills hydroelectric North Powerhouse.
• Continue to pursue any funding sources (federal, state, or foundations) to implement energy conservation and renewable energy applications on all City of Lawrence facilities.

• Westar Energy should implement rebates for ratepayers to purchase and install renewable energy systems that will offset future generation capacity need. An example of rebates by utilities in other states is $1.50/Watt, not to exceed $7,500, for residential customers, and $1.50/Watt, not to exceed $37,000, for commercial customers.

• Buy renewable energy systems for all the benefits that will accrue, even without state tax credits or utility rebates. While the financial payback may be smaller than in some other states, regardless, a payback it is.

• Transportation Recommendations:
  o Increase the use of alternative power sources, including onboard solar panels for mobile electronics (e.g., radios, computers, and air conditioners) so that emergency vehicles don’t have run to continuously.

  o Begin converting the City vehicle fleet to plug-in electric vehicles.

  o Promote existing and new alternative fuel technologies (e.g., attract alternative fuel manufacturers and distributors).

  o Facilitate the zoning for and safety of locating battery exchange stations strategically throughout the city, for depleted electric vehicle batteries to be traded for fresh ones.

  o Legalize Neighborhood Electric Vehicles -- some models resemble golf carts -- for use on City streets with appropriate restrictions.

  o Promote conversion of diesel trucks and other commercial trucks to include a secondary power source (e.g., generator or electric plug-in) to run lights and air conditioning so that the primary engine need not idle to power these functions.

  o Continue to add new or replace older diesel buses with alternative fuel-using vehicles such as electric, hybrid-electric, and natural gas.

  o Support innovative efforts to develop alternative fuel sources, including natural gas and electric motors.

  o Support the creation of governmental/non-governmental entities to locate charging stations for electric vehicles and plug-in hybrid vehicles. If feasible, facilitate the permitting of solar photovoltaic panels or urban-scale wind turbines in such stations.

  o Work with Westar Energy to facilitate “smart garage” programs, with smart meters and electric vehicle charging stations located in home garages.

  o Provide incentives for using for electric vehicles and plug-in hybrid vehicles, including designating special reserved parking locations or parking ticket abatement.
CHAPTER 6 CONCLUSION

It is clear from the many tools Lawrence uses to guide its future and benchmark progress on sustainability that setting a 100% Renewable Energy Goal is in line with the spirit of the city and its vision for the future.

There are seemingly infinite combinations possible to achieve the 100% renewable goal. The next time a program like the Direct Renewable Participation Service Agreement is available from Evergy, the City could achieve 100% renewable energy for all municipal electricity at a cost savings. That’s a bit counter to the usual assumption that renewable energy always comes with a huge premium and that it’s slow to achieve.

Fortunately, cities that commit to 100% renewable energy don’t have to know exactly how to achieve it before passing a resolution. This is evident from the many cities that have included in their resolutions that transition plans will be completed within the near future. SAB’s recommendation does not include a feasibility study for this reason. This document shows that it is feasible, next we must commit, then develop a plan for achieving it.

While it is positive that state legislation conducive to a renewables-heavy portfolio is likely forthcoming, it is no reason for Lawrence to wait, simply another piece of evidence that the goal will be achievable. This is further an opportune time to pass the resolution due to the City’s budget allocation to the Climate Protection Plan update for 2020. Several resources are already falling into place to contribute to updating the plan. It’s entirely reasonable to include a 100% Clean Renewable Energy Transition Plan within the work of the Plan update to efficiently leverage those resources.

It’s prudent to analyze potential unintended consequences of any policy adoption. It may be difficult to achieve the goal, and while the obvious intent is to stay on track, there are no direct penalties or repercussions for not achieving the goal. However, it’s necessary in this time to take bold action in order to achieve our best. Lawrence is small on the global scale, but we still have to do our part.
APPENDIX I GOAL LANGUAGE EXAMPLES

Goals for each of the 18 Midwest cities that have committed to 100% clean renewable energy are below.

1. 100% clean, renewable electricity community-wide by 2030 and carbon neutrality across all sectors by 2050.
2. Powering all government operations with 100% clean energy by 2030 and the entire community by 2050.
3. 100% clean, renewable electricity community-wide by 2030. Carbon neutral by 2050.
4. 100% clean, renewable electricity community-wide by 2035.
5. 100% clean, renewable electricity community-wide by 2030 and 100% renewable energy for heating and transportation by 2050.
6. 100% clean, renewable energy community-wide.
7. 100% renewable energy for electricity by 2030.
8. 100% clean, renewable electricity city-wide by 2030.
9. 100% renewable electricity community-wide by 2050.
10. 100% renewable energy sources for electricity for city operations by 2035, all city energy needs & community-wide electricity by 2040, all energy needs community-wide by 2050.
11. 100% renewable electricity for municipal facilities and operations by 2022, and 100% renewable electricity for community-wide by 2030.
12. 100% renewable energy (for all sectors) for municipal operations by 2040 & community-wide by 2050.
13. 100% clean, renewable electricity community-wide by 2025.
14. 100% clean energy in the form of wind, solar, energy efficiency measures and other renewable sources within the electricity sector by 2035 and all energy-use sectors including heating and transportation by 2050.
15. transitioning to a healthy, affordable 100% renewable energy system with greater community control and equitable access by 2035.
16. 100% clean electricity in the form of wind and solar and energy efficiency measures by 2035.
17. As of 2015, Aspen, Colorado is powered by 100% renewable electricity - a mix of approximately 53% wind, 46% hydropower, and the remaining 1% from solar and landfill gas. Pledged for community-wide.
18. As of 2013, Greensburg, Kansas is powered with 100% renewable electricity, 100% of which is from wind. Pledged for community-wide.

APPENDIX II RESOLUTION “WHEREAS” AND RESOLUTION STATEMENTS

A list of “whereas” and resolution statements from cities’ 100% renewable energy resolutions to serve as a bank to inspire and inform final policy language. Specific reference to city or utility names have been removed. This is not a comprehensive list including all Midwest cities’ resolutions, merely a sample of four.

Whereas Statements

- WHEREAS, the city is committed to creating a vibrant future for our community by taking responsible and effective action to arrest global warming and become resilient to the devastating risks of climate change on our health and well-being, ecosystems and economy;
• WHEREAS, the Mayor is a 2017 signatory to the Climate Mayors’ Pledge to adopt and uphold the Paris Climate Agreement to limit global temperature rise to 1.5 degrees Celsius;

• WHEREAS, the City has been committed to reducing its carbon footprint since resolving in 2010 to generate 25 percent of its energy from renewable sources locally by 2025 as an Energy Independent Community;

• WHEREAS, the City adopted a Comprehensive Plan in 2014 and a Sustainability Plan in 2015 that addresses climate change, is a partner in the County Energy and Climate Commission to move deep decarbonization County-wide, and is developing a comprehensive clean energy action plan in 2019;

• WHEREAS, the City has installed solar energy projects on four of five of its largest City-owned building rooftops;

• WHEREAS, the City is committed to ensuring all residents enjoy the benefits of energy efficiency and renewable energy, electrified transportation, fair utility rates, and employment opportunities of a clean energy economy;

• WHEREAS, youth and future generations will be most severely impacted by climate change, and it is the duty of current leaders to act promptly and resolutely to mitigate climate change for their benefit;

• WHEREAS, the City acknowledges that low-income residents and other vulnerable communities are often most burdened by energy rates and climate impacts;

• WHEREAS, the economic impacts of severe climate events will become unaffordable to taxpayers as the August 2018 flooding clearly demonstrated, so that mitigating climate change while improving the resilience of City infrastructure is the prudent, fiscally responsible thing to do;

• WHEREAS, climate scientists agree unequivocally that local climate change impacts will continue to include increasingly severe and more frequent droughts, worsening heat waves, excessive flooding, dieback of native tree species, reduced winter sports opportunities, increased prevalence of algal blooms on area lakes and ponds; and loss of suitable trout stream habitat;

• WHEREAS, community-based, regenerative environmental infrastructure development can benefit the entire City, and positively enhance our ecosystems, provide jobs, add to economic activity, and provide equity benefits;

• WHEREAS, use of distributed solar and other renewable energy sources, paired with energy storage, and backed up by renewable co-generation, is an important strategy to build disaster resilience in the City;

• WHEREAS, the City’s energy use could be served by existing energy technologies at reasonable cost, and the economic opportunities from a clean energy transition greatly exceed any economic opportunities from fossil fuels;

• WHEREAS, given the accelerating rate of climate change, as detailed in the IPCC Special Report on Global Warming SR15 and in the Fourth National Climate Assessment, it is urgent that energy consumers, the City, and the utility serving the City must take strong, swift action to reduce carbon emissions, and shift to 100 percent renewable electricity by 2030, which is within practical and economic reach;

• WHEREAS, the utility provider, which has pledged to increase its energy mix to at least 30% renewable energy by 2030 with at least an 80% reduction in carbon dioxide emissions by 2050 from 2005 levels, will be a key partner in creating additional cost-effective renewable energy generation, electrified transportation, energy efficiency improvements, and a progressive grid to assist the City in achieving its clean energy and resilience goals;

• WHEREAS, achieving these energy goals will require concerted action from individuals and the community, in urban and rural areas county-wide, from local and state governments, and from businesses and utilities;

• WHEREAS, the City ballot referendum results on climate change in November 2016 showed a strong 81 percent mandate from our residents in support of mitigating climate change;

• WHEREAS, the mayor is a 2017 signatory to the Mayor’s Pledge to support the Paris Climate Agreement;
WHEREAS, the City has been committed to gradually reducing its carbon footprint since resolving to become an Energy Independent Community in 2008;

WHEREAS, the City intervened in the utility’s 2014 rate case to support electric rates that encourage energy efficiency and renewable energy that are fair to all users;

WHEREAS, the City has installed solar energy projects at City-owned buildings and cooperate with the utility to install a large community-solar array to provide clean electricity to its residents and businesses on the Operations Center roof;

WHEREAS, low-income residents are often most burdened by energy rates and climate impact and the City is committed to ensuring all residents enjoy the benefits of energy efficiency and renewables, electrified transportation, fair utility rates, and employment opportunities;

WHEREAS, in 2016, 88 percent of electricity delivered to the City’s consumers by the utility was generated from fossil fuels – 68% coal and 22% natural gas (vs. the national average of 40% coal and 35% natural gas);

WHEREAS, virtually the entire world united in December 2015 with the Paris Climate Agreement to agree to attempt to limit global temperature rise to 1.5 degrees C; yet, federal and state government have since withdrawn from the Paris Climate Agreement and deny the urgency of climate change;

WHEREAS, the Town wishes to promote the public health and safety of its residents and visitors, including access to clean air, water, and a livable environment;

WHEREAS, there is scientific consensus regarding the reality of climate change and the recognition that human activity, especially the combustion of fossil fuels that create greenhouse gases, is an important driver of climate change;

WHEREAS, climate change is locally expected to shorten our ski season, make our forests more prone to drought and wildfire, reduce snowpacks and water supplies, and present a variety of other threats on a global scale that could harm our economy, safety, public health, and quality of life;

WHEREAS, the Town remains committed to its adopted goals to reduce energy consumption as outlined in the Conservation Center’s Climate Action Plan;

WHEREAS, the transition to a low-carbon community reliant on the efficient use of renewable energy resources will provide a range of benefits including improved air quality, enhanced public health, increased national and energy security, local green jobs, and reduced reliance on finite resources;

WHEREAS, the Town is committed to helping facilitate this transition alongside other national and international communities that have prioritized addressing climate change by investing in clean energy to enhance the well-being of current and future generations;

WHEREAS, the Town’s current stable economy is based on it being a highly-visited destination and we have an opportunity to broadly influence dialogue on climate change;

WHEREAS, the Mayor signed the U.S. Mayor’s Climate Protection Agreement, which suggests the City would uphold the commitment to the goals enshrined in the Paris Climate Agreement, increase investments in renewable energy and energy efficiency and increase efforts to cut greenhouse gas emissions and create a clean energy economy;

WHEREAS, the Town desires to work in partnership with its utility provider to move toward 100 percent renewable energy sources in the future;

WHEREAS, although it is the Town’s desire to reach 100% renewable electric energy by 2035, it is recognized that there may be obstacles that prevent the Town from reaching the full 100% goal. If the efforts of the utility and the Town fall short of the 100% target, nothing in this resolution suggests any penalty for not meeting the goal—and it should not be considered a failure, but merely a setback that delays the time when the Town ultimately reaches the goal, in a fiscally responsible manner for our citizenry;

WHEREAS, “renewable energy” includes energy derived from wind, solar, geothermal, and other non-polluting sources that is not derived from fossil or nuclear fuel and does not adversely impact communities or the environment;
• WHEREAS, the public will continue to be provided opportunities and encouraged to participate in the process for planning and implementation of renewable energy initiatives;
• WHEREAS, the City Council adopted a Sustainability Plan on November 29th, 2016 to promote social equity, environmental stewardship, and economic vitality for all residents and businesses of the City;
• WHEREAS, the City’s Mayor made a proclamation in support of achieving 100% renewable energy on December 5, 2017, renewable energy being defined for the purposes of this resolution as existing hydroelectric generation, solar generating technology, wind turbines, geo-thermal energy, tidal energy and other means that may become available that do not burn fossil fuels or other carbon based fuels and do not add greenhouse gases to the atmosphere;
• WHEREAS, the utility played an instrumental role in the creation of the Power Authority, one of the most successful examples of regional collaboration in the state, providing the City highly reliable electricity at the lowest wholesale cost in the state;
• WHEREAS, the utility is to be commended in their efforts to balance financial stability, reliability and environmental stewardship;
• WHEREAS the utility commissioned a zero net carbon study that demonstrated there was a low-cost alternative that would achieve zero net carbon and decommission its coal plants by 2030;
• WHEREAS conserving energy can be a lower cost alternative to increasing generation regardless of the energy source and the utility is best positioned to study demand patterns and utilize demand management, load balancing, and conservation technologies along with continuing to implement residential and commercial energy efficiency programs that will continue to improve energy efficiency and conservation;
• WHEREAS, it is critically important to be economically responsible, so that the City can continue providing affordable energy to our most vulnerable residents, those on fixed incomes, including the elderly and working families;
• WHEREAS, it is also important to provide reliable, high quality and affordable energy to attract and retail local businesses and spur economic development which is vital to our community’s success in a highly competitive and increasingly global marketplace;
• WHEREAS, the utility has recently demonstrated that it can purchase renewable energy at a cost that is commensurate to power generated with coal and natural gas;
• WHEREAS, the technologies associated with batter storage are continuing to develop rapidly in terms of capacity, life-expectancy, and affordability presenting the opportunity to utilize battery storage alongside renewable energy sources by 2030;
• WHEREAS, based on the utility’s Zero Net Carbon Study and their presentation to the City Council, we are confident and hopeful that technological advancements will provide increasing opportunities to incorporate more renewable energy into their electric generation resource mix without significantly impacting the affordability and reliability of that energy;
• WHEREAS, burning natural gas releases carbon dioxide into the atmosphere and the extraction process to obtain that natural gas can release methane into the atmosphere, thereby adding twice to the burden of greenhouse gases in the environment;
• WHEREAS, we all appreciate the beauty of the state and our wonderful community and want to protect and ensure such beauty will be enjoyed by future generations;
• WHEREAS, minimizing our community’s impact on the environment is a goal for which our community should continuously strive to achieve;

Resolution Statements
Each statement begins with “NOW, THEREFORE, BE IT RESOLEVD” or “BE IT FURTHER RESOLVED” in the original resolutions.
by the Common Council of the City, County, State, the City affirms its ongoing commitment to
tensify its action to meet the greenhouse reduction goals of the Paris Climate Agreement, and
opposes the rollback of science and climate policy at the federal and state levels;
that, given energy efficiency is a key and economical choice for meeting energy needs and
reducing our carbon footprint, the City will advance energy efficiency and conservation projects,
programs and outreach;
that the City will increase green infrastructure such as urban tree canopy, green streets, green
roofs, electric vehicle charging stations, and bike and pedestrian infrastructure as an effective
strategy to reduce energy consumption and increase public health and well-being along with
other climate resiliency strategies;
the City will meet its 100% renewable energy goals for city operations including buildings,
infrastructure and fleet by:
  a. reducing its energy use for city operations by at least 15% by 2030, 40% by 2040 and
      50% by 2050; and
  b. meeting 35% of its electricity needs for City operations through renewable energy
     sources by 2025 and 100% by 2030; and
  c. meeting 65% of all City operations energy needs with renewable energy by 2030, 85% by
     2035, and 100% by 2040;
the City will work to achieve its 100% renewable energy goal community-wide by establishing
goals with increasing targets to:
  a. reduce community-wide energy use at least 10% by 2030, and 40% by 2050; and
  b. meet 35% of community-wide electric needs through renewable energy resources by
     2025, 50% by 2030, 75% by 2035, and 100% by 2040; and
  c. meet 20% of community-wide energy needs with renewable energy by 2030, 80% by
     2040, and 100% by 2050;
the City will support energy resources and programs that benefit low-income residents and create
more equity in energy use, rates and jobs in the community;
the City will prioritize renewable resources and programs during the transition to 100 percent
renewable energy; and, when purchasing renewable energy credits (RECs), will prioritize those
that generate new renewable energy in the State;
the City will prioritize community-based development of renewable energy in the County and
surrounding counties;
the City will collaborate with other governmental and public entities locally and regional to
facilitate all clean energy measures;
the City will prioritize local and micro-grid-based renewable energy projects over remote
generation and transmission, and provide renewable energy and energy storage at key public
facilities to reduce vulnerability to main electric grid failure;
the City will develop resiliency strategies to deal with anticipated changes and severe climate
events associated with climate change;
that this resolution requires that the Mayor, City Council, Committees, Commissions and staff
actively reduce climate change impacts by amending and developing plans, ordinances, policies
and budgets to move the City toward being a 100% renewable energy and resilient city in order to
create a healthier, safer, and more prosperous community;
that given energy efficiency is the City’s first and most economical choice for meeting energy
needs and reducing our carbon footprint, the City will prioritize energy efficiency and conservation
projects, programs and outreach;
that the City will increase green infrastructure such as urban tree canopy, green streets, green
roofs, electric vehicle charging stations, and bike and pedestrian paths as an effective strategy to
reduce energy consumption and increase public health and well-being along with other climate
resiliency strategies;
• the City will reduce its energy use for city operations at least 15% by 2030, and 50% by 2050;
• the City will work to reduce community wide energy use at least 10% by 2030, and 40% by 2050;
• the City will meet 25 percent of its electric needs for City operations through renewable energy resources by 2025, 80 percent by 2030, 100 percent by 2035;
• The Town establishes a goal to achieve 100 percent renewable electricity community-wide by the year 2035, and is committed to working in partnership with Xcel Energy towards this goal. On an annual basis, the Town Council will review progress towards the communitywide 100 percent renewable goals and other relevant information (e.g., utility rates).
• Should the Town Council determine that customer utility costs have or are projected to increase at an unacceptable rate because of a transition to renewable energy, the Town Council may repeal this resolution or modify the goal set forth in Section 1 (e.g., 100 % renewable energy community-wide by 2035).
• the City establishes goals to meet 66 percent of all City, operations energy needs with renewable energy by 2030, 88 percent by 2035, and 100 percent by 2040;
• the City establishes goals with increasing targets to meet 20 percent of community-wide electric needs through renewable energy resources by 2025, 66 percent by 2030, 88 percent by 2035, and 100 percent by 2040;
• the City establishes goals to meet 21 percent of communitywide energy needs with renewable energy by 2030, 80 percent by 2040, and 100 percent by 2050;
• the City will prioritize energy resources and programs that benefit low-income residents and create more equity in energy use, rates and jobs in the community;
• the City opposes the rollback of science and climate policy at the federal and state levels and affirms its ongoing commitment to the goals of the Paris Climate Agreement and the City’s responsibility to meet its greenhouse gas reductions based on the Paris Climate Agreement; and
• the City will prioritize renewable resources and programs over purchasing renewable energy credits (RECs) to reduce reliance on RECs during the transition to 100 percent renewable resources;
• the City will prioritize community-based development of renewable energy in Dane and surrounding Counties;
• the City will collaborate with other governmental and public entities locally and regionally to facilitate all energy measures;
• the City will prioritize local and micro-grid-based renewable energy projects over remote generation and transmission, and provide renewable energy and energy storage at key public facilities to reduce vulnerability to main electric grid failure;
• the City will develop a resiliency plan to deal with anticipated changes associated with climate change;
• the City Council establishes the city-wide goal of consuming only electricity generated by means of carbon-free generation methods in our collaborative effort to achieve the goal of 100% clean, renewable electricity supply by the year 2030, with the intermediate goal of exceeding 50% carbon-free electricity by 2022;
• The utility in collaboration with the Power Authority will continue to prudently and creatively develop and refine demand side management strategies and energy efficiency programs in an effort to help control costs as more carbon-free energy technologies are integrated into our resource mix;
• The utility and Power Authority will provide reports to the City Council at least annually that will include appropriate metrics and benchmarks as progress is made toward achieving our goals;
• The City shall consider the needs of lower income residents and work to help minimize the impacts of any needed future energy rate adjustments;
• The City Council, in support of the City's Sustainability Plan, shall encourage commercial entities, developers and residents to invest in energy efficient technologies for their homes, offices, manufacturing facilities and transportation.