Meridian Climate Sustainability Report #1

Photo of Meridian's new 20 kilowatt photovoltaic array
by Roger Eberhardt, Meridian Energy Team

(draft 1/22/19)

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Contents

Meridian Climate Sustainability Report

The Meridian Township Board approved a Climate Sustainability Plan in October 2017. The following is a report on progress during 2018.

Energy Efficiency

Energy efficiency improvements included both lighting and improvements to the heating, ventilation, and air conditioning systems (HVAC). For example, twenty-four 250-watt soffit lights with 21.7 watt LEDs in the Municipal Building. Currently, Meridian is also replacing older computers and monitors. This process is 1/3 complete (50 of 150 computers). Newer monitors are approximately 15% more efficient with increased size. Newer CPUs are about 50% more efficient based upon watt-meter testing. Finally, a new condensing unit and coil were installed in the public safety building.

Energy efficiency improvements have continued in the Meridian street lighting system. Older mercury vapor lamps are being replaced with high pressure sodium and LEDs are being considered in other locations. Meridian is also partnering with a "Municipal Coalition" to help ensure desirable pricing for more efficient, longer lasting, and brighter replacements. This coalition included Grant Rapids, Kentwood, East Lansing, Flint, Meridian Twp., and others.

The installation of smart meters was largely completed during 2018. Smart meters allow many benefits including the potential to better track and manage energy usage. Smart meters are also an important step toward creating a Smart Grid, improving utility-wide reliability and ability to avoid the use of less efficient power plants, especially when coupled with time-of-use rates and other demand management technologies. In 2019, an engineering study is planned for the Municipal Building HVAC system.

Approximately $103,000 of energy improvements installed in Township buildings in 2011 continues to save the Township approximately $30,000 annually.

Renewable Energy

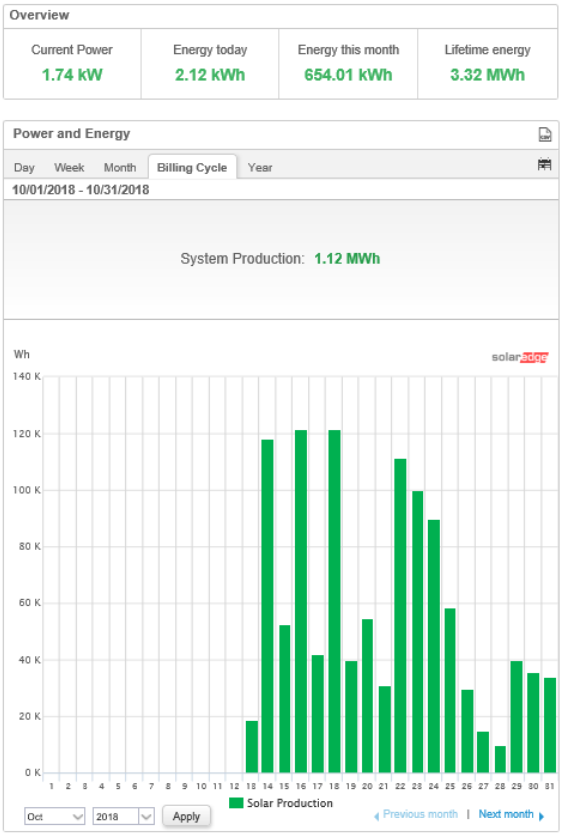
The Plan includes a commitment to obtain 100% of the township government's electricity from renewable energy by 2035 and 25% of the total community electricity from renewable energy by 2025. In pursuit of the community goal, the Meridian Energy Team developed a workshop program to encourage and make it easier for homeowners, businesses, and churches to install solar electric systems on their buildings.

The Meridian Energy Team worked with the Lansing Area Solar Users Network (LaSUN) and local civic organizations and houses of worship. There were 11 workshops held in Meridian Township, East Lansing, and Lansing that reached 272 persons. In addition, there was a workshop in Delta Township that reached 18 persons. There was a significant increase, 19 new solar projects (88.6 kW), in residential solar electric systems in Meridian Township in 2018. The number of residential solar systems doubled. While not all the new installations should probably be attributed to the Solarize Meridian project, it is reasonable to assume that the project was a major influence in increasing the number of solar installations in the township.

A major milestone was the installation of a 20 KW photovoltaic system at the corner of Marsh and Central Park Drive. This system will provide approximately 8% of the electricity needs of the Municipal Building, based upon historical usage patterns and average weather conditions. More detail about this system (including real-time solar energy production) can be found at http://bit.ly/meridiansolar. The following chart illustrates electricity production for the past few months. The system became operational on Oct 13 2018.

Energy Production

Month	Energy (Wh)
10/1/2018	1120070
11/1/2018	729252
12/1/2018	819889
1/1/2019	654158



Historical and real-time solar energy production displayed at http://bit.ly/solarmonitor

Recycling & Waste Reduction

Meridian Green Team was active in planning and coordinating two major regional recycling events during the spring and the fall. Each event drew hundreds of participants and resulted in the recycling, reuse, and proper disposal of 100,000 lbs. of materials. 1600 vehicles dropped off recyclables and over 180 volunteer shifts were filled.

The Green Team also promoted recycling in the broader community including multi-family apartment buildings and complexes. Surveys were distributed to owners and managers to gain insight on recycling views, barriers, and opportunities.

Participation in curbside recycling continues to grow slowly. Global markets for certain materials have put a strain on recycling processors and have resulted in a push to reduce contamination through programs like “Recycle Right” and others. During 2018, Granger reports the collection of 2.8 million pounds of recyclables through their curbside services. In addition, 462,000 lbs. of material were recycled through the Meridian Recycling Center. This does not include an additional 3250 cubic yards of leaves and yard clippings that was composted or turned in to mulch.

Transportation

In 2018, a major focus has been upon maintain Meridian's 80+ miles of pedestrian and bicycle pathways. This includes repair of bridges and installation of culverts. Planning is underway to connect several key pathways along Marsh Rd., Okemos Rd., and Towner Rd. A "road diet" (4- to 3-lane, plus 2 bike lanes) is being planned for Lake Lansing Rd. as well.

Capital Area Transportation Authority and Meridian will explore efficiency improvements and a millage renewal for Redi-Ride services in 2019. Bike parking requirements and a complete streets ordinance remain in effect to guide development and infrastructure improvements.

In regards to vehicles, Meridian purchased two electric mowers in 2018 which help emission reductions. Another electric mower purchase is planned for 2019.

Meridian is working with Capital Area Transportation Authority and Tri-County Regional Planning Commission to determine the percent sustainable commutes by mode type (%walked, %biked, % public transportation, etc.).

Water Management

Meridian was involved with several initiatives to enhance green infrastructure in the township. Perhaps most significantly, land preserves exceeded parks in total acreage. Over 900 acres of land preserves have been made possible by a Land Preservation Millage.

In addition, the Township has engaged in several educational and demonstration projects including:

- Buffer strips near the edge of the Lake Lansing.
- Plantings in the Hidden River Rain Garden
- Invasive species mitigation in area parks and land preserves
- Tree planting
- Utility bill inserts (lawn care for water conservation and pollution reduction; fats, oil, and grease reduction; flushable wipes reduction)

Meridian is also a partner in the East Lansing Meridian Water and Sewer Authority. Significant renovation will greatly boost efficiency and provide waste reduction and renewable energy production (methane generator).

Total water usage for 2018 in Municipal Buildings was 1,006,000 gallons (see attachment). Township-wide water consumption in 2018 was 1,043,828,000 gallons.

Attachment A: Solarize Meridian 2018 Pilot Project Final Report

Solarize Meridian 2018 Pilot Project

Background

The Meridian Township Board approved a Climate Sustainability Plan in October 2017. The Plan includes a commitment to obtain 100% of the township government's electricity from renewable energy by 2035 and 25% of the total community electricity from renewable energy by 2025. In pursuit of the community goal, the Meridian Energy Team developed a workshop program to encourage and make it easier for homeowners, businesses, and churches to install solar electric systems on their buildings.

The Meridian Energy Team worked with the Lansing Area Solar Users Network (LaSUN), an informal network of local solar owners, and local civic organizations and houses of worship. LaSUN surveyed 26 solar installers and identified 13 who were interested in participating in the project and committed to providing rooftop solar systems for a competitive price which was determined to be $3/watt. LaSUN provided the list of solar installers that were distributed at each of the workshops.

The Meridian Energy Team developed an education and outreach effort to provide homeowners and businesses with the information they needed to decide whether to purchase a solar electric system. A one-hour workshop was developed that included a 15-minute solar overview, a 15-minute solar story, and 30 minutes for Q&A. It was decided that local solar owners would be neutral and credible workshop presenters and that local organizations should host and promote the workshops.

The project was an all-volunteer effort. The Meridian Energy Team would like to thank Jim Detjen, Heidi Porter, Ken Rosenman, Terry Link, and David Arnosti for telling their solar stories at the workshops. The Team would also like to thank Roger Eberhardt, LeRoy Harvey, and John Sarver for presenting solar overviews. The project was only possible because workshop hosts provided promotion and sites for the workshops. Workshop hosts included Meridian Senior Center, Okemos Public Library, League of Women Voters Lansing Area, Haslett Community Church, University Lutheran Church, Islamic Center of East Lansing, Unitarian Universalist Church of Greater Lansing, Okemos Haslett Rotary, Woodhill Condominium Assn., Liaison for Inter-Neighborhood Cooperation, Harris Nature Center, Edgewood United Church, and Bharatiya Temple. There were 11 workshops held in Meridian Township, East Lansing, and Lansing that reached 272 persons. In addition, there was a workshop in Delta Township that reached 18 persons.

Results

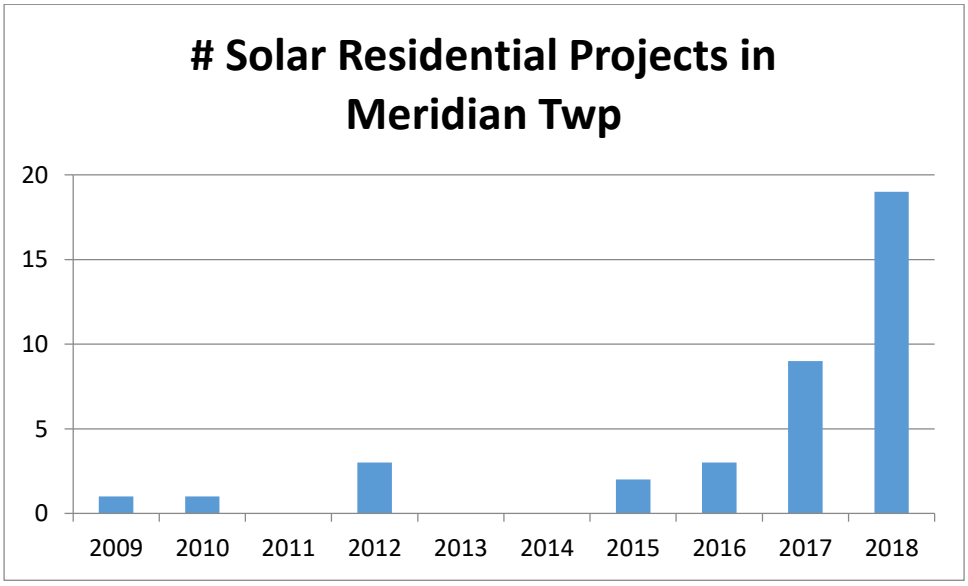
The Meridian Energy Team was pleased with the attendance at the 12 workshops, but wanted to determine how many solar electric systems were installed as a result of the project. The township

assessment department provided basic information on solar systems and solar installers were surveyed. The township assessment department helped the Meridian Energy Team identify 19 residential solar electric systems installed in the township before 2018.

There was a significant increase in residential solar electric systems in Meridian Township in 2018. The number of systems doubled. While not all the new installations should probably be attributed to the Solarize Meridian project, it is reasonable to assume that the project was a major influence in increasing the number of solar installations in the township. Residents in other parts of the Lansing area attended the workshops and a survey of participating solar installers identified another 4 residential solar installations that could be attributed to the Solarize Meridian project.

	# Projects	Total kW's	Total Annual kWh's	$/Watt
Meridian Township	19	88.6	107,560	2.9
Lansing Area	4	36.1	43,825	3.0
Total	23	124.7	151,385	3.0

The Meridian Energy Team believes the project has been successful because 1) a local organization, the Meridian Energy Team, sponsored the project, 2) solar installers interested in participating were identified and required to provide a solar system at a competitive price, 3) workshop presenters were local solar owners, 4) workshops were hosted and promoted by local public and non-profit organizations, and 5) federal tax credits and net metering credits will be decreasing and the timing is good to go solar.



The Meridian Energy Team believes the project was a success because there was a significant increase in the number of solar installations in the Township during 2018. Efforts will continue to help township residents, businesses, and institutions interested in installing solar electric systems.

Attachment B: Solar Array Press Release

MERIDIAN TOWNSHIP NEWS AND INFORMATION

Meridian Township Constructs New Solar Array

Post Date:10/17/2018

In October of 2018 the new Township Solar Panel Array was constructed. The Meridian Township Board agreed to invest in a renewable energy system, reflecting a commitment to a Climate Action Plan they adopted in 2017.

Over its lifetime, this 20KW solar array will well help reduce Meridian Township's carbon footprint by 548 tons. This is equivalent to:

- Planting 12,768 Trees
- Driving reduced by 1,096,000 auto miles, or 55,896 gallons of gasoline
- Recycling 1,732 tons of waste instead of sending it to a landfill
- Displacing CO2 emissions from the annual electric use of 62 homes
- 533,983 pounds (267.0 tons) of coal burned
- Avoiding the use of up to 13,358,000 gallons of water by Thermoelectric Power plants.

The system consists of 56 photovoltaic panels. The array will produce approximately 20 kilowatts (KW) of energy in full sunlight or 20 kilowatt-hours (KWH) in an hour of full sun). In an average Michigan year, it will produce 26,716 KWHs of electricity. CBS Solar, the contractor, estimates that it will supply approximately 8% of the energy used in the Municipal Building. This percentage will increase as we improve the efficiency such as lighting, computers, heating, air conditioning, etc. The total cost of the system was $50,323. According to CBS Solar, the utility savings over 25 years will be $143,227. The panels began producing electricity on October 12, 2018. See photos of the installation here.

What's next?

- Meridian is exploring some finishing touches on the landscape. Proposals have been sought for some landscaping, potentially to include a rain garden.
- The Project Team is also exploring ideas for a sign and other educational tools.
- The Meridian Energy Team is researching next steps for achieving Meridian's 100% renewable energy goal.

Attachment C: Energy Team Summary of Goals and Accomplishments

Goals for 2019	Continue/Refine/Deliver Solar Meridian (education to residents and businesses). Initiatives to include: • Neighborhood solar open houses • Educational Presentations in collaboration with Lansing Area Solar Users Network • Factsheets • Networking with local schools • Collaboration with HOM-TV and others
	Help Township move toward 100% renewable goal (provide 100% of electricity for Twp. operations from solar)
	Help Draft Year 1 Climate Sustainability Report
Accomplished 2018	Began implementation of Meridian's Climate Sustainability Plan
	Solar Meridian: 272 residents reached; # of residential systems doubled in Twp.
	Solar Panel Project: 20 KW system installed
	Solar Contractor List
	Sustainable Home and Business Tour

Attachment D: Data

Water Consumption: Township Operations

	Address	Gallons	Payment
Service Center	2100 Gaylord Smith Ct	210,000.00	$2,057.10
Old Library	5670 School St	0	$20.00
Public Safety	5147 Marsh Rd	330,000.00	$3,198.30
Municipal Building	5151 Marsh Rd	253,000.00	$1,905.03
Chapel / Historic Village Irrigation	5103 Marsh Rd	79,000.00	$1,180.22
South Fire Station	3711 Okemos	10,000.00	$155.10
Main Fire Station	5000 Okemos	84,000.00	$858.84
North Fire Station	2140 Haslett Rd	40,000.00	$440.40
	Total	1,006,000.00	$9,814.99

Township-Wide Water Consumption

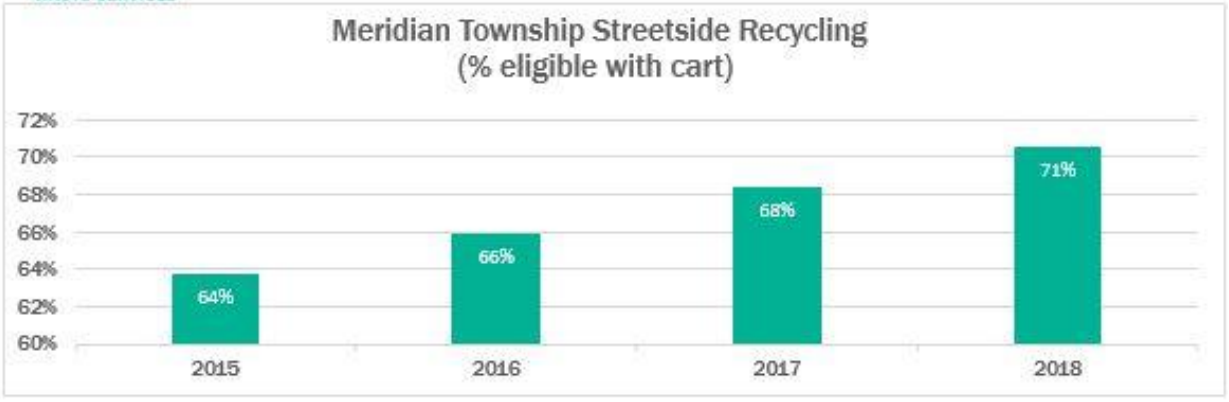
2018	WATER GALLONS
Zone 1	158,700,000
Zone 2	188,921,000
Zone 3	237,971,000
Zone 4	23,954,000
Zone 6	427,259,000
Finals	6,892,000
SPECIAL	131,000
TOTALS	**1,043,828,000**

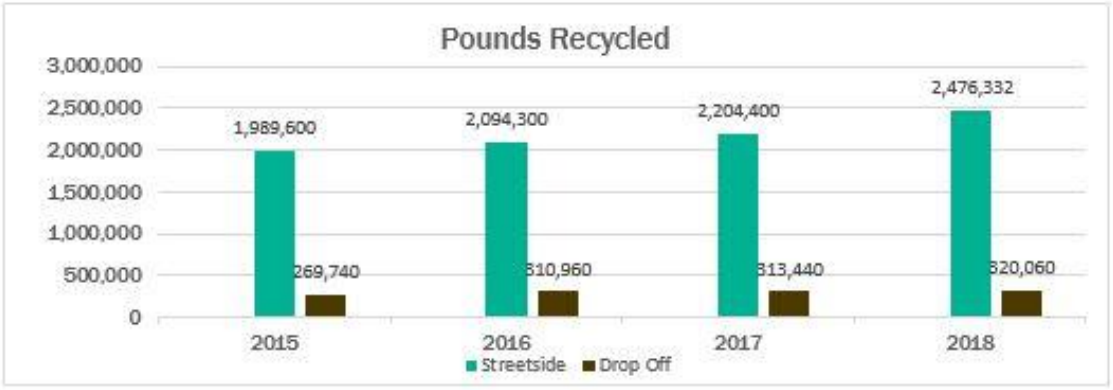
Curbside Recycling (Granger)

GRANGER WASTE SERVICES

MERIDIAN TOWNSHIP
RECYCLING & WASTE REPORT 2018

MERIDIAN TOWNSHIP · EST. 1842 · A Prime Community





RECYCLING PROGRAM ELEMENTS

- Every other week collection schedule.
- No additional charge for service with a recycling tub.
- Customers may choose the larger Curby Recycler for $1.50 per month. (currently)
- Single-family households of four or fewer units not participating in a contract are eligible.
- Subscription to Granger trash service

Total Recycling Volume (Pounds):

2,796,392

Your recycling efforts have resulted in any one of the following.	
Number of Trees Saved (17 trees per ton recycled)	23,769
kWh of Electricity Saved (4,100 kWh per ton recycled)	5,732,604
Pounds of Air Pollution Effluent Reduced (60 lbs. per ton)	83,892
Gallons of Water Conserved (7,000 gallons per ton) recycled)	9,787,372
Cubic Yards of Landfill Space Saved (3.33 yards per ton)	4,656

Meridian Recycling Center

Reclaimed by Design (RBD), the firm that manages the Meridian Recycling Center and Transfer Station, reports the following quantities of material recycled.

Paper	97 tons
Plastic	27 tons
Cardboard	75 tons
Polystyrene Foam	10 tons
Metal	22 tons
Yard Debris	3250 cubic yards

In addition to recycling and trash services, the Center passed all County inspections and remains incident free for 7 years. This year, total recycling by RBD has exceeded 2 Million pounds! (2,407,500 lbs.). There have also been improvements to the road/driveway.

Recycling Events

	Fall '18	**Spring 18**
Visitors:	610	1000+
Electronics –	26686	56561 lb. (3 semi-trucks)
Metal	15980 ~35 Freon items	20,100 lbs. 65 Freon items
Documents	7200 lbs. (13 gaylords)	Not collected
Paint	1972 containers 12,815 lbs.	4,250 containers 25,500 lbs.
Peanuts –	10 big bags	Several large bags
Egg Cartons –	5 large bags -	Many hundreds
Household items, inc. books, furniture, clothing, etc.		2 full large trucks
Bikes –	75	90
Medicines	2 barrels 23 lbs. controlled	Not collected
Volunteers:	90+	100+
Donations:	$1671	$2067
Charges:	$3441	$6032

Attachment E: Summary of Objectives & Strategies

a. Energy Efficiency
Objective a.1: Achieve significant energy cost savings and carbon emission reductions in Township facilities.
1. Implement recommendations from the Consumers Energy Building Performance with Energy Star Study including development and adoption of a Meridian Energy Policy.
2. Implement Phase II Energy Recommendations and HVAC Engineering Study and include major HVAC upgrades in Capital Improvement Plans.
3. Obtain Energy Star designation for township buildings where possible.
4. Use LEED Gold criteria or the equivalent for all projects undertaken by the Township. LEED criteria include measures related to energy efficiency, renewable energy, recycling and waste management, transportation, and water management.
5. Monitor energy savings and return 80% of savings to Revolving Energy Fund.
6. Budget funds for energy efficiency assessments a minimum of once every five years.
7. Address sustainability implications in proposals for capital improvements. Township Manager will consider criteria related to energy efficiency, renewable energy, waste management, transportation, and water management when developing a capital improvement plan.
Objective a.2: Explore other opportunities and partnerships to achieve energy savings.
8. Identify and pursue State and Federal grant funding, pilot programs, and utility programs.
9. Further build partnerships such as Michigan Green Community Network, Clean Cities, Sustainability Forums, and expand collaboration with other local governments in our region.
10. Establish incentives to builders to exceed the energy efficiency provisions of the state building code.
11. Increase tree canopy throughout the township and especially in business areas to reduce cooling loads. Consider the potential for future solar energy installations when deciding placement of trees. Propose ordinance changes and provide incentives for existing businesses to upgrade their parking lots and landscaping to increase tree cover and shade to be energy efficient and environmentally friendly.
12. Create incentives for the use of white roofs or green roofs to reduce cooling loads.
13. Identify opportunities and remove barriers to support the construction of "tiny houses."
14. Review parking requirements and provide incentives to reduce and remove asphalt.
Objective a.3: Provide educational opportunities for Township staff and residents about energy consumption, energy savings opportunities, and utility incentives.
15. Improve delivery of information and data on energy consumption to building managers, Township staff, accounting/budgeting staff, and financial managers.
16. Provide Information to Township residents so they are aware of Township efforts and utility and other programs that can assist them.
b. Renewable Energy
Objective b.1: Develop Township policies and procedures that encourage the use of renewable energy.
17. Revise Township ordinances and procedures to ensure that they encourage energy conservation and the use of renewable energy.
18. Develop renewable energy and other practices that reduce greenhouse gas emissions that can be included in the list of amenities allowed in mixed use and commercial planned unit developments (PUDs).
Objective b.2: Increase the use of renewable energy at Township facilities.
19. Obtain 50% of Township electricity from renewable energy by 2025 and 100% by 2035. The Township receives almost all of its electricity from Consumers Energy and indirectly will get 15% of its electricity from renewables due to the state Renewable Portfolio Standard (RPS) requiring the 15%.
20. Pursue the installation of solar electric systems at Township facilities by Dec. 31 2018. Identify and evaluate options to fund solar energy installations on Township facilities.
21. Participate in Community Solar or other green purchasing programs where possible.
22. Identify and seek grant funding for demonstrations of new renewable energy technologies.
23. Identify opportunities for non-grid connected applications like solar street lighting and solar lighting for signs.
24. Explore solar and other efficient back-up power options for Township facilities.
Objective b.3: Provide educational opportunities regarding renewable energy options and encourage the installation of renewable energy at private and public facilities throughout the Township.
25. Obtain 25% of total community electric use from renewable energy resources by 2025. This includes the 15% due to Michigan's Renewable Portfolio Standard (RPS) requirements.
26. Provide educational opportunities on current and proposed policies, programs and incentives that could help Township residents, businesses, and institutions utilize renewable energy.
27. Share information about funding and vendors with residents and business owners.
28. Provide incentives to developers to employ renewable energy in site plan and construction of new development. Identify and adopt incentives to encourage greater use of renewable energy, e.g. incentives for net zero homes or PV systems, elimination of permit fees for PV systems.
29. Collaborate with schools and other institutions on joint purchasing of renewable energy systems.
30. Inventory, highlight, and promote Meridian homes and businesses that feature net-zero, renewable, LEED, and related features.
c. Recycling and Waste Reduction
Objective c.1: Increase recycling in owner-occupied dwelling units. Reduce the amount of materials sent to landfills by 10% in 5 years.
31. Work with Granger and others to expand the use of 96 gallon carts and remove disincentives for recycling.
32. Evaluate having a single hauler in the township.
33. Launch a collaborative marketing and outreach program in the Township to promote existing recycling services and options.
34. Conduct regional education and promotion opportunities in collaboration with the Regional Recycling Coordinating Committee (R2C2), Capital Area Local First (CALF) and other neighborhoods, organizations, and partners.
Objective c.2: Expand recycling in multi-family housing, township departments, and in other commercial settings. Reduce the amount of materials sent to landfills by 10% in 5 years.
35. Promote and expand current recycling efforts in multi-family housing.
36. Revise ordinances and policies as necessary to encourage recycling.
37. Provide technical assistance to managers and occupants of multi-family housing/apartments.
38. Implement a recycling campaign for all township departments.
Objective c.3: Offer community- and region-wide recycling events and other partnerships
39. Partner with local business, schools, neighborhoods, governments, churches, and others to promote and offer recycling events.
40. Promote Ingham County household hazardous waste collections.
41. Explore collaborative processing and/or transfer of recyclables locally and/or in the region.
42. Identify and implement food, cooking oil/grease, composting, and related organic material recycling options.
43. Provide educational opportunities concerning the 5 R's: Refuse, Reduce, Reuse, Repurpose, & Recycle.

44. Consider a ban on plastic bags for single use purposes. Promote re-usable bags, bottles, etc.

d. Transportation

Objective d.1: Encourage employee and citizen participation in Smart Commute competitions and encourage Township employees and citizens to be smart commuters year round.

45. Continue to expand the bike and pedestrian pathways network throughout the Township.
46. Incentivize employee participation in Clean Commute competitions and encourage employees to be smart commuters year round.
47. Partner with Capital Area Transportation Authority and others to promote "Clean Commute" options and identify efficient paratransit and Redi-Ride efficiency improvements.

Objective d.2: Decrease the use of petroleum in the Township vehicle fleet.

48. Choose the cleanest and most fuel-efficient vehicle that meets the department's needs.
49. Use electric or hybrid vehicles whenever possible.
50. Use efficient trip-planning to reduce the use of fuel.
51. Conduct an efficiency inventory and audit of the Township vehicle fleet.
52. Adopt a fuel efficiency target for the Township vehicle fleet, including an implementation plan for reaching this target. The plan should incorporate vehicle efficiency and life cycle cost analysis as well as highlight opportunities for purchasing or converting vehicles to be more efficient.
53. Review and update the idling policy for the government fleet and/or a community-wide policy.
54. Identify and seek funding for alternative fuel vehicles and electric charging infrastructure.

Objective d.3: Use land-use planning to reduce vehicle miles traveled and petroleum use.

55. Accelerate implementation of the Township's Complete Streets policy to ensure that entire roadways are designed and operated with all users in mind - including bicyclists, public transportation vehicles and riders, and pedestrians of all ages and abilities.
56. Use the Urban Services Boundary to reduce vehicle miles traveled and encourage infill and redevelopment.
57. Encourage cluster developments, mixed use and other compact residential choices closer to shopping, public transit and other services.
58. Offer fast tracking and technical assistance for sustainable developments.

Objective d.4: Provide educational opportunities on transportation alternatives that can reduce petroleum use.

59. Provide educational opportunities concerning public transit, car sharing, smart commuting, and transportation-efficient communities.
60. Provide educational opportunities on biking, walking, and driving safely, especially around bikers and walkers.
61. Continue membership in and partnerships with Greater Lansing Area Clean Cities (http://michigancleancities.org) and providers of efficient vehicles, equipment, and fuels.
62. Provide web sites and apps that identify charging stations for electric vehicles. Identify funding and opportunities for electric car charging stations.
63. Promote the employee and volunteer bike-sharing program.

e. Water Management

Objective e.1: Decrease water usage at Township facilities.

64. Use building audits to determine which water fixtures to upgrade.
65. Amend purchasing policy to require that when purchasing or replacing new toilets only low flow fixtures will be purchased.
66. Install waterless urinals where appropriate.
67. Implement, as funds allow, a system to capture and use rainwater and gray water for turf and landscape irrigation at municipal facilities.

Objective e.2: Reduce storm water runoff.

68. Partner with the Ingham County Drain Commissioner on reduction in storm water runoff.
69. Review and change policies as needed to accommodate expected changes in storm surges and extreme weather events.
70. Increase the number of street trees.
71. Use porous pavement, rain gardens, bioswales, riparian buffers, and retention ponds as appropriate. Use township parks and other properties to demonstrate these strategies.
72. Provide credits on water bills for rain barrels, porous pavement, and rain gardens.
73. Encourage projects that reuse storm water for irrigation purposes.
74. Discourage development within wetlands, floodplains, floodplain fringe areas, and water retention areas. Strengthen the Township wetlands ordinance in order to increase wetland acreage in the Township.

Objective e.3: Provide educational opportunities concerning water conservation and management.

75. Use signs, brochures, and other outreach materials to describe why we conserve water and what the Township is doing to conserve water, alternatives to fertilizer use and how it affects stream ecosystems, drought resistant grasses, native plants, rain barrels, water efficient appliances such as low-flow toilets, and how one's water usage compares to a typical home's water usage.
76. Use media, web page, HOM-TV, public forums, and other means to encourage water conservation.

Objective e.4: Explore opportunities for water efficiency improvements within Meridian's water supply and sewage treatment systems.

77. Work with East Lansing Sewage Treatment Plant and Lansing Board of Water and Light to identify ways to reduce water use and sewage.
78. As a member of the East Lansing Meridian Water & Sewer Authority, identify ways to reduce water use.
79. Review water safety and supply plans and strategies.

f. Monitoring and Evaluation

Objective f. 1: Monitor greenhouse gas reductions and energy and cost savings and determine benefits to the community.

80. Conduct a greenhouse gas inventory of the Township government operations.
81. An annual progress report will be prepared by township management on activities related to the Climate Sustainability Plan.
82. Evaluate cost-effective energy monitoring systems, software, assistance, and equipment including WeGoWise and Consumers Municipal Energy Efficiency Pilot and invest in monitoring equipment as needed
83. Prioritize top energy-using sites, buildings, and equipment for more frequent monitoring.
84. Explore opportunities with Consumers' E-Billing Program, smart metering, street lighting, and other pilot programs.
85. Calculate annual water, energy, and cost savings and reductions in greenhouse gases. Reporting metrics would make annual comparisons and include:
    - Annual greenhouse gas reductions for municipal operations and the community (tons)
    - Annual municipal and community energy consumption (MBTU)
    - Annual energy and cost savings from energy improvements to municipal buildings (MBTU, $)
    - Annual renewable energy generated from township facilities or purchases (kWh)
    - Annual renewable energy generation in the community (kWh)
86. Materials recycled communitywide (tons)
87. Number of participants recycling (#residents, #businesses)
88. Annual municipal water consumption (gallons)
89. Annual community water consumption (gallons)
90. Number of electric, electric hybrid, or alternative fuel vehicles in the township fleet
91. Annual fuel savings in the township fleet (gallons of petroleum-based fuel)
92. Percent sustainable commutes by mode type (%walked, %biked, % public transportation)
93. Objectives and strategies in this plan should be revisited every 5 years and a summary of accomplishments prepared.