



MID-OHIO REGIONAL
MORPC
PLANNING COMMISSION

111 Liberty Street, Suite 100
Columbus, Ohio 43215
morpc.org

T. 614. 228.2663
TTY. 1.800.750.0750
info@morpc.org

NOTICE OF A MEETING

SUSTAINABLE2050
WEBINAR/CONFERENCE CALL
DETAILS CAN BE FOUND IN THE MEETING INVITATION

Friday, March 19, 2021
9:30 – 11:00 AM
ENERGY

AGENDA

- 9:30 Welcome & MORPC Updates – Jennifer Noll**
- a. Updated Sustainable2050 website
 - b. Regional Sustainability Agenda
 - c. Partnership with Ohio State City & Regional Planning
- 10:00 Spotlight: Energy – Jon-Paul d’Aversa, MORPC**
- a. SWACO Solar Energy Facility
Scott Perry, Director of Operations & Maintenance, SWACO and Paul Curran, PE, Managing Director, BQ Energy LLC

 - b. SWACO Carbon Emissions Management Plan
Jeff Wilkins, Director of Administration, SWACO
- 10:45 Facilitated Discussion**
- 11:00 Adjourn**

PLEASE NOTIFY JENNIFER NOLL AT 614-233-4179 OR jnoll@morpc.org TO CONFIRM YOUR ATTENDANCE FOR THIS MEETING OR IF YOU REQUIRE SPECIAL ASSISTANCE.

The next Sustainable2050 Meeting is
Friday, June 11th, 2021 at 9:30 AM



sustainable 2050

Central Ohio Communities
Working Toward a Better Future

Quarterly Membership Meeting
March 19, 2021



AGENDA

- 9:30** **Welcome & MORPC Updates**
- a. Updated Sustainable2050 website – *Jennifer Noll*
 - b. Regional Sustainability Agenda – *Brandi Whetstone*
 - c. Partnership with Ohio State City & Regional Planning
Kimberly Burton, Assoc. Professor of Practice, OSU
- 10:00** **Spotlight: Energy – Jon-Paul d’Aversa**
- a. SWACO Solar Energy Facility
Scott Perry, Director of Operations & Maintenance, SWACO
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OUR FUTURE ENVISIONED

MID-OHIO REGIONAL PLANNING COMMISSION | 2021 STATE OF THE REGION



WEB PAGE UPDATES

HOME • PROGRAMS & SERVICES • SUSTAINABLE2050

Sustainable2050

SUSTAINABILITY

Sustainable2050 is a program that supports our member communities' sustainability efforts through direct technical assistance, collaboration, and recognition.

We work with Sustainable2050 communities to benchmark their sustainability efforts and track their progress in achieving their sustainability goals and objectives. Our work with these communities gives us an understanding of how all efforts make a collective impact on the quality of life in Central Ohio.

Sustainable2050 is directly tied to the goals and objectives of the [Regional Sustainability Agenda](#).

Ready to Become a Member? ▼

Are you a Bronze, Silver, Gold, or Platinum Sustainable2050 Community? ▼

Tools & Resources ▼

Funding, Technical Assistance & Webinars ▼

★ ADD TO MY FAVES

ABOUT MORPC

PROGRAMS & SERVICES

TOOLS & RESOURCES



CONTACT INFORMATION

Jennifer Noll

614.233.4179

jnoll@morpc.org



WEB PAGE UPDATES

The screenshot shows the MORPC website homepage. At the top, there is a navigation bar with the following links: CONTACT US, NEWS, MEETINGS & EVENTS, COMMITTEES, and LANGUAGE. The MORPC logo is prominently displayed on the left side of the page. Below the logo, the text reads "MID-OHIO REGIONAL MORPC PLANNING COMMISSION". The main content area features a large image of a city skyline with the text "COVID-19 What MORPC is Doing". Below this text are three green buttons: "ABOUT MORPC", "RESOURCE HUB FOR CENTRAL OHIO LOCAL GOVERNMENTS", and "ASK MORPC FOR HELP". At the bottom of the page, there is a white search bar with the text "What can we help you find?".



WEB PAGE UPDATES

The screenshot shows the MORPC website homepage. The browser address bar displays 'morpc.org'. The top navigation menu includes 'CONTACT US', 'NEWS', 'MEETINGS & EVENTS', 'COMMITTEES', and 'LANGUAGE'. A left sidebar contains several menu items: 'Programs & Services' (highlighted with a red box), 'Tools & Resources', 'About MORPC', and 'My Faves'. The main content area features a large image of a person walking on a brick path under a pergola, with a search bar at the bottom that says 'What can we help you find?'. A list of featured programs and services is visible on the left side of the main content area.

Programs & Services

- Active Transportation Plan
- Air Quality
- Competitive Advantage Projects
- Energy Planning
- Gohio Commute
- Government Affairs
- Home Energy Efficiency (Weatherization)
- Home Repair
- Insight2050
- Local Government Energy Partnership
- Metropolitan Transportation Plan
- Paving the Way
- Regional Housing Strategy
- Sustainable2050





CHECK IT OUT!

HOME • PROGRAMS & SERVICES • SUSTAINABLE2050

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★ ADD TO MY FAVES

ABOUT MORPC

PROGRAMS & SERVICES

TOOLS & RESOURCES



CONTACT INFORMATION

Jennifer Noll

614.233.4179

jnoll@morpc.org



A ONE-STOP RESOURCE HUB

Tools & Resources

- [Air Quality Alert Social Media Toolkit](#)
- [Complete Streets](#)
- [insight2050](#)
- [No-Idling Policy Template and Sign Campaign](#)
- [Sustainable Events Guide](#)
- [Central Ohio Solar Toolkit for Local Governments](#)

Funding, Technical Assistance & Webinars

Keep an eye on this section for timely events and funding opportunities.

[SWACO Event Waste Reduction Grant \(EWRG\)](#) – SWACO is now accepting applications for a modified version of the Event Waste Reduction Grant (EWRG) program to help local public events which take place in-person this year. The modified grant application cycle provides a flexible application submission timeline and evaluation process for 2021 in-person events.

U.S. Department of Energy Solar Energy Technologies Office Webinar “100% Clean: How DOE’s Solar Investments Will Help Achieve Ambitious Decarbonization Goals” – On Thursday, March 25, at 3 p.m. ET, the U.S. Department of Energy (DOE)’s acting assistant secretary for Energy Efficiency and Renewable Energy, Kelly Speakes-Backman, and Solar Energy Technologies Office Director Dr. Becca Jones-Albertus will discuss what it will take to create a clean electricity system by 2035 at the webinar



2021-2025 Regional Sustainability Agenda

Brandi Whetstone, Sustainability Officer
MORPC



MID-OHIO REGIONAL
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RSA SUB-COMMITTEE



Chair: Justin Milam, City of Upper Arlington

Vice-Chair: Alex Slaymaker, Columbus Partnership

Membership:

- Emerald Hernandez, City of Columbus Department of Neighborhoods
- Kyle O'Keefe, SWACO
- Nick Plouck, City of Dublin
- James Mako, Fairfield Regional Planning Commission
- Jennie McAdams, Franklin County Public Health
- Basar Ozbilen, Ohio State University
- Dan Sowry, Ohio EPA
- Eric Walli, Honda North America



PROCESS



- Vision and principles
- Sustainable2050 member survey & interviews
- Workshop focused on equity considerations
- Propose and vet goals, objectives, strategies
- Regional stakeholder survey



Regional Sustainability Agenda Lunch and Learn Join us to learn more!

Friday, March 26 from noon-1:00pm

Contact Brandi Whetstone at bwhetstone@morpc.org for the Zoom meeting information



Goal 1

Improve air quality and reduce climate change impacts to protect public health and the environment.



Objectives:

- a. Reduce per capita vehicle miles traveled.
- b. Increase alternative fuel vehicles and infrastructure.
- c. Reduce per capita energy consumption across all sectors.
- d. Increase local renewable energy generating capacity.
- e. Reduce regional greenhouse gas emissions.
- f. Increase the number of days with good air quality.



Goal 2

Protect & preserve natural resources to support healthy & resilient communities and ecosystems.



Objectives:

- a. Reduce the amount of municipal solid waste per capita disposed in the landfill.
- b. Reduce per capita water consumption.
- c. Improve water quality in central Ohio watersheds.
- d. Increase the amount of land devoted to natural areas and ecosystem services.
- e. Prioritize a balanced growth approach to community development. (under review)



Goal 3

Improve quality of life for all residents by creating sustainable and equitable communities.



- Improve transportation safety for all residents.
- Prioritize infrastructure development which supports multi-modal transportation options for all users.
- Increase access to parks and regional trails.
- Reduce household energy cost burden.
- Reduce environmental hazards that pose risks to public health and safety. (under review)



Goal 4

Promote robust, inclusive, and sustainable economic growth and development.



- a. Increase the number of businesses with established sustainability policies and practices.
- b. Maximize infill and redevelopment along existing infrastructure.
- c. Increase availability of affordable housing options near transit or job centers.
- d. Increase employment levels in green jobs.

NEXT STEPS



- Review survey and make final updates
- Review/finalize equity resource document
- RSA Sub-committee final meeting - March 30.
- Sustainability Advisory Committee review/adoption – April 21
- MORPC Board adoption - May or June



BRANDI WHETSTONE

Sustainability Officer

Mid-Ohio Regional Planning Commission

T: 614.233.4174 | **M:** 614.595.8631

bwhetstone@morpc.org

111 Liberty Street, Suite 100

Columbus, OH 43215





SUSTAINABLE2050 INITIATIVE
MORPC-OSU CITY & REGIONAL PLANNING PROGRAM
TECHNICAL ASSISTANCE PILOT PROGRAM

OVERVIEW | MARCH 19, 2021

INTRODUCTION

- Kimberly Burton, P.E., AICP CTP, LEED AP ND
 - Associate Professor of Practice, OSU City & Regional Planning
 - 20+ year career, public and private sectors
 - Sustainability and resiliency, transportation, hazard mitigation, environmental studies, public involvement, and e-learning
 - Teach lecture courses + graduate-level studios - Sustainability Studio, Transportation Studio
 - burton.90@osu.edu | <https://www.linkedin.com/in/kaburton/>



BACKGROUND

- New “pilot” MORPC - OSU City & Regional Planning Program partnership
 - Connected to MORPC’s Sustainable2050 initiative
 - Free sustainability technical assistance for jurisdictions and organizations
 - Semester-long studio project
 - Led by OSU sustainability faculty
 - Work by planning graduate students



MID-OHIO REGIONAL
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THE OHIO STATE UNIVERSITY

EXAMPLE

- Grove City Sustainability Plan
 - OSU Sustainability Studio, completed December 2019



Plan Organization

- Cross-Cutting Topics
 - Equity
 - Health and Safety
 - Community Engagement



- Built Environment
- Natural Environment



- Transportation
- Energy
- Waste Reduction and Recycling



- Business Practices
- City Operations

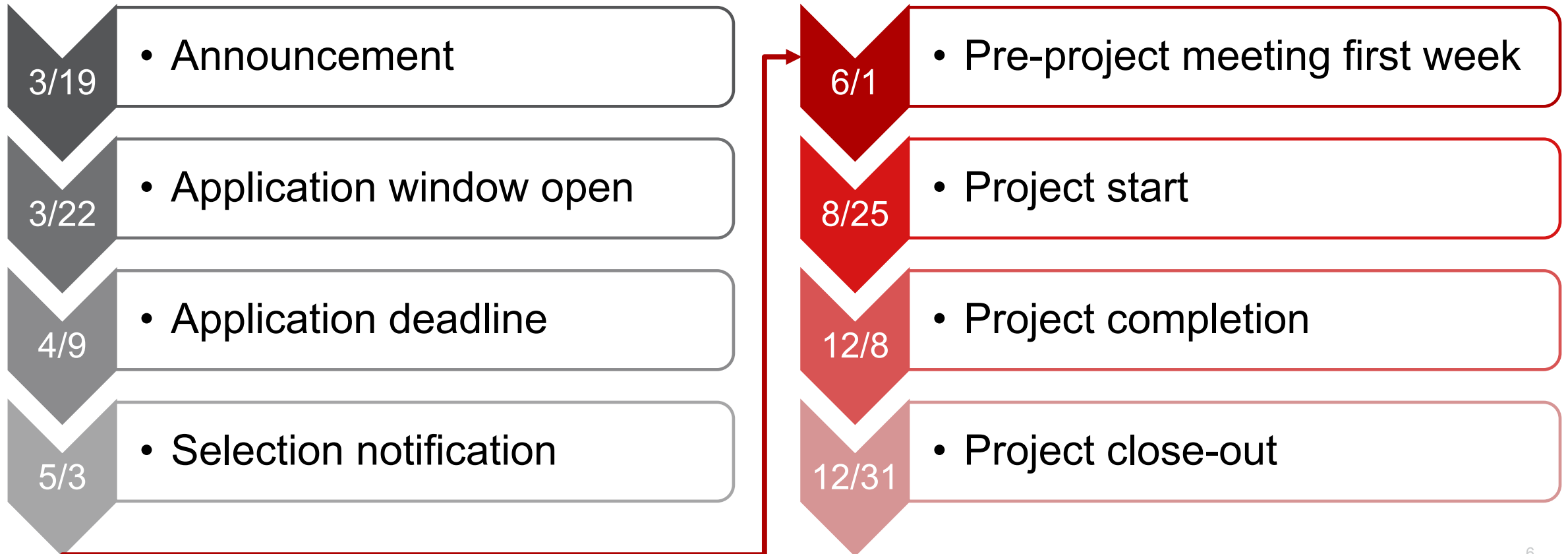


DETAILS

- Applicant eligibility
 - Associated with the MORPC Sustainable2050 initiative
 - Committed to this effort and timeline
 - Multiple jurisdictions/organizations may be involved
- Technical assistance requirements
 - Involve sustainability and/or resiliency
 - “Right-sized” = ~medium-sized project
 - Planning-related technical assistance but otherwise flexible

**MORPC will send
an email
with a link
to the
online application
on 3/22**

TIMEFRAME





SUSTAINABLE2050 INITIATIVE
MORPC-OSU CITY & REGIONAL PLANNING PROGRAM
TECHNICAL ASSISTANCE PILOT PROGRAM

QUESTIONS?

MORPC contacts

Brandi Whetstone, bwhetstone@morpc.org

Jen Noll, jnoll@morpc.org

OSU contact

Kimberly Burton, burton.90@osu.edu

MORPC ENERGY PLANNING RESOURCES



MORPC

- [MORPC Energy Planning Services and Roadmap](#)
- [Local Government Energy Partnership](#)
- [Central Ohio Solar Toolkit for Local Governments](#)
- Regional Energy Strategy
- SolSmart Designation
Inspection and Permitting Webinar
March 25 10am-Noon
Please contact Lynn Kaufman (lkaufman@morpc.org)

MORE INFORMATION:

<https://www.morpc.org/program-service/energy-planning/>

Email: jpdaversa@morpc.org





Columbus Solar Park

SWACO
FROM WASTE TO RESOURCES



BQ ENERGY LLC

SWACO History of Model Landfill

- Operated from 1967 – 1985
- 1993 - Ownership transferred to SWACO
- 1999 - Golf course developed
- 1999 - Third party began operation of the Gas Collection and Control System
- 2014 – Golf course closed and SWACO began operation of the GCCS.

Land Feasibility Study

In 2017, SWACO contracted with ARCADIS to perform a land feasibility study. The main goals of the study was to Identify, develop and implement land development and/or alternative energy development at the Model Landfill to:

- Promote SWACO’s mission, “to improve the community’s solid waste stream through effective reduction, recycling, and disposal.”
- Create financial sustainability for continued post-closure O&M of the Model Landfill.
- Contribute to SWACO’s guiding principles of collaboration, operating with efficiency and fiscal responsibility, contributing to a safe and healthy community, and engaging the community through education and outreach.

Solar Project

- In 2018, the SWACO Board of Trustees made the decision to develop the closed site into a solar energy facility.
- In 2019, SWACO publicly advertised an RFP for solar energy developers that will design, own, and operate a ground-mounted solar photovoltaic (PV) generation system at the Model Landfill.
- In 2020, BQ Energy, LLC was deemed the Successful Proposer of the Solar Array Project. The Board of Trustees approve the land lease of +/- 173 acres with Columbus Solar Park, LLC, an affiliate of BQ Energy, LLC.

Model Landfill

The landfill area is 186 acres.



The Benefits of the Solar Project

- Meets SWACO goals, taking a piece of land that is unusable and transforming the property into generating jobs and revenues for the communities.
- SWACO reaches its goal making the site financially sustainable and helps to maintain lower tipping fees for the communities and businesses in Franklin County.
- The project has greater environmental effect within the region by producing clean, renewable energy.
- Allows SWACO to develop educational programming and add to our community's recycling and composting infrastructure.

COLUMBUS SOLAR PARK



March 2021



BQ Energy Company Profile

- **World-wide experience in project development and a leader in developing renewable energy on brownfields and landfills since 2002.**
- **Developed medium-sized wind energy projects (5-50 MW) and utility scale solar PV (1-100 MW).**
- **Develop, Build, Own & Operate Projects in many different locations.**
- **Sell power to owners, third parties, or transmission market.**
- **Existing financial relationships with KeyBank, M&T Bank, NY Green Bank, and other financial relationships.**



Samples of Our Experience

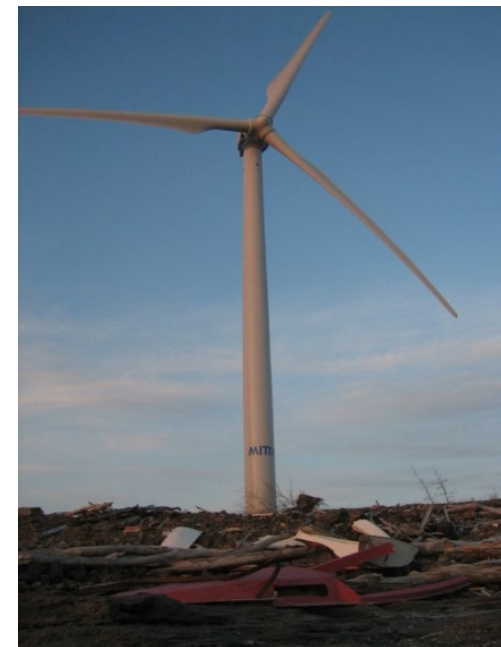


Steel Sun (2016)

4 MW photovoltaic project adjacent to Steel Winds

Steel Winds (2006 & 2012)

35 MW Wind facility located on an abandoned steel mill in Lackawanna, NY. Numerous energy and environmental awards



Annapolis, MD (2017)

18 MW PV Facility on municipal landfill. Largest landfill solar project in the US



Sunlight Beacon (2018)

2.8 MW photovoltaic facility on a landfill in Dutchess County, NY

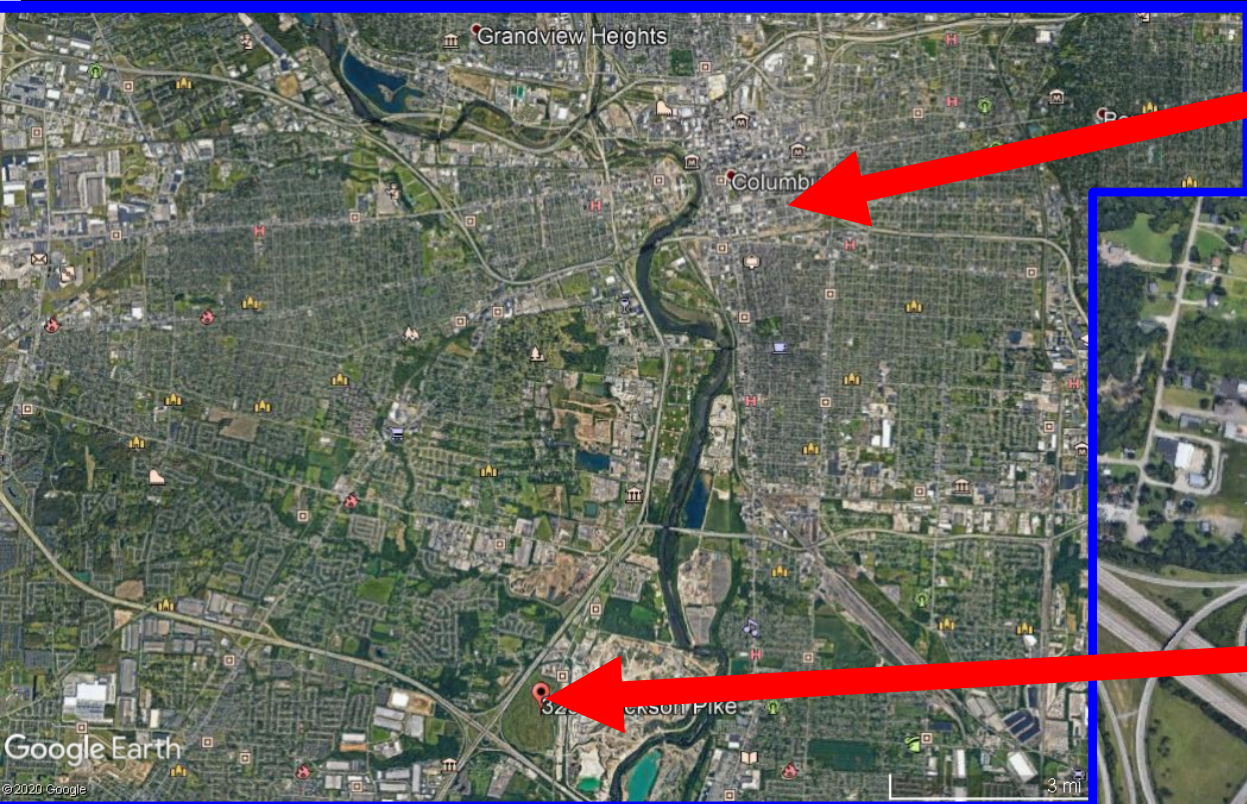


Landfill Solar Compared to Other Land-Use Options

- Solar farms are one of the safest and most productive ways to reuse landfills.
- Solar projects are minimally invasive to build, silent to run, and produce no harmful byproducts. They have the benefit of keeping the landfill itself protected from damage caused by vehicles, foot traffic, and other recreational activities.
- Solar farms are under long-term agreements developed with accurate output models, ensuring decades of safe and stable economic benefits.
- **With the current design, the Columbus Solar Park would be larger than any existing landfill solar project in the country.**



Columbus Solar Park- The Location



**DOWNTOWN
COLUMBUS**

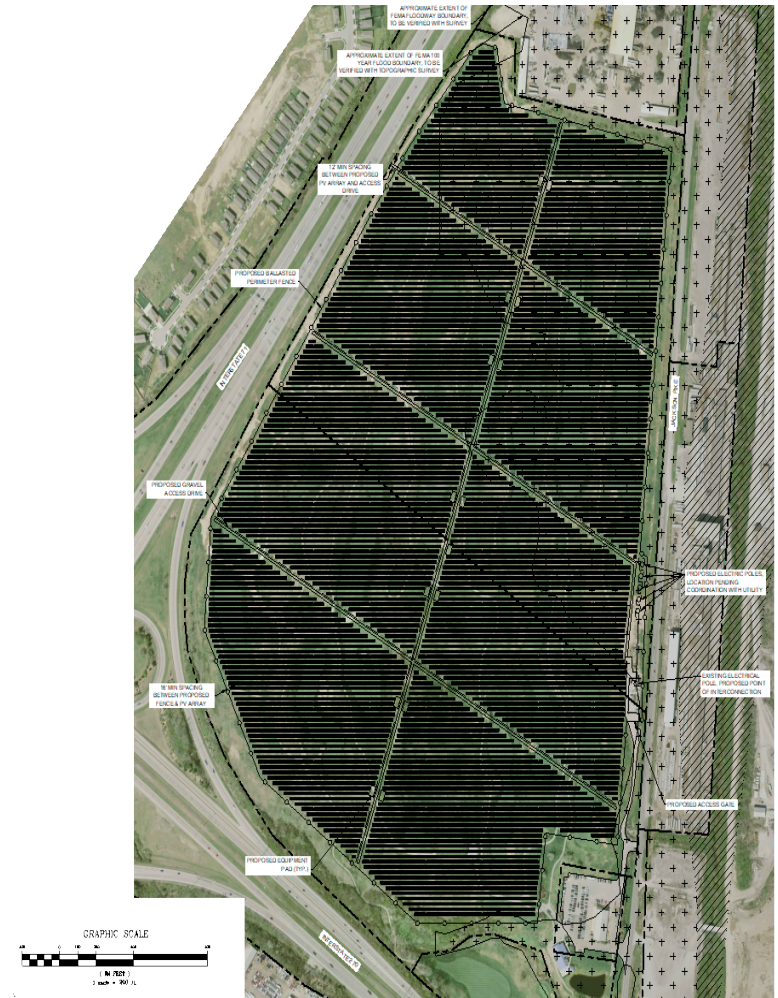


**SWACO SITE,
Jackson Township**



Columbus Solar Park- Description of the Project

- Solar array will be installed on the surface of the SWACO landfill
- About 50 MW of electric power will be produced (about 5,000- 9,000 homes annual usage equivalent)
- About \$70 Million in capital cost
- Construction in 2022
- SWACO will be the landlord and project supporter



Columbus Solar Park- Impact to the Landfill Integrity

- Solar Project will not impact the landfill environmental integrity
- Above ground foundations will be used to avoid any contact with the waste materials
- Some grading of the golf course features and fill will occur.
- All surface vegetation will be restored and maintained by the Solar Park
- Erosion control measures will be employed during construction



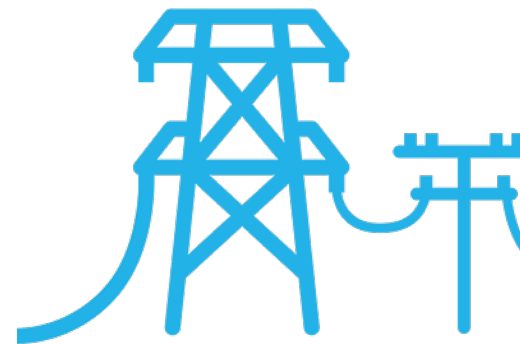
Columbus Solar Park- Permitting

- Project must conform with all Federal, State, local environmental and electrical codes.
- All structures will have aboveground foundations, so that the impact on the existing landfill integrity will be minimal.
- There will be some grading work onsite to make the terrain more appropriate for a solar array (and less for a golf course)
- Public meetings will be held during the permit process to ensure appropriate communication and input.



Columbus Solar Park- Electrical Interconnection

- Solar farm will interconnect with existing nearby power grid into existing nearby wires owned by the City of Columbus Department of Public Utilities.
- We are currently doing extensive studies with the City to ensure that under all circumstances the delivery of electric power will be done safely and reliably.
- The Columbus Solar Park will be required to pay for all costs associated with interconnecting with the area grid and any new facilities that the grid owner would need to install.



Columbus Solar Park- Power Sales

- The electricity produced on an annual basis is the equivalent of the power used by about 5,000- 9,000 Columbus area homes.
- We have been selected by AEP to enter into a long term contract whereby AEP will use this power source as part of its supply contract to the City of Columbus. The City is committed to implementing an electric community choice aggregation program powered 100% by renewable energy by 2022. The power will be distributed via existing wires and at no time will the reliability of area or local power delivery be impacted.



Columbus Solar Park- Schedule

Milestone Task	Date
SWACO/BQ Energy Lease Complete	June 2020
Initial Design Complete	August 2020
Electrical Interconnection Studies Started	September, 2020
Power Sales Complete	October 2020
Major Permit Applications Started	January 2021
Major Permits Approved	November 2021
Electrical Interconnection Agreement	February 2022
Project Finance Secured	March 2022
Commercial Operation	December 2022



Columbus Solar Park- Capital Cost & Economic Development

- The Columbus Solar Park is estimated to cost around \$70 Million to build, not including indirect services.
- It is in everyone's interest to contract with local businesses for as much of the project scope as possible.
- The project will pay a significant rent to SWACO, impacting the economics of their future pricing to members and stakeholders.
- The project expects to make normal payments in lieu of taxes (PILOT) as per Ohio norms.





**BQ Energy Development llc
400 Market Industrial Park, Suite 32
Wappingers Falls, NY 12590**



Carbon Emissions Management Plan

Jeff Wilkins, Director of Administration
March 2021

A Changing Climate

- Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and certain fluorinated gases, referred to as “carbon emissions,” absorb infrared radiation, thus trap & hold heat
- UN’s Intergovernmental Panel on Climate Change projects global average temperature to increase as much as 4.8°C (8.64°F)
- An increase above 1.5°C (2.7°F) will have significant impacts on climate change
 - To stay within 1.5°C (2.7°F) increase, global emissions must be reduced by 45% by 2030 (relative to 2010 levels)
 - Net zero emissions must be achieved by 2050



Vision

“A community that is environmentally safe and resourceful.”

Mission

“Manage the waste stream to enable community growth, prosperity, and environmental stewardship.”

Strategic Goal – Leadership, Advocacy and Excellence

“Demonstrate leadership in thought and action throughout our district, and provide enhanced performance within our organization to drive towards greater environmental sustainability, resourcefulness, social impact, and economic benefit.”



Guided by SWACO's Vision, Mission, & Goals

- Initially, SWACO set a high-level strategic goal is to reduce our carbon footprint and determine our desired outcome by 12/31/2020
- To determine desired outcome and enable employees to “walk the walk”, we created Carbon Emissions Management Working Group
- Working Group also developed a Carbon Emissions Management Plan (“CEMP”) that identifies measures to reduce the carbon footprint of SWACO facilities through a participatory decision process

CARBON EMISSIONS MANAGEMENT PLAN

Prepared for SWACO
February 2020

prepared by



Planning Process

Plan serves as the guiding framework to reduce our carbon footprint for assets managed by SWACO and follows a methodical approach:

- Carbon Footprint Evaluation
 - Establish baseline and routinely monitor our carbon footprint
- Benchmarking
 - Identify industry best practices for carbon emission reductions
- Goal Establishment
 - Set realistic, measurable goals to address carbon emissions
- Implementation
 - Prioritize sustainable, economic and strategic initiatives



Developing a Baseline

- Completed an emissions inventory to calculate SWACO's carbon footprint
- Utilized Local Government Operations Protocol
 - Developed by the International Council for Local Environmental Initiatives and The Climate Registry
- 2017 was established as the baseline year
 - Reference point to develop future organizational goals & prioritize actions



Developing a Baseline

- Source of Emissions – Scopes 1, 2, 3
 - Scope 1) Direct emissions from sources owned/controlled by SWACO
 - Scope 2) Indirect emissions from generation of energy offsite & then purchased by SWACO such as electricity or natural gas
 - Scope 3) Other indirect emissions influenced by SWACO activities, but not owned and/or controlled by SWACO such as grants to community diversion projects and the District's composting program
- Velocity EHS Software tool for tracking Scopes 1 & 2 emissions and analysis



Global Warming Potential (GWP)

- Each emission source traps different amounts of heat in the Earth's atmosphere (GWP)
- Protocol's methodology uses a standard unit of measurement called carbon dioxide equivalent (CO_2e)
- CO_2e compares Global Warming Potential from emissions sources

Emission Source	Global Warming Potential
Carbon Dioxide	1 (baseline unit)
Methane	25
Nitrous Oxide	298



2017 Baseline Carbon Emissions Summary

Emission Source	Annual CO ₂ e Emissions (metric tons)	Percent of Total Emissions	Percent of Total Emissions (Excluding Landfill Gas)
Landfill Gas	149,963	95.83%	-
Vehicle/Equipment Fuel	5,622	3.59%	80.51%
Building Electricity	1,647	1.05%	23.58%
Building Fuel	77	0.05%	1.10%
Waste Material	33	0.02%	0.48%
Recycled Material	-396	-0.25%	-5.67%
Total	156,496		
Total (Excluding Landfill Gas)	6,983		



Benchmarking

A benchmarking assessment was conducted to identify best practices with similar operations to SWACO's

Organization	Organization Type	Key Attributes
Frito Lay (OH)	Manufacturer	<ul style="list-style-type: none">• Fleet operations• Waste management
King County (WA)	County government	<ul style="list-style-type: none">• Purchasing• Waste management• Facility Management
Recology (CA)	Private waste management company	<ul style="list-style-type: none">• Waste management• Facility management• Fleet operations
Green Waste Recovery, Inc. (CA)	Private waste management company	<ul style="list-style-type: none">• Waste management• Facility management• Fleet operations• Purchasing
Oberlin College (OH)	College	<ul style="list-style-type: none">• Facility management
SteelCase (MI)	Design company	<ul style="list-style-type: none">• Facility management



Goal Setting

- Objective to calculate a science-based emission reduction target grounded in objective, current scientific data
- Science-Based Target Initiative (SBTI)
 - Model created by Carbon Disclosure Project, the United Nations Global Compact, World Resources Institute, and the World Wide Fund for Nature
 - Model considers the Paris Agreement objective to limit the global average temperature increase to 1.5°C (2.7°F)
- For SWACO's waste management industry type, the recommended method was an absolute contraction method that allocates the global carbon emissions budget applied to all companies equally



Goal Setting

- Establish a goal that captures the changing population of the District and the evolving operations of SWACO
- Carbon emissions vary depending on the intensity of activities, thus an operational metric of “tons of material processed” organization-wide goal was selected
- As of the 2017 baseline year, SWACO’s emission rate is 0.14 tCO₂e per ton of material processed (1,038,215 metric tons of material)



Goal Setting

- To meet the science-based target, we would achieve an emission rate of 0.05 tCO₂e per ton of material processed by 2032
- **What does that mean?**
- Reduce our carbon footprint 64% reduction by Year 2032



Carbon Management Strategic Areas

- Landfill Gas Emissions Management
- Vehicle/Equipment Fuel Management
- Building Energy Management
- Waste Management



Carbon Emissions Management

- Four working groups created to implement the plan
- 19 staff involved to accomplish 33 initial actions
- Verify metrics annually
- Review annual emissions report
- Create new actions to reduce carbon emissions
- Complete further evaluation utilizing decision trees



2020 Initiative – Building Electricity

- Conduct an Energy Audit of facilities
 - Identified energy-saving measures that could result in a reduction of over 273 tons of CO₂e/year
- By switching energy suppliers, all facilities are powered by 100% renewable energy
 - Resulting in reductions of approximately 1,324 tons of CO₂e/year
- Smart meter installation in all facilities
- Retrofit existing buildings with efficient lighting, LEED design of new buildings and renovations



2020 Initiatives – Landfill Gas & Vehicles and Equipment

- Planted 50 trees on SWACO's campus
- Formalized anti-idling policy
- Purchased 3 new Tier IV heavy equipment units to operate at FCSL
- Previous Landfill Gas-to-Energy project produces enough renewable gas to serve over 13,000 homes



2020 Initiatives – Waste Management

- Reduced paper use by 52% with increased electronic communications and documentation
- 57% of office supplies purchased contain recyclable content
- Deliveries to the Administrative Office Building were reduced by 57%



2020 Initiatives - Investing in the District

- Awarded \$74,000 in Community Waste Reduction Grants specifically to target organic material waste
- Launched the Food Waste Champion Program
- Partnered with BQ Energy to develop, build, & operate a solar energy facility on the Model Landfill
 - The energy produced can power over 5,000 homes



Looking Forward

- Electric pickup trucks and on-site charging stations
- Conducting waste audits of all SWACO facilities
- Campus buildout on existing site (LEED standards)
- Organics Management Planning Project
- LED lighting upgrades at Morse Road and Jackson Pike Transfer Stations
- Compactor to increase load efficiencies at Morse Road TS



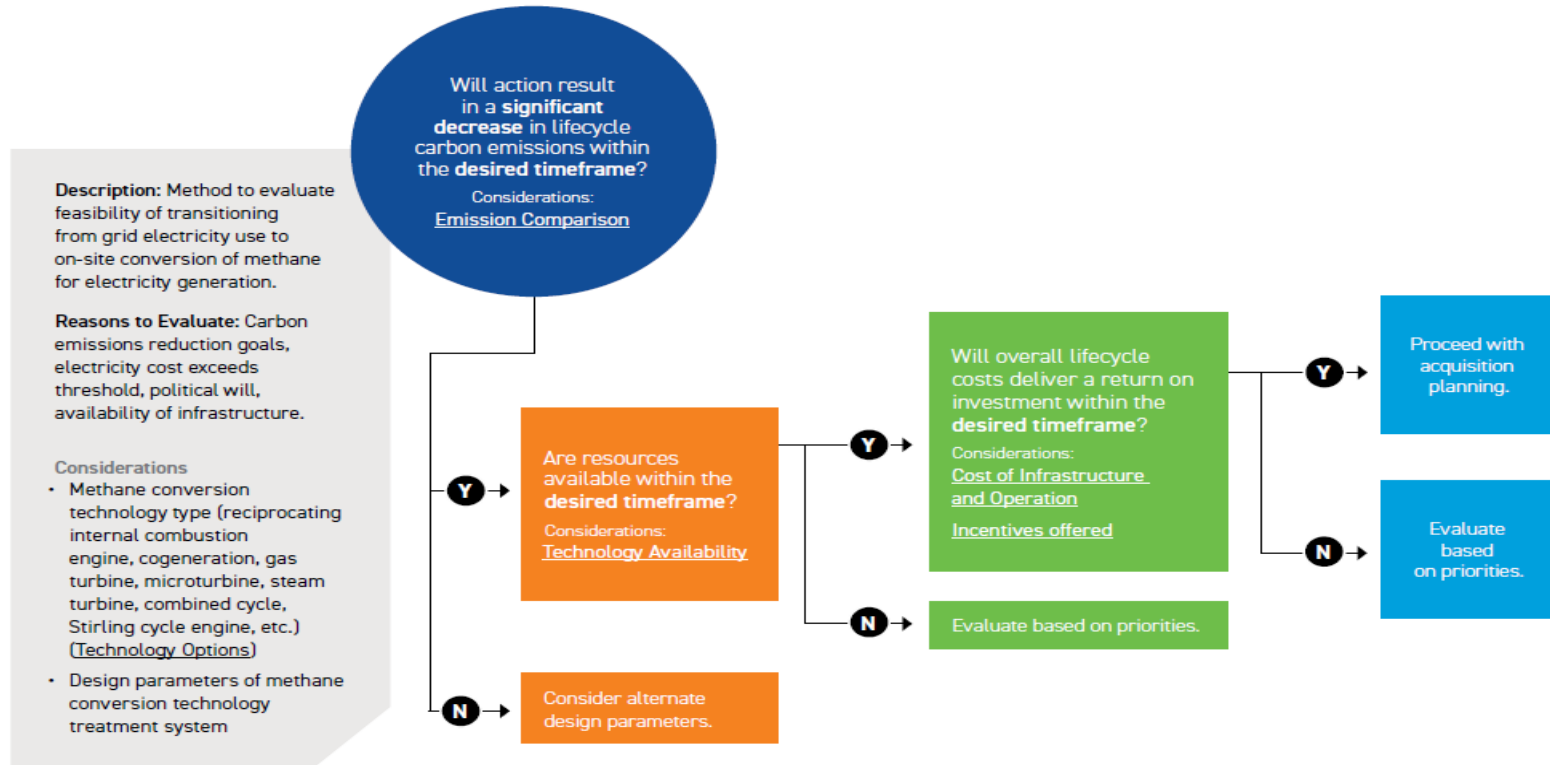
Areas for In-depth Analysis

“Decision Trees” created to guide analysis -

- On-site Methane Use
- Converting to CNG Trucks
- Converting to Electric Vehicles
- On-site Geothermal Heating
- Converting to Solar Energy



Decision Tree Example – On-Site Methane Use



Decision Tree Example – On-Site Methane Use

Decision Tree: On-Site Methane Use (Appendix C1)

Resource Guide

Emissions Comparison:

"Landfill Gas Energy Benefits Calculator,"
"Photovoltaic Watts Calculator." U.S.
Environmental Protection Agency,
Landfill Methane Outreach Program.

<https://www.epa.gov/lmop/landfill-gas-energy-benefits-calculator>

Enter capacity of technology.

Technology Options and Availability:

"Landfill Gas Energy Project Development
Handbook, Chapter 3 Project Technology
Options." U.S. Environmental Protection Agency,
Landfill Methane Outreach Program.

https://www.epa.gov/sites/production/files/2016/09/documents/pdh_chapter3.pdf

*See description of options. Availability
resources vary depending on technology*

Cost of Infrastructure and Operation:

"Landfill Gas Energy Cost Model." U.S.
Environmental Protection Agency,
Landfill Methane Outreach Program.

<https://www.epa.gov/lmop/lfgcost-web-landfill-gas-energy-cost-model>

Enter parameters of project.

Incentives Offered:

"DSIRE Database of State Incentives
for Renewables and Efficiency."
U.S. Department of Energy.

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