



# **Detroit Metropolitan Wayne County Airport ZERO EMISSIONS ROADMAP**

**FINAL**

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Detroit  
Metropolitan  
Airport  
William Rogell Drive,  
Detroit, MI, 48242



DETROIT METRO • WILLOW RUN  
WAYNE COUNTY AIRPORT AUTHORITY

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## Executive Summary

Climate change poses major risks to the airport industry. Airports around the world, especially coastal ones, face tremendous pressures from rising sea levels, storm surges, extreme temperatures, and more intense storm events. As the operator of a large hub airport in North America, Wayne County Airport Authority (WCAA) takes the challenges posed by climate change seriously. Taking actions to address climate impacts reduces the risks posed to the physical condition of airport infrastructure, the Authority's financial resources, and reputation with the public.

WCAA, recognizing its role as “the Face of Southeast Michigan,” strives to be a leader in environmental awareness among airports and the greater community. In 2015, the Airport Authority introduced its People, Planes, & Planet Sustainability Program, which focuses on sustainability initiatives at Detroit Metropolitan Airport (DTW) such as waste reduction efforts and greenhouse gas (GHG) emissions reduction. This program validates the environmental priorities of passengers traveling through DTW and the airlines that carry them.

WCAA sees significant value in participating in the global effort to combat climate change by investing in strategies to reduce emissions. Avoided costs of new infrastructure are usually far less than replacement costs for infrastructure designed to withstand the extreme temperatures and storms anticipated to increase in severity due to climate change. There are financial benefits to investing in emissions reducing technology as well as reputational and workforce benefits. Airports around the globe have begun to pursue emissions reduction plans, and WCAA strives to maintain its leadership in the airport industry, for its passengers, business partners, and employees.

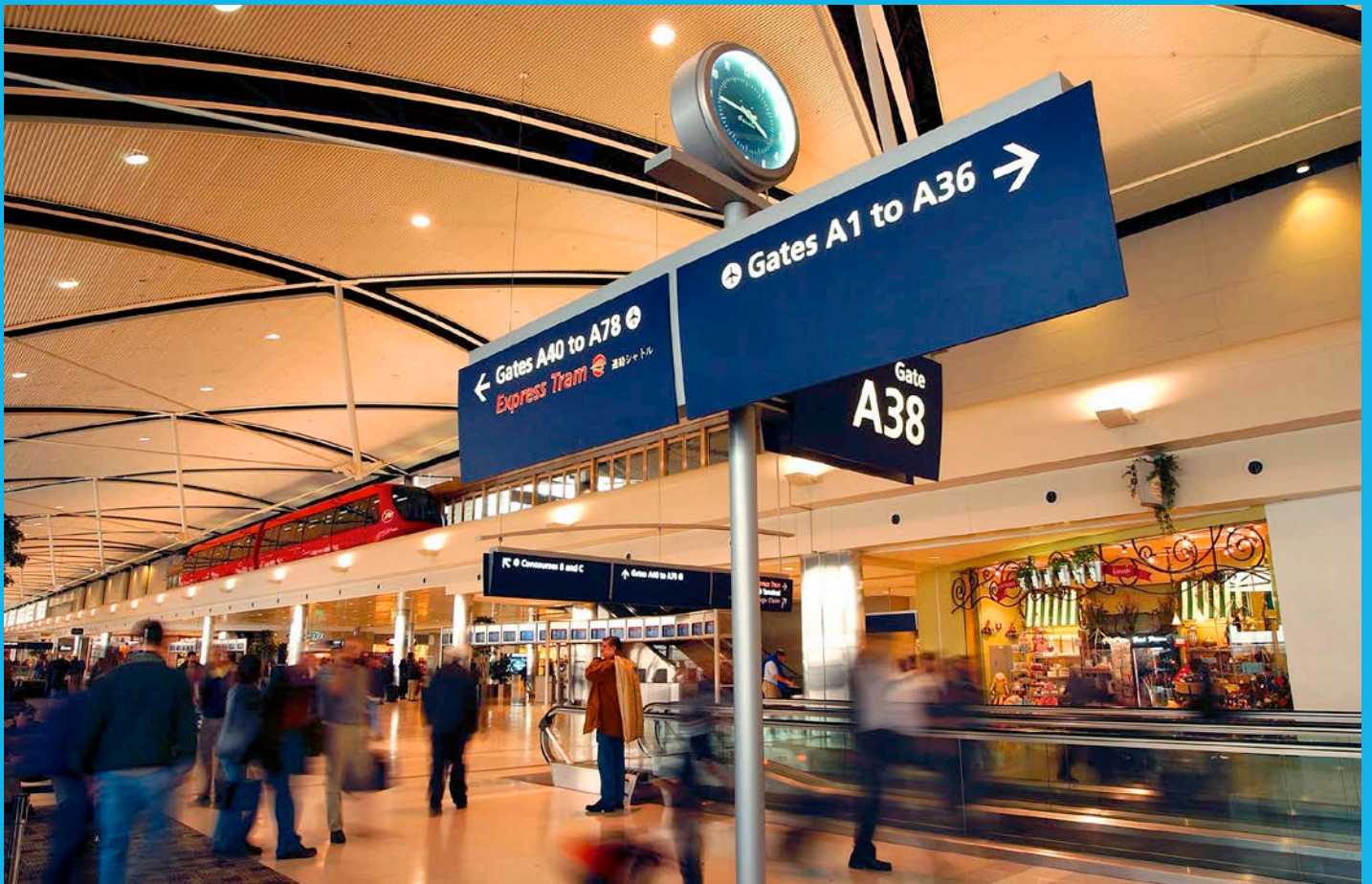
In this spirit, WCAA developed this roadmap in 2020 to plot a course towards significant reductions in GHGs. This roadmap contains the following elements:

- Regulatory context
- Business case for reducing emissions
- Stakeholders
- Current emissions inventory
- Goals and objectives
- Implementation actions
- Funding sources
- Metrics and monitoring



### A Call to Action

This roadmap is motivated by an imperative to protect the health and safety of all Michiganders while fostering a sense of collaboration among all airport stakeholders and serving as good stewards of public funding. The roadmap represents a significant step forward for climate action and pollution reduction at DTW. We look forward to continuing engagement with a diverse airport community in implementing and refining this roadmap in coming years.



## Introduction

The Wayne County Airport Authority (WCAA), recognizing its role as “the Face of Southeast Michigan,” strives to be a leader in environmental awareness among airports and the greater community. In 2015, the Airport Authority introduced its People, Planes, and Planet Sustainability Program, which focused on sustainability initiatives at Detroit Metropolitan Airport (DTW) such as waste reduction efforts and GHG emissions reduction. This program validates the environmental priorities of passengers traveling through DTW and the airlines that carry them and supports the pledges made by several airlines to address waste issues and mitigate GHG emissions from their business operations. In recognition of DTW’s progress, Airports Council International (ACI) has awarded DTW three successive levels of certification in its Airport Carbon Accreditation program.

Airport Carbon Accreditation recognizes and accredits the efforts of airports to manage and reduce their carbon emissions. There are four levels of certification: Mapping, Reduction, Optimization, and Neutrality. Level 1 (Mapping) requires carbon footprint measurement. Level 2 (Reduction) requires carbon management and progress towards a reduced carbon footprint. Level 3 (Optimization) requires third-party engagement in carbon footprint reduction. Third parties include airlines and various service providers, including independent ground handlers, catering companies, air traffic control and others working on the airport site. Level 3 also involves engagement on surface access modes (road, rail) with authorities and users. Level 3+ (Neutrality) requires fulfilling the requirements of the first three levels and then neutralizing any remaining direct carbon emissions by offsetting.

WCAA has been tracking carbon emissions from its operations since 2013 as part of Airport Carbon Accreditation. WCAA started tracking Scope 1<sup>1</sup> and Scope 2<sup>2</sup> emissions in 2013 and achieved Level 1 in 2016 and Level 2 in 2017, after showing consecutive years of reductions. WCAA expanded its emission inventory to track Scope 3<sup>3</sup> emissions in 2018 and achieved Level 3 in Airport Carbon Accreditation in 2019. As a requirement of the program, WCAA set its first carbon emissions reductions goal in 2016: To show a 10% reduction in CO<sub>2</sub> emissions in 2020 over its 2013 baseline. WCAA developed a carbon reduction strategy focusing on energy efficiency and utilizing leading design standards for new buildings and infrastructure projects to help achieve this goal.

WCAA exceeded its 2020 carbon emission reduction goal in 2018. WCAA participated in a planning workshop for testing the guidebook developed for Airport Cooperative Research Program (ACRP) 02-82,

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<sup>1</sup> Scope 1: Direct greenhouse gas emissions. These emissions are generated by sources that are owned or controlled by WCAA.

<sup>2</sup> Scope 2: Indirect greenhouse gas emissions. These emissions are generated by the electricity purchased by WCAA.

<sup>3</sup> Scope 3: Other indirect greenhouse gas emissions. These emissions are generated by all the activities occurring at the airport due to tenants and other sources not owned or controlled by WCAA.



Developing a Roadmap to Achieve Zero Emissions at Airports. Seeing that steep emissions cuts were possible and warranted, the WCAA board passed a new goal and policy in June 2020<sup>4</sup> to achieve 50% Reductions in 2030 and aspire to net zero<sup>5</sup> status by 2050. WCAA enlisted technical assistance from the ACRP project team to develop a roadmap to achieve these goals at WCAA. This roadmap is a culmination of those efforts, laying out several strategies that WCAA can employ to achieve its pathway to zero emissions.



<sup>4</sup> Resolution No. 20-48 Wayne County Airport Authority Sustainability Policy Control #2050112. [http://www.metroairport.com/sites/default/files/business\\_documents/environmental/Sustainability/wcaa\\_sustainability\\_policy\\_res\\_20-48.pdf](http://www.metroairport.com/sites/default/files/business_documents/environmental/Sustainability/wcaa_sustainability_policy_res_20-48.pdf)

<sup>5</sup> Net zero: Any remaining scope 1 or scope 2 carbon emissions will be offset through market programs or investment in carbon capture technology.

## Regulations, Laws, and Context for Roadmap

WCAA's emissions reduction pathway has been heavily influenced by actions taken throughout the global airport industry and beyond. In 2018, the Intergovernmental Panel on Climate Change (IPCC) published its Special Report on Global Warming of 1.5°C, which describes the need for immediate and aggressive action on climate change.<sup>6</sup> The report finds that limiting climate change to 1.5°C requires global net anthropogenic emissions to be zero by 2050. Both ACI World and ACI Europe passed resolutions aligning with this target: the European airport community has formally pledged to become net zero for carbon emissions under its control by 2050, while the ACI World Governing Board has agreed to a far-reaching worldwide study on a long-term carbon goal for airport operators, including considerations of a net zero carbon goal by 2050, and outlined possible pathways to achieve these goals. At the national level, emissions from Detroit Metropolitan Airport are mostly governed by the Environmental Protection Agency (EPA) National Ambient Air Quality Standards. Currently, the airport is in a non-attainment zone for ozone. This has led to action at the state level, such as WCAA's participation in Michigan's Department of Environment, Great Lakes and Energy's (EGLE) Intermodal Transportation Emissions Workgroup to help facilitate discussion around potential air pollution control strategies for the state implementation plan.

Most recently at the state level, Governor Gretchen Whitmer signed Executive Directive 2020-10<sup>7</sup> on September 23, 2020, setting a goal for Michigan to become carbon neutral by 2050, with an interim goal for the state to reduce GHG emissions 28% below 1999 levels by 2025. This plan directs the EGLE agency to develop a strategy by the end of 2021 to reduce emissions across the state's key economic sectors. The directive also calls for all new state-owned buildings to be carbon neutral by 2040 and existing buildings to reduce energy use by 40% by 2040. In addition, DTE (WCAA's utility provider) has aimed to produce zero emission electricity by 2050. This is significant, as most of DTE's baseload is provided by coal plants with high emissions.

WCAA's goals were designed to align with the goals promoted throughout the airport industry and the state of Michigan. The implementation actions that WCAA proposes in this roadmap will help achieve a zero emission goal.

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<sup>6</sup> IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte et al.]. In Press. <https://www.ipcc.ch/sr15/chapter/spm/>

<sup>7</sup> State of Michigan Executive Directive No. 2020-10. [https://content.govdelivery.com/attachments/MIEOG/2020/09/23/file\\_attachments/1553296/ED%202020-10%20Carbon\\_Neutral\\_Goal.pdf](https://content.govdelivery.com/attachments/MIEOG/2020/09/23/file_attachments/1553296/ED%202020-10%20Carbon_Neutral_Goal.pdf)

## Business Case for Roadmap

Climate change poses a huge risk to the airport industry. Airports around the world, but especially in coastal areas, face tremendous pressures from rising sea levels, storm surges, extreme temperatures, and more intense storm events. Although climate projections show less of an impact on Michigan compared with much of the United States, Michigan is not immune, and its carbon emissions affect regions outside its borders. Regional climate projections predict an increase in air temperature, an increase in precipitation, and more extreme weather events<sup>8</sup>. These climate changes may significantly impact the infrastructure and operations at DTW. Extreme heat events may increase the risk of damage to pavement, worsen air quality, and stress airport workers. Increased extreme weather events may impact the construction season and disrupt flight operations. Flooding may tax the existing stormwater infrastructure and operations. Changing wildlife and migration patterns may impact operations and maintenance of the airfield and may increase vector-borne illnesses<sup>9</sup>. While some of these climate changes are already occurring and are likely to increase, global emissions reduction efforts to alleviate the worst impacts are underway. As the operator of a large hub airport in North America, WCAA takes the challenges posed by climate change seriously. WCAA has taken and will continue to take local actions to participate in this global effort.

There are direct financial opportunities (and risks) associated with addressing (or delaying) climate mitigation. Some airports have found that providing transparent information regarding their current emissions and emissions reduction plans to credit agencies has improved their bond rating. Conversely, bonds may become more difficult to underwrite as lenders come under increasing scrutiny from their oversight boards on climate risk. The Task Force on Climate-Related Financial Disclosures (TCFD) is becoming the industry standard for banks that have to report on the indirect emissions associated with their loans and investments; WCAA may come under pressure to address fossil fuel consumption usage as part of the bond issuance process.

Investing in emissions reducing technologies to combat climate change has long-term financial benefits as well. WCAA supports actions to avoid the costs of the new infrastructure that would be needed to withstand increasingly extreme temperatures and storms through investments in emissions-reductions strategies that reduce the need to replace existing infrastructure. Many of these investments also produce lifecycle savings. For example, WCAA has invested in, and will continue to invest in, energy efficiency measures. While the upfront costs of such measures, including LED lighting and electric buses, may exceed the costs of standard fluorescent lighting and diesel buses, the reduced operations and

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<sup>8</sup> Climate Change in the Great Lakes Region.

<http://glisa.umich.edu/media/files/GLISA%20%20Pager%202019.pdf>

<sup>9</sup> Climate and Health Adaptation Planning Guide for Michigan Communities.

[https://www.michigan.gov/documents/mdhhs/ClimateHealthPlanningGuide\\_2020\\_10\\_2\\_accessible\\_704110\\_7.pdf](https://www.michigan.gov/documents/mdhhs/ClimateHealthPlanningGuide_2020_10_2_accessible_704110_7.pdf)

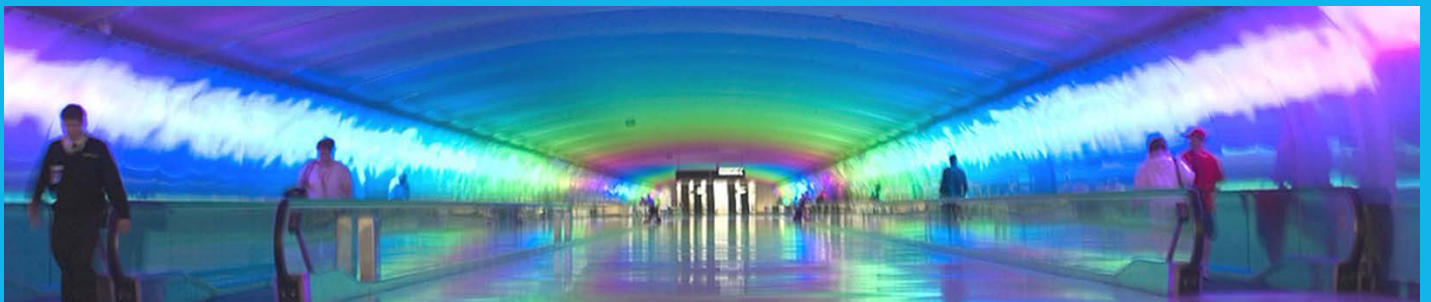
maintenance costs make these technologies more attractive over their lifetime. And entering into a long-term power purchase agreement enables WCAA to hedge against rising future energy prices.

Carbon pricing is gaining traction on a national level as a bipartisan policy to mitigate GHG emissions, and WCAA may choose to factor the cost of carbon into future energy related projects at the airport to understand potential liabilities. For illustrative purposes, the seven carbon pricing bills under consideration in the 116th Congress establish a price on carbon starting as low as \$20 a metric ton and rising to a high of \$150/ton by 2030. Applied to WCC this would have an annual impact of \$3 million in 2020 to a high of \$23 million at the end of this decade.

WCAA prides itself as the operator of one of the best airports in North America. ACI recognized DTW with its “Best Airport” Award in 2018 and JD Power & Associates awarded DTW its “Best Airport” Award in 2019, both based on customer satisfaction. WCAA also strives to be the best airport for its business partners and employees. Several of WCAA’s partners have announced commitments to carbon neutrality, including Delta and Jet Blue, two carriers at DTW. Other business partners have requested information on the environmental performance of DTW. WCAA would like to support these businesses with the infrastructure and resources necessary to achieve their goals.

Finally, reducing emissions at the airport will promote better air quality and provide a healthier environment for all workers at the airport. This may enhance WCAA’s ability to attract and maintain a talented workforce. Younger workers, such as Millennial and Gen-Z generations, care deeply about the environment. A 2019 study by Amnesty International’s “Future of humanity” survey revealed that Climate Change is the top fear among Gen-Z respondents. And a large percentage of Millennials want to work for an employer that supports the environment, according to a 2019 report by Gallup.

WCAA sees significant value in participating in the global effort to combat climate change by investing in strategies to reduce emissions. Airports around the globe have begun to undertake emissions reducing plans, and WCAA strives to maintain its leadership in the airport industry, for passengers, business partners, and its employees.



## Stakeholders

WCAA identified stakeholders that had an interest in emissions reduction strategies at the airport. These stakeholders, their emissions interest, and WCAA’s engagement strategy is presented in Table 1.

**Table 1. Stakeholders with an Interest in Emissions Reductions**

Stakeholder Group	Major Organizations	Engagement Strategy	Primary Emissions Interest(s)
<b>Airlines</b>	Carriers in 2020 include Aeromexico, Air Canada, Air France, Alaska, American, Delta, DHL, FedEx, Frontier, Lufthansa, JetBlue, Royal Jordanian, Southwest, Spirit, United, UPS	Monthly Airline Council meetings	Airfield operations efficiency and infrastructure, fuel, ground support equipment, facilities infrastructure
<b>Local community</b>	City of Romulus, Greater Detroit	Public meetings	Local air quality, traffic patterns, construction
<b>Rental car agencies</b>	Avis-Budget, Enterprise, Hertz, DTG	Meetings	Surface transportation
<b>Concessions</b>	HMS Host, Paradies, DTW North Partners, WDFG, JamJaMar Inc, (McDonald’s), National Airport Concessions, HBF, MCE-DTW, DNC	Concessions meetings	Facilities infrastructure
<b>Airline support</b>	G2, Swissport, ATS, Worldwide Flight Services, Air General	Monthly Airline Council meetings	Airfield operations efficiency and infrastructure, fuel, ground support equipment, facilities infrastructure
<b>Fixed base operator</b>	Signature	Meetings	Airfield operations efficiency and infrastructure, fuel, ground support equipment, facilities infrastructure
<b>Contractors, suppliers, and vendors</b>	Bradford Logistics Services and others	Meetings	Construction, facilities infrastructure, surface transportation
<b>Federal agencies</b>	FAA, TSA, CBP	Monthly Airline Council meetings	Facilities infrastructure, funding, regulations
<b>State agencies</b>	MDOT/EGLE	Meetings	Regulations, funding
<b>Airport operator</b>	WCAA employees, WCAA Board	Survey, informal feedback, committees	Facilities infrastructure
<b>Airport users</b>	Passengers, employees	Survey, feedback	Facilities infrastructure
<b>Transportation providers</b>	SMART, Michigan Flyer, Uber, Lyft	Meetings	Surface transportation



## Current Emissions Inventory

### 2013 Baseline Inventory

WCAA started tracking Scope 1 and Scope 2 emissions in 2013 to establish a baseline. These emissions are presented in Table 2.

**Table 2. 2013 Emissions (Scope 1 and Scope 2) in metric tons**

Source		Scope	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2e</sub>	CO <sub>2e</sub> %
Airport	Airside Vehicles (diesel, gasoline)	1	3,659	0.3863	0.2445	3,742	2.42%
Airport	Buildings (gas/oil/coal)	1	24,868	0.4433	0.0443	24,891	16.11%
Airport	Fire Training (propane)	1	33.2	0.0006	0.0023	33.9	0.02%
<b>Subtotal</b>	<b>Airport Scope 1</b>		<b>28,559</b>	<b>1</b>	<b>0</b>	<b>28,667</b>	<b>18.55%</b>
Airport	Electricity purchased	2	125,852			125,852	81.45%
<b>Subtotal</b>	<b>Airport Scope 2</b>		<b>125,852</b>	<b>0</b>	<b>0</b>	<b>125,852</b>	<b>81.45%</b>
<b>Total</b>	<b>Scope 1+2</b>					<b>154,519</b>	

Note: Carbon dioxide equivalent (CO<sub>2e</sub>) is a metric used to compare different GHGs based on their Global Warming Potential, by converting emissions of GHGs to their equivalent amount of CO<sub>2</sub>.

### 2018 Inventory

#### Scopes 1 and 2

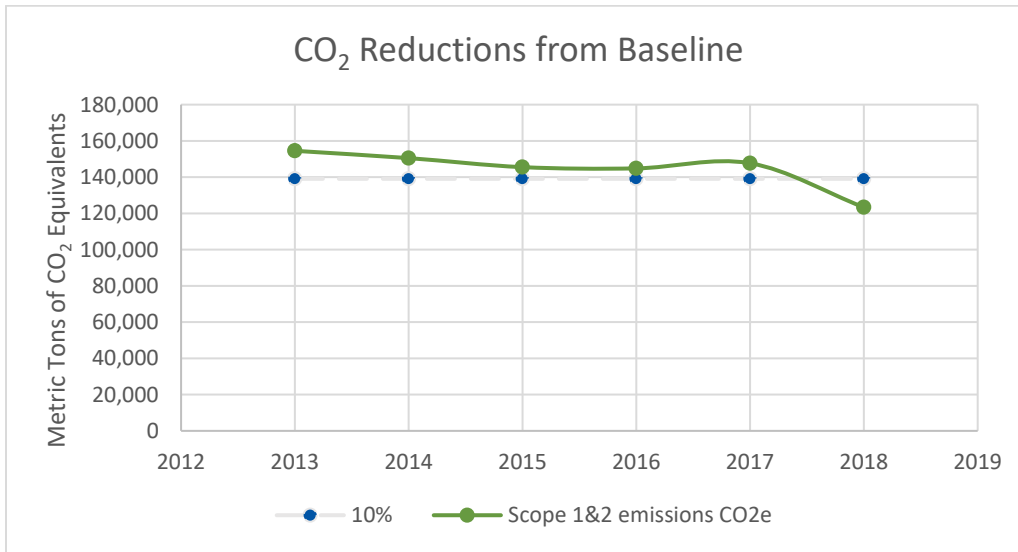
In 2018, WCAA updated the emissions inventory for Scopes 1 and 2. The updated inventory is shown in Table 3, and the subsequent figures show a comparison of the sources and emissions over the 2013 baseline.

**Table 3. 2018 Emissions (Scope 1 and Scope 2) in metric tons**

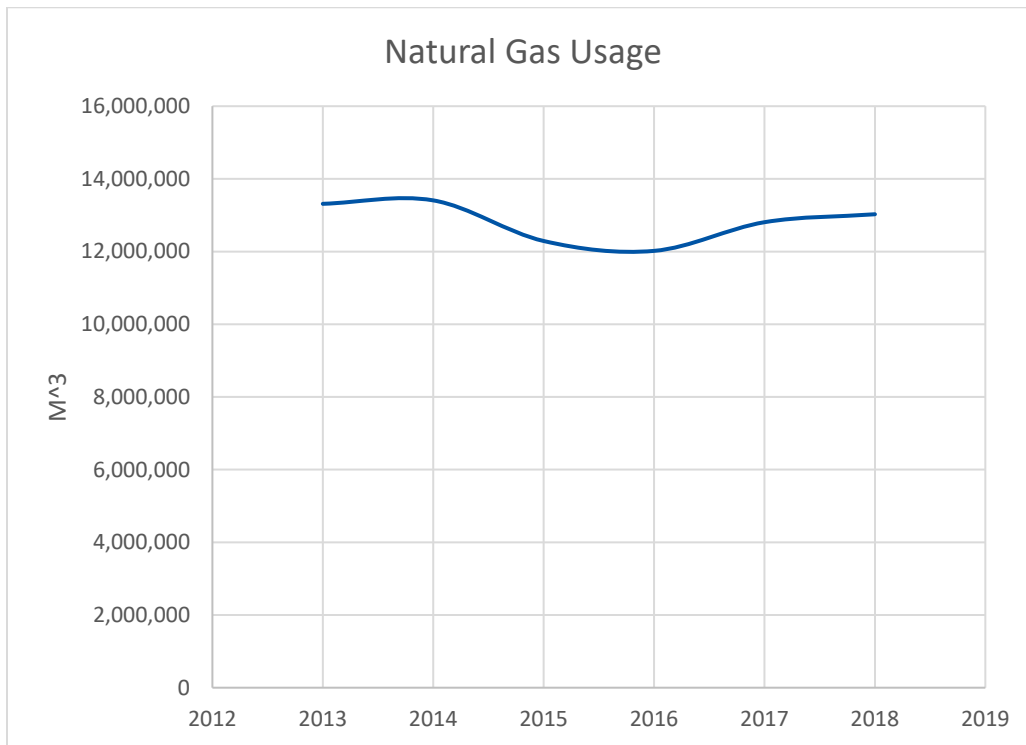
Source		Scope	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2e</sub>	CO <sub>2e</sub> %
Airport	Vehicles (diesel, gasoline)	1	6,178.1	0.666	0.415	6,320.8	5.13%
Airport	Buildings (gas/oil/coal)	1	24,554.4	2.188	0.044	24,613.9	19.98%
Airport	Fire Training (propane)	1	104.9	0.002	0.007	107.2	0.09%
<b>Subtotal</b>	<b>Airport Scope 1</b>		<b>30,837.4</b>	<b>2.856</b>	<b>0.466</b>	<b>31,041.9</b>	<b>25.20%</b>
Airport	Electricity purchased	2	92,163.2			92,163.2	74.80%
<b>Subtotal</b>	<b>Airport Scope 2</b>		<b>92,163.2</b>	<b>-</b>	<b>-</b>	<b>92,163.2</b>	<b>74.80%</b>
<b>Total</b>	<b>Scope 1+2</b>					<b>123,205.1</b>	



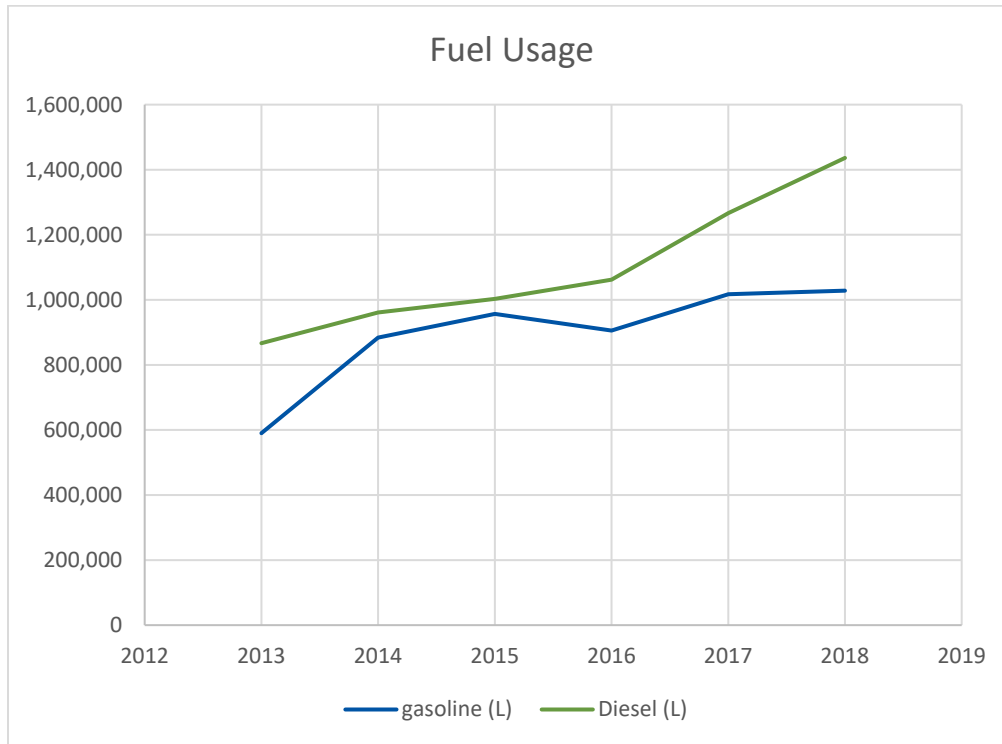
**Figure 1. Overall Emissions Reductions**



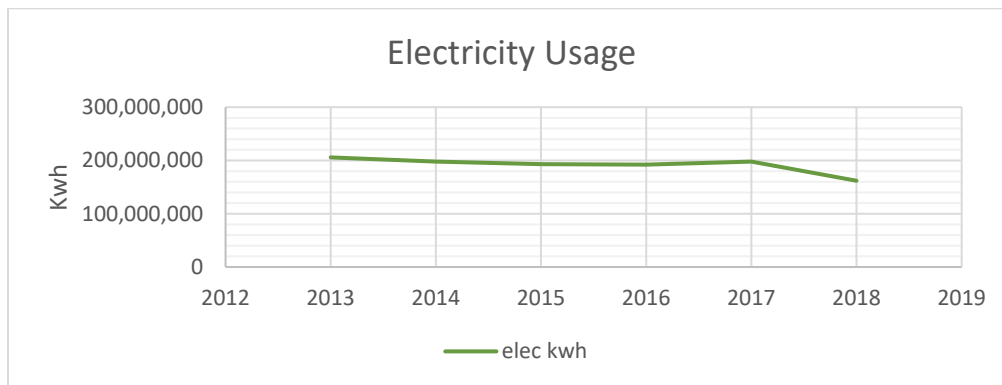
**Figure 2. Scope 1 Reductions: Natural Gas**



**Figure 3. Scope 1 Reductions: Fuel**



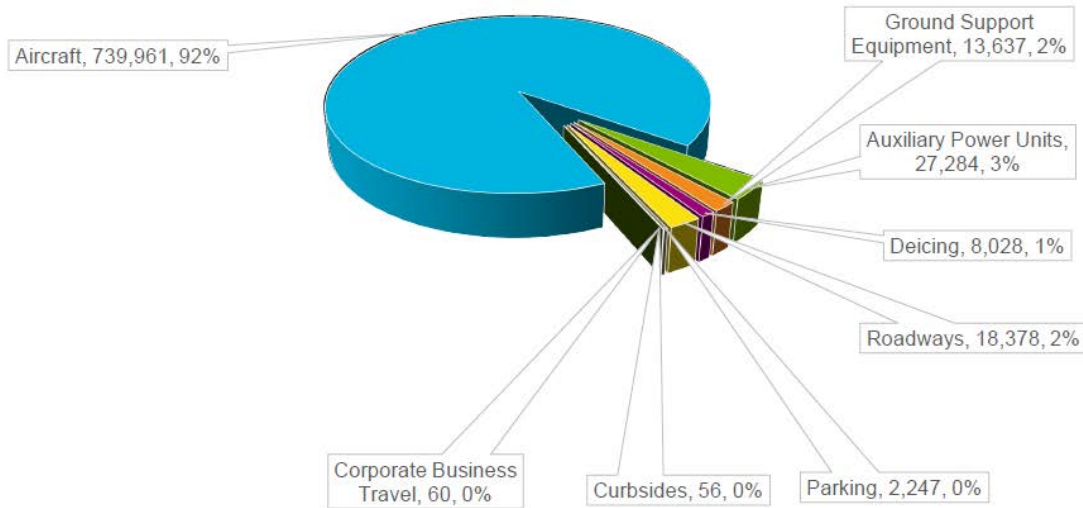
**Figure 4. Scope 2 Reductions**



### Scope 3

In 2018, WCAA started tracking Scope 3 emissions, as well. These are presented in Figure 5 below.

**Figure 5. Scope 3 Emissions (Metric Tons, % of Total)**



## Goals/Objectives

WCAA adopted its first carbon emissions reduction goal in 2016, anticipating a 10% reduction in GHGs by 2020 from the 2013 baseline. The WCAA Sustainability Policy<sup>10</sup>, adopted by the Board in June 2020, set forth a second goal:

*WCAA will develop cost-effective initiatives to reduce electricity, natural gas and vehicle fuel usage and to utilize renewable energy sources to reduce the greenhouse gas emissions of the fuels and energy we do use. WCAA is also committed to work with airport tenants and other stakeholders to provide infrastructure to help stakeholders meet their obligations to individual corporate goals and international agreements. Through this commitment, WCAA will facilitate a reduction in Scope 3 emissions.*

*WCAA will set greenhouse gas emission reduction goals by consulting the scientific research efforts of the Intergovernmental Panel on Climate Change and resolutions by Airport Council International. **WCAA will work towards reducing Scope 1 and 2 emissions by 50% by 2030 using 2013 as the baseline year and facilitating the reduction of scope 3 emissions by 5% by 2025. WCAA aspires to having net zero scope 1 and scope 2 emissions by 2050.***



The goal refers to an absolute reduction in CO<sub>2e</sub>. This roadmap provides additional details on how WCAA plans to meet the goals of a 5% reduction in Scope 3 emissions by 2025, 50% reduction in Scopes 1 and 2 by 2030, and the 2050 aspirational goal of net zero emissions for Scope 1 and 2 emissions. WCAA defines net zero as reducing Scope 1 and 2 carbon emissions to the extent possible and offsetting any remaining Scope 1 and 2 emissions through market programs (such as The Good Traveler) or investment in carbon capture technology.

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<sup>10</sup> WCAA Sustainability Policy. Resolution 20-48. June 17, 2020.  
[https://www.metroairport.com/sites/default/files/business\\_documents/environmental/Sustainability/wcaa\\_sustainability\\_policy\\_res\\_20-48.pdf](https://www.metroairport.com/sites/default/files/business_documents/environmental/Sustainability/wcaa_sustainability_policy_res_20-48.pdf)

## Implementation Actions

WCAA evaluated a wide variety of potential implementation actions during the development of this roadmap that would reduce emissions. WCAA narrowed that preliminary list to the 14 actions described below. Some have already commenced; others are actions WCAA plans to take in the future. Over the course of multiple internal staff meetings, these actions were qualitatively assessed for their impact on emissions, costs, ease, and likely timing. The responsible party was also identified.

### *Action #1: Consolidated Rental Car Center*

**Responsible party:** *Planning, Design and Construction*

<b>Impact on Emissions:</b>	Moderate (with co-benefits)	<b>Ease of Action:</b>	Hard
<b>Cost of Action:</b>	Expensive	<b>Timing:</b>	Medium-term

WCAA has been planning for a consolidated rental car center for some time to reduce vehicle traffic and emissions around the terminals. An interim rental car consolidation is planned for the next few years around the current rental car sites. Feasibility of a mobility terminal is being investigated for the south campus. More information on quantifying emission reductions from group access vehicles is available in Airport Cooperative Research Program (ACRP) Report 180.<sup>11</sup>

### *Action #2: General Energy Efficiency Measures*

**Responsible party:** *Power Systems*

<b>Impact on Emissions:</b>	Varies	<b>Ease of Action:</b>	Easy
<b>Cost of Action:</b>	Inexpensive (small projects) to expensive (large projects)	<b>Timing:</b>	Short-term

Energy efficiency has been the backbone of WCAA’s carbon emissions reductions to date, reducing operating expenses through energy cost savings and optimization of utility rebates. Projects have included obtaining LEED certification for new construction, campus lighting projects, and powerhouse upgrades. In addition, WCAA encourages tenants to undertake energy efficiency measures by promoting utility rebates and offering training opportunities. More information on implementing energy efficiency measures in airport buildings is available ACRP Synthesis 21<sup>12</sup> and ACRP Synthesis 100.<sup>13</sup>

<sup>11</sup> ACRP Report 180: Guidebook for Quantifying Airport Ground Access Vehicle Activity for Emissions Modeling. <http://www.trb.org/Publications/Blurbs/176779.aspx>

<sup>12</sup> ACRP Synthesis 21: Airport Energy Efficiency and Cost Reduction. <http://www.trb.org/Publications/Blurbs/164002.aspx>

<sup>13</sup> ACRP Report 100: Airport Greenhouse Gas Reduction Efforts. <http://www.trb.org/Main/Blurbs/179808.aspx>

### Action #3: Design Standards

**Responsible party:** Planning, Design, Construction

<b>Impact on Emissions:</b>	High	<b>Ease of Action:</b>	Moderate
<b>Cost of Action:</b>	Inexpensive (low scope, done in-house) to expensive (broad scope with consultant support)	<b>Timing:</b>	Short-term

Green building and infrastructure certification programs promote standards that advance energy efficiency and other environmental attributes. WCAA has designed and constructed the most recent buildings (Berry Administration Building, Public Safety Building) on its campus to LEED standards. Likewise, the two most recent runway reconstruction projects have been designed and constructed with Envision standards. WCAA aspires to use these standards in future design and construction projects at the airport. However, WCAA has run into problems as a result of requiring certain energy efficiency standards, such as for construction equipment on federally funded projects, as these standards may violate grant requirements.

WCAA has provided design criteria for its tenants. Design criteria are being revised under a current project “Tenant Design and Construction Guidelines,” which has been suspended due to budget cuts in 2020. However, when it resumes, this project will provide an opportunity to promote energy efficiency to reduce tenant building emissions. More information on best practices on airport design standards can be found in ACRP Report 119<sup>14</sup>, ACRP Report 42,<sup>15</sup> and ACRP Report 80.<sup>16</sup>

### Action #4: Efficient Lighting Projects (Streetlights, Airfield Lights, Terminal Lights)

**Responsible party:** Power Systems

<b>Impact on Emissions:</b>	Varies	<b>Ease of Action:</b>	Easy
<b>Cost of Action:</b>	Varies	<b>Timing:</b>	Short-term

WCAA has converted most lighting around the DTW campus to high-efficiency LED fixtures. However, several lighting projects remain, including streetlighting for roadways and parking lots, as well as runway

<sup>14</sup> ACRP Report 119. Prototype Airport Sustainability Rating System— Characteristics, Viability, and Implementation Options. <https://www.nap.edu/read/22233/chapter/2>

<sup>15</sup> ACRP Report 42. Sustainable Airport Construction Practices. [https://crp.trb.org/acrp0715/wp-content/themes/acrp-child/documents/040/original/ACRP\\_42\\_Sustainable\\_Airport\\_Construction\\_Practices.pdf](https://crp.trb.org/acrp0715/wp-content/themes/acrp-child/documents/040/original/ACRP_42_Sustainable_Airport_Construction_Practices.pdf)

<sup>16</sup> ACRP Report 80. Guidebook for Incorporating Sustainability into Traditional Airport Projects. [http://www.airportsites.net/acrp80/acrp\\_rpt\\_080.pdf](http://www.airportsites.net/acrp80/acrp_rpt_080.pdf)



lighting. Several projects are underway, but remaining projects will be completed as funding allows. For more information on efficient lighting at airports, see ACRP Report 108<sup>17</sup> and ACRP Synthesis 21.<sup>18</sup>

### *Action #5: Participation in DTE in Strategic Energy Management Program*

**Responsible party:** Power Systems

<b>Impact on Emissions:</b>	Moderate	<b>Ease of Action:</b>	Medium
<b>Cost of Action:</b>	Inexpensive	<b>Timing:</b>	Short-term

Detroit Edison Company (DTE) is offering technical support and financial incentives through Strategic Energy Management (SEM). This program offers 24 months of technical support and unique incentives to advance energy management capabilities and establish a continuous energy management process. Program incentives include a \$20,000 SEM Staffing Grant for developing (\$5,000) and completing (\$15,000) an Action Plan, along with \$0.04/kWh and \$0.30/therm, for validated energy savings attributable to SEM program participation that do not receive other DTE incentives. WCAA may earn an SEM incentive of up to 5% of annual energy use capped at \$250,000, throughout the duration of the program. WCAA will receive a portable sub-metering kit for analyzing equipment electricity loads, compressed air leaks, and thermal energy losses. DTE SEM Advisors will develop a multi-variable regression model of site energy use for WCAA. The model will provide a statistically valid method for evaluating energy performance on a daily or weekly basis and for measuring energy impacts of business decisions;

DTE program staff will provide technical assistance, which will include planning and executing an employee engagement plan related to energy awareness, developing a specific plan for an Energy Management Information System, developing a sustainable, continuous energy management process, and training on SEM elements and integration with business systems. The DTE SEM Team will provide specialized energy training on: data analysis to develop capabilities to build normalized energy models and carry out energy analysis in support of energy review; employee engagement; energy management system gap assessment to define strengths and weaknesses in energy management processes and practices; and advanced data analysis to uncover energy waste opportunities. Current SEM efforts are analyzing the central energy plants (North and South) heating and cooling plant operation.

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<sup>17</sup> ACRP Report 108: Guidebook for Energy Facilities Compatibility with Airports and Airspace. <https://crp.trb.org/acrp0267/acrp-report-108-guidebook-for-energy-facilities-compatibility-with-airports-and-airspace/>

<sup>18</sup> ACRP Synthesis 21: Airport Energy Efficiency and Cost Reduction. <http://www.trb.org/Publications/Blurbs/164002.aspx>

## Action #6: Electric Vehicle Charging for Passengers and Employees

**Responsible party:** Strategy Management

<b>Impact on Emissions:</b>	Moderate	<b>Ease of Action:</b>	Hard
<b>Cost of Action:</b>	Expensive (depending on scope and incentives)	<b>Timing:</b>	Medium

DTW has installed electric vehicle charging stations in passenger and employee lots. Monitoring systems and feedback from passengers and employees has indicated that the demand for these charging stations has outpaced the current supply. Along with fleet electrification, WCAA is developing a strategy to address additional charging infrastructure for fleet, employees, and passenger parking. ACRP Synthesis 54 provides a summary of current practices of installing electric vehicle charging at airports.<sup>19</sup>

## Action #7: Electric Buses

**Responsible party:** Environment & Sustainability and Landside Services

<b>Impact on Emissions:</b>	Moderate	<b>Ease of Action:</b>	Moderate
<b>Cost of Action:</b>	Expensive	<b>Timing:</b>	Medium

In 2020, WCAA received a grant from FAA for two electric buses and associated charging infrastructure. The buses, expected to be delivered toward the end of 2021, will be used primarily as employee shuttle buses. These buses will help determine the suitability for future electric buses in the fleet. Several resources describe considerations when deploying electric buses, including a recent report from the Transit Cooperative Research Program (TCRP) on deployment of zero emission buses.<sup>20</sup>

## Action #8: Electric Ground Support Equipment

**Responsible party:** Airlines

<b>Impact on Emissions:</b>	High (with co-benefits)	<b>Ease of Action:</b>	Hard
<b>Cost of Action:</b>	Expensive (but produces savings)	<b>Timing:</b>	Short-term (start) Medium-term (continued efforts)

In 2016, with the assistance of DTE and the Electric Power Research Institute, WCAA performed an audit of existing ground support equipment (GSE) at DTW that could be electrified. Electric GSE (eGSE) has the added benefit of improving local air quality and working conditions for airfield workers. Several airlines own their own equipment at DTW, while several of the smaller operators contract out ground support services and equipment. WCAA has encouraged airlines to consider electrification when possible and has offered partnerships for grant assistance. WCAA has reviewed several GSE policies from other

<sup>19</sup> ACRP Synthesis 54: Electric Vehicle Charging Stations at Airport Parking Facilities.  
<http://www.trb.org/Main/Blurbs/170689.aspx>

<sup>20</sup> TCRP Research Report 219: Guidebook for Deploying Zero-Emission Transit Buses.  
<http://www.trb.org/Publications/Blurbs/180811.aspx>

airports and plans to develop a strategy for deploying charging infrastructure and further encouraging airline investment in eGSE. This strategy is contingent on airline interest and funding.

### *Action #9: Fleet Electrification of Airport-Owned Vehicles*

**Responsible party:** Strategy Management / Fleet Services

<b>Impact on Emissions:</b>	Moderate	<b>Ease of Action:</b>	Hard
<b>Cost of Action:</b>	Expensive (depending on scope and incentives; produces savings)	<b>Timing:</b>	Short-term (start) Medium-term (continued efforts)

In 2019, WCAA purchased the first electric vehicle to be added to its fleet. This vehicle serves as a pilot project to encourage personnel with many different functions to experience electric vehicles and determine their suitability for the airport fleet. While many light duty gasoline powered fleet vehicles have electric or hybrid equivalents, not all of the fleet can be electrified with present technology. WCAA plans to develop a strategy for electrifying the fleet and to purchase additional electric vehicles as funding allows. For current practices on fleet electrification of airport-owned vehicles, see ACRP Synthesis 85.<sup>21</sup>

### *Action #10: Green Power Purchase*

**Responsible party:** Strategy Management / Executive Staff

<b>Impact on Emissions:</b>	Very High	<b>Ease of Action:</b>	Easy
<b>Cost of Action:</b>	Expensive (but may become cheaper)	<b>Timing:</b>	Short-term

WCAA has entertained discussions with DTE regarding their Large-Customer Voluntary Green Pricing Program that allows large utility users to purchase part or all of their electrical supply from remote green generation assets (solar and wind). The proposed 2023+ projects are all solar. This program would enable WCAA to hedge future power costs, with WCAA earning all renewable energy credits (RECs).

### *Action #11: Onsite/Offsite Renewable Energy*

**Responsible party:** Environment / Power Systems

<b>Impact on Emissions:</b>	High	<b>Ease of Action:</b>	Hard
<b>Cost of Action:</b>	TBD (depends on incentives and other factors)	<b>Timing:</b>	Short-term (study) Medium-term (execution)

In 2019, WCAA initiated a solar feasibility study by a consultant team. The purpose of this study was to examine the feasibility of an onsite photovoltaic system and determine sizing and location to inform any potential solicitations for such a system. Due to budget cuts in 2020, the solar study was suspended.

<sup>21</sup> ACRP Synthesis 85: Alternative Fuels in Airport Fleets. <http://www.trb.org/Main/Blurbs/176442.aspx>

However, it may be resurrected if funding allows. Several resources describe best practices for siting renewable energy onsite and offsite, including ACRP Report 197<sup>22</sup> and ACRP Report 151.<sup>23</sup>

### Action #12: Offsets

**Responsible party:** Environment & Sustainability/External Affairs

<b>Impact on Emissions:</b>	N/A (but high impact on reputation)	<b>Ease of Action:</b>	Easy
<b>Cost of Action:</b>	Inexpensive (to facilitate through The Good Traveler) to very expensive (to purchase)	<b>Timing:</b>	Short-term (facilitate through The Good Traveler) Long-term (to purchase)

Obtaining carbon offsets is a way of achieving carbon neutrality. WCAA has purchased carbon offsets for its corporate travel in the past for a minimal amount—less than \$1,000. If WCAA were to offset all Scope 1 and Scope 2 emissions, the presumed cost would exceed \$1,000,000 per year. WCAA believes that offsets should be considered as a last resort and wants to focus its efforts and money on the other implementation actions considered in this roadmap. However, based on passenger feedback, WCAA is interested in pursuing a scheme such as The Good Traveler program<sup>24</sup>, to help facilitate offsets for passengers.

### Action #13: Renewable Natural Gas

**Responsible party:** Power Systems

<b>Impact on Emissions:</b>	High	<b>Ease of Action:</b>	Easy
<b>Cost of Action:</b>	Expensive	<b>Timing:</b>	Medium-term

WCAA has not had experience with the purchase of renewable natural gas but views renewable natural gas as a potential approach to reduce emissions from heating without costly investments in new infrastructure. WCAA aims to explore options for purchasing renewable natural gas in the future. Possible starting points for assessing renewable natural gas are conducting a market analysis, estimating the supply potential in the region, and partnering with a renewable natural gas trade association. ACRP Synthesis 85 describes airport experience with renewable natural gas, which is primarily limited to California airports.<sup>25</sup>

<sup>22</sup> ACRP Report 197: Guidebook for Developing a Comprehensive Renewable Resources Strategy.

<http://www.trb.org/Main/Blurbs/179031.aspx>

<sup>23</sup> ACRP Report 151: Developing a Business Case for Renewable Energy at Airports.

<https://crp.trb.org/acrp0267/acrp-report-151-developing-an-airport-business-case-for-renewable-energy/>

<sup>24</sup> The Good Traveler program is a carbon offset program designed for the airport/aviation industry by the San Diego International Airport in 2015. It now has close to 20 airport partners.

<sup>25</sup> ACRP Synthesis 85: Alternative Fuels in Airport Fleets. <http://www.trb.org/Main/Blurbs/176442.aspx>

### Action #14: Investigate SAF/Future Aviation Trends

**Responsible party:** Airlines

<b>Impact on Emissions:</b>	High (with co-benefits)	<b>Ease of Action:</b>	Hard
<b>Cost of Action:</b>	Expensive (but innovative business models in development)	<b>Timing:</b>	Medium-term

WCAA recognizes that emission from airplanes represents the largest portion of emissions from Detroit Metropolitan Airports. Sustainable aviation fuels (SAF) have been used by various airlines, in limited instances. However, WCAA has not been given strong signals from its airline partners about the use of SAF at DTW. WCAA recognizes that SAF is growing in the aviation sector as it becomes more cost competitive and is open to an infrastructure feasibility study when funds allow. WCAA aims to keep abreast of future aviation trends, including electric planes, and invest in strategies as demand from airline partners dictate. For more information on implementing SAF at DTW, suggested reading includes the Port of Seattle’s Aviation Biofuels Infrastructure Feasibility Study<sup>26</sup> and resources on the Commercial Aviation Alternative Fuels Initiative (CAAFI’s) website.<sup>27</sup>



<sup>26</sup> Port of Seattle. Aviation Biofuels Infrastructure Feasibility Study. [https://www.portseattle.org/sites/default/files/2018-03/Aviation\\_Biofuel\\_Infrastructure\\_Report\\_Condensed.pdf](https://www.portseattle.org/sites/default/files/2018-03/Aviation_Biofuel_Infrastructure_Report_Condensed.pdf)

<sup>27</sup> CAAFI. <http://www.caafi.org>



## Funding Sources

### *Public Funding Sources*

WCAA has leveraged various public funding sources for emissions reducing projects. WCAA has successfully received several FAA grants and utility incentives for energy saving projects. WCAA anticipates continuing to rely on these funding sources for future projects.

### **FAA Funding Sources**

**VALE:** The Voluntary Airport Low Emissions Program improves airport air quality and provides air quality credits for future airport development. Created in 2004, VALE helps airport sponsors meet their state-related air quality responsibilities under the Clean Air Act. Through VALE, airport sponsors can use Airport Improvement Program (AIP) funds and Passenger Facility Charges (PFCs) to finance low emission vehicles, refueling and recharging stations, gate electrification, and other airport air quality improvements. In 2011, WCAA received almost \$2 million for four high-efficiency natural gas boilers with ultra-low NO<sub>x</sub> burners in central power system for the North Terminal (Figure 6), and in 2007, WCAA received over \$5 million for gate power and pre-conditioned air for 26 gates and an underground fuel hydrant system at the North Terminal.

**Figure 6. High-Efficiency Natural Gas Boilers in Central Power System for the North Terminal**



**ZEV:** The Airport Zero Emissions Vehicle (ZEV) and Infrastructure Pilot Program improves airport air quality and facilitates use of zero emissions technologies at airports. Created in 2012, the program allows airport sponsors to use Airport Improvement Program (AIP) funds to purchase ZEVs and to construct or modify infrastructure needed to use ZEVs. In 2020, WCAA received almost \$2 million for the purchase of 2 electric buses and charging units.



**Energy Efficiency Grants:** FAA Modernization and Reform Act (Public Law 112-95) included a program for projects that increase the energy efficiency of airport power sources. This source of project funding can also be used to conduct an airport energy assessment. The FAA legislation made energy efficiency projects eligible for Airport Improvement Program grant funding, without a dedicated special set-aside. Projects funded by the Modernization and Reform Act need to be included in the CIP and follow AIP grant funding requirements.

### **Other Public Funding Sources**

State agencies, such as EGLE and MDOT, also occasionally have funding opportunities for emissions reducing projects. EGLE annually administers the **Diesel Emissions Reduction Act (DERA)** funding opportunities through the Michigan Clean Diesel Program to advocate for newer, cleaner diesel engines in vehicles and equipment. EGLE also anticipates releasing a funding opportunity in 2020/2021 through the **Michigan Volkswagen (VW) Settlement Beneficiary Mitigation Plan**. Such funds may be available for airlines to purchase eGSE. WCAA has offered to help airlines with DERA and VW opportunities through technical grant writing support and by investigating the installation of charging infrastructure. EGLE is also currently partnering with utilities in Michigan to provide funding for electric charging infrastructure through **Charge Up Michigan**.

**Utility rebate and incentives programs** also provide a source of funding for energy saving projects. DTE is the utility provider for WCAA and offers a robust custom, prescriptive, and new construction incentive program for energy efficiency and electric charging stations. WCAA has made use of DTE's programs and has received \$1,765,697.54 in incentives from 2011 through 2020. This translates to energy savings of 22,306,689 kWh Electricity (per year) and 26,454.87 MCF Natural Gas (per year) with emissions savings of 14,684 Metric Tons CO<sub>2</sub>e per year. WCAA anticipates continuing to make use of DTE rebates for future energy saving projects and electric charging stations.

### ***Airport-based Funding Sources***

Match funding for public funding grants and rebates and funding for emissions reducing projects ineligible for grants or rebates have come from the operations and maintenance and capital budgets. However, cost savings and incentives go back into the general fund. WCAA has discussed capturing these savings and incentives to start a revolving fund to finance additional energy efficiency projects.

**Green Revolving Funds (GRFs)** are innovative financial tools that use money in an account to finance a project that both improves efficiency and offers an environmental benefit, such as emissions reductions. Cost savings from the improved efficiency are added back to the original account and can be used toward additional projects. Requiring only an initial investment, a Green Revolving Fund can then pay for subsequent projects that improve efficiency and reduce emissions. A slower alternative is to capitalize the fund with operational savings as they accrue. After a few years there will be sufficient resources to pay for new projects. WCAA has had preliminary discussions about starting a green revolving fund, although its residual budget model makes it difficult to carry over funds from year to year.

### *Third-Party Funding Sources*

WCAA has started to consider the use of **Power Purchase Agreements (PPA)** and **Virtual Power Purchase Agreements (VPPA)** to obtain renewable energy. Under a PPA, an airport contracts with a service provider to install photovoltaic panels on airport property. The service provider typically builds and maintains the equipment for the duration of the contract. Both parties benefit from the guaranteed price and long-term budget certainty. If WCAA moves forward with its solar feasibility study this leads to a solicitation for on-site energy, such a system would most likely be funded through a PPA.

A VPPA results in obtaining renewable energy from off-site solutions. The DTE Large-Customer Voluntary Green Power Program is an example of a VPPA under consideration at WCAA.

**Passenger Voluntary Contributions** are another venue that WCAA has started to consider. A number of passengers have asked about purchasing flight offsets at DTW, and WCAA has had internal discussions about participating in The Good Traveler Program. Passengers can estimate their emissions on The Good Traveler website and neutralize them by paying a relatively modest fee in comparison to the price of their flight. The Good Traveler purchases carbon credits on their behalf, which are verified by third parties and connected to projects in the regions where the airports are located. In 2019, more than 14 airports in the United States were members and posted physical or digital signage in their terminals. This passenger contribution applies to the Scope 3 emissions from the airplanes. Additionally, WCAA may consider whether it can offer passengers the opportunity to purchase offsets equivalent to their share of the Scope 1 and Scope 2 emissions from the airport.

## Metrics and Monitoring

WCAA has performed an annual inventory of carbon emissions from Scope 1 and Scope 2 sources using ACI's Airport Carbon and Emissions Reporting Tool (ACERT) since 2013 and tracks the trends over time. In 2018, WCAA started tracking Scope 3 emissions, with the help of a consultant using FAA's Aviation Environmental Design Tool (AEDT). Subsequently, WCAA has started calculating and tracking Scope 3 emission using ACERT. Scope 1 and 2 emission inventories and data trends are tracked yearly and will be published yearly in an annual report, as stated in WCAA's Sustainability Policy. The Scope 3 emissions inventory will be refined every five years by an external consultant (as funding is available).

WCAA's Zero Emissions Roadmap Committee will continue to meet on an annual basis after the annual report is published. The committee will review emissions data trends and assess progress towards stated goals; revise implementation actions as various realities change, such as stakeholder demand, funding opportunities, new technologies, infrastructure needs, and regulations; and discuss actions and funding priorities for the coming year.

Metrics for tracking carbon emissions are described in the 2017 WCAA Sustainability Program Report<sup>28</sup>:

- Meet Airport Carbon Accreditation requirements of demonstrating consistent progress towards carbon reduction goals
- Measure progress in absolute reductions (in metric tons of CO<sub>2e</sub>) from the 2013 baseline
- Annual renewal of carbon reduction policy statement



Although WCAA does not plan to update its Sustainability Program targets, carbon emissions reduction goals, or target years discussed in the roadmap, there may be future scenarios where a change is warranted. The annual review cycle will provide WCAA the opportunity to evaluate possible scenarios that may warrant such a change. Examples of scenarios which may require a change to the goals could include new local, state, or federal regulatory requirements regarding GHGs, fundamental changes to WCAA's funding mechanisms, or significant technological developments (for example, widespread availability and adoption by airlines of sustainable aviation fuels or significant cost reductions in renewable energy technologies).

If a future change is required, WCAA will report the new goal(s) or metrics along with a description of the circumstances that justified the change(s).

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<sup>28</sup> WCAA Sustainability Program. 2017 Sustainability Program Report. 2017. Accessed at: [https://www.metroairport.com/sites/default/files/business\\_documents/environmental/WCAA%20 Sustainability Program Plan.pdf](https://www.metroairport.com/sites/default/files/business_documents/environmental/WCAA%20Sustainability%20Program%20Plan.pdf)

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