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Better Buildings®
U.S. DEPARTMENT OF ENERGY

Leveling the SLOPE: Helping State and Local Governments Reach Their Energy Goals

March 16, 2021

3:00 – 4:00 pm EDT

U.S. DEPARTMENT OF ENERGY

Adam Guzzo

U.S. Department of Energy

Weatherization & Intergovernmental Programs Office (WIP)

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Agenda

1. Welcome & Introduction to the State and Local Planning for Energy (SLOPE) Platform
2. Background: Milwaukee's Goals and Energy Planning Needs
3. SLOPE Demonstration and Application for Milwaukee
4. Questions & Discussion

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Poll 1

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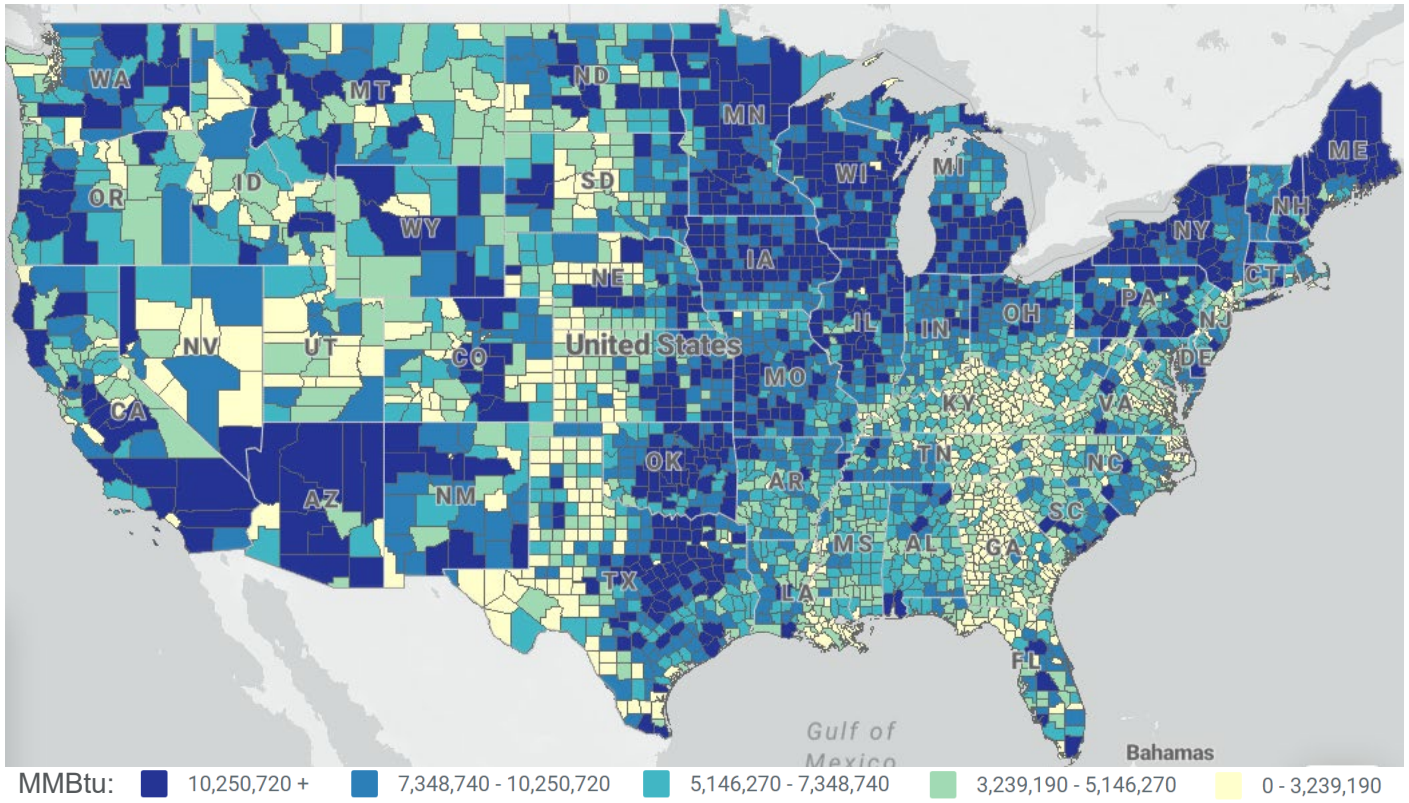
State and Local Planning for Energy (SLOPE) Platform

Visualize Your Energy Future with SLOPE

Technical Generation Potential - Distributed Wind, by County (2017)



MMBtu: 10,250,720 + | 7,348,740 - 10,250,720 | 5,146,270 - 7,348,740 | 3,239,190 - 5,146,270 | 0 - 3,239,190

SLOPE integrates and delivers data on energy efficiency, renewable energy, and (coming Spring 2021) sustainable transportation into an easy-to-access online platform to enable data-driven state and local energy planning.

NREL Transforming ENERGY

U.S. DEPARTMENT OF ENERGY
Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Visit SLOPE: gds.nrel.gov/slope

Comments or Questions?
slope@nrel.gov

What Types of Questions Can SLOPE Answer?

Consumption

What are the current and projected electricity consumption and expenditures by sector in my jurisdiction?

Efficiency

What is the energy efficiency savings potential in my jurisdiction and what are the most cost-effective measures for single-family homes in my state?

Renewables

What is the comparative generation potential of renewable energy technologies in my jurisdiction compared to surrounding jurisdictions?

Sustainable Transportation (coming soon)

What could future electricity and fuel consumption and vehicle miles traveled look like under different transportation scenarios?

Cost of Energy

How do the costs of utility-scale and distributed renewables, fossil fuels, energy storage, and efficiency compare in my jurisdiction?

Generation Scenarios

What could the mix of renewables and fossil fuel generation on my grid look like under different scenarios?

How Are State and Local Governments Using SLOPE?

New Mexico's Energy Conservation and Management Division:
- Clean Energy Program Manager
- Clean Energy Economist
- Engineering Tech Program Manager

→ Seeking data to guide planning of Grid Modernization Roadmap Project

Maine Governor's Energy Office:
- Climate Council Energy Working Group

→ Using levelized cost of energy (LCOE) data in modeling, and to augment professional energy modeling they have contracted

Miami Resilience and Sustainability Office:
- Climate Change Mitigation Coordinator

→ Informing building efficiency ordinances, renewable energy pilot programs, community outreach and education, and future generation planning (in collaboration with utility)

What Data is Available in SLOPE?[1]

Energy Consumption*

- Electricity and natural gas consumption and expenditures: projected in a business-as-usual case for the residential, commercial, and industrial sectors through 2050

Transportation *(coming in Spring 2021)*

- Current and projected on-road vehicle fuel consumption and vehicle miles traveled
- Current and projected vehicle registration data by fuel type

Energy Efficiency

- Electricity savings potential for residential, commercial, and industrial sectors through 2035
- Electricity and fuel savings potential from cost-effective single-family home energy improvements

Solar

- Utility-scale photovoltaic (PV), floating PV, **residential rooftop PV, and commercial rooftop PV** technical potential
- Concentrating solar power utility-scale technical potential

Wind

- Land-based, offshore, and **distributed wind** technical potential

Bioenergy

- Biopower technical potential

Geothermal

- Utility-scale geothermal technical potential
- **Geothermal district heating economic potential in new construction and existing buildings**
- **Geothermal heat pump economic potential**

Hydropower

- Utility-scale hydro generation potential
- **New stream reach and non-powered dam generation potential**

Generation Scenarios

- **Modeled current and projected electricity generation mix through 2050 by state under 12 scenarios**

Cost of Energy

- Levelized cost of energy: projected electricity costs for 16 **generation technologies plus battery storage** through 2050
- **Program administration cost of saved electricity**

Commercial Buildings*

- **Commercial building count and area by size and property type for 2020**

Demographics*

- Population: past and projected population from 2015-2050

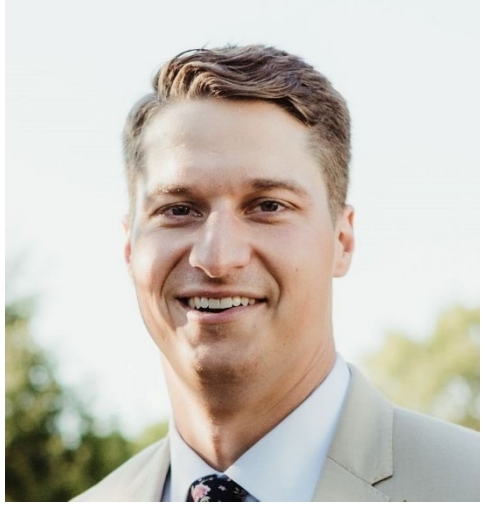
City-level data added for~6,000 cities in December 2020.

Bold text is new data added in 2020.

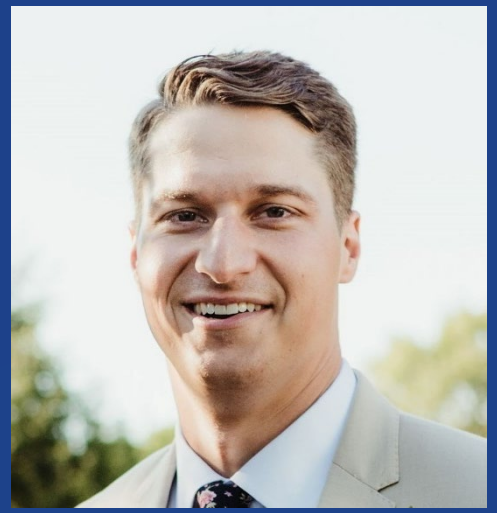
[1]For a list of SLOPE's data sources, please see SLOPE FAQs – "What are SLOPE's Data Sources" (https://gds.nrel.gov/slope/about)

Today's Presenters

Megan Day
National Renewable Energy Laboratory



Matthew Donath
City of Milwaukee



Matthew Donath

City of Milwaukee

City of Milwaukee

Wisconsin's largest City and 4th largest Great Lakes City – population ~600,000
Population Demographics – 38% Black, 35% White, 20% Hispanic, 5% Asian

Old building stock –

- 70% of single family and multi-family units built before 1955
- Commercial and industrial building stock is similarly aged – early to pre-1900's
- ~42% of housing units are owner-occupied

Utility Electric Generation Fuel Mix – Coal 37%, Natural Gas 32%, Renewables 7%, Other 24%

Milwaukee's Sustainability Goals

Office of Environmental Sustainability created in 2006

ReFresh MKE Sustainability Plan launched 2013

8 primary issue areas with ten-year goals & targets (2013-2023)

Major energy goals:

- 25x25 – 25% RE by 2025
- Better Buildings Challenge – 20% energy reduction across city portfolio and commercial building sector

Climate Planning in 2021

Milwaukee's Mayor and Common Council created a City-County Task Force on Climate and Economic Equity in 2019

Established community wide GHG goals:

- 45% reduction by 2030
- Net zero by 2050 or sooner

Task Force Climate Plan – how do we reach GHG reduction goals with a focus on equity and local job creation?

Data Questions

1. What sectors should Milwaukee focus on that will have the biggest impact on reducing emissions by 2030?

2. As Milwaukee works to meet its energy and climate goals, how does the city ensure that the benefits of a clean energy economy are realized by energy burdened communities and help mitigate racial and economic inequity? And how can the city ensure that energy costs are not raised for burdened communities?

3. How much of Milwaukee's energy consumption could be met by locally generated renewable energy?

4. What renewable technologies are most-cost effective in Milwaukee over time?

Megan Day

National Renewable Energy Laboratory

SLOPE Demonstration

Visit SLOPE: gds.nrel.gov/slope

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Milwaukee SLOPE Uses

1. Data used to suggest planning prioritization to Climate and Equity Task Force

2. Identify building sector, type, and size that would be most impactful as program priorities

3. Use SLOPE's charts and graphics as communication tool with the public and elected officials

4. Compare SLOPE data to GHG Inventory and projections for validation

Q & A

Submit Questions
www.slido.com event code **#DOE**

U.S. DEPARTMENT OF ENERGY

Polls 2 - 4

We'd like to hear from you!

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Additional Resources

- SLOPE
- Upcoming SLOPE Stakeholders Webinars (opportunity to provide input on future SLOPE enhancements):
  - Register for the Tuesday, March 30, 2021 webinar
  - Register for the Thursday, April 8, 2021 webinar
- Low-Income Energy Affordability Data (LEAD) Tool
- Low-Income Community Energy Solutions
- State and Local Solution Center
- Energy Efficiency and Renewable Energy Resources for State and Local Leaders
- Guide to Community Energy Strategic Planning
- Milwaukee Climate and Equity Plan

MAY
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2021

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2020-2021 Better Buildings Webinar Series

BUILDING RESILIENT COMMUNITIES:
STATE AND LOCAL PERSPECTIVES

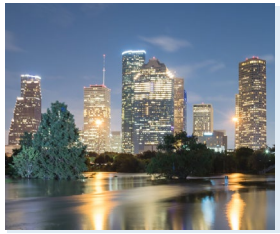
Tue, Sep 15, 2020 | 3:00 - 4:00 PM ET

WATCH RECORDING

SCALING IMPACT:
MULTI-BUILDING APPROACHES TO CARBON REDUCTION

Tue, Dec 1, 2020 | 3:00 - 4:30 PM ET

WATCH RECORDING



PERSPECTIVES ON RESILIENCE:
INSUARANCE AND CREDIT UNDERWRITING

Tue, Feb 9, 2021 | 3:00 - 4:00 PM ET

WATCH RECORDING

INNOVATIVE ENERGY EFFICIENCY FINANCING IN PUBLIC HOUSING

Tue, Sep 22, 2020 | 3:00 - 4:00 PM ET

WATCH RECORDING

SAVE ENERGY AND MONEY WITH THE BUILDING ENVELOPE CAMPAIGN

Tue, Dec 8, 2020 | 3:00 - 4:00 PM ET

WATCH RECORDING

SMART TOOLS FOR SMART LABS

Tue, Mar 2, 2021 | 3:00 - 4:00 PM ET

WATCH RECORDING

CPACE FINANCING TURNS 10:
IMPACTS, CHALLENGES, AND WHAT COMES NEXT

Tue, Oct 6, 2020 | 3:00 - 4:00 PM ET

WATCH RECORDING

BEYOND ENERGY SAVINGS:
QUANTIFYING THE ADDITIONAL BENEFITS FROM ENERGY EFFICIENCY

Tue, Jan 12, 2021 | 11:00 AM - 12:00 PM ET

WATCH RECORDING

LEVELING THE SLOPE:
HELPING STATE AND LOCAL GOVERNMENTS REACH THEIR ENERGY GOALS

Tue, Mar 16, 2021 | 3:00 - 4:00 PM ET

WASTEWATER TREATMENT 2.0:
THE NEXT PHASE OF ENERGY EFFICIENCY AND RECOVERY

Tue, Oct 20, 2020 | 3:00 - 4:00 PM ET

WATCH RECORDING

ONE SIZE DOES NOT FIT ALL:
LESSONS LEARNED FROM FINANCING LARGE AND SMALL ENERGY RETROFITS

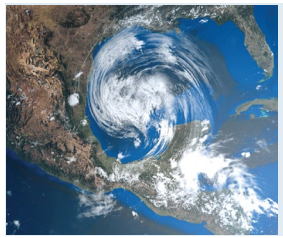
Tue, Jan 19, 2021 | 3:00 - 4:00 PM ET

WATCH RECORDING

YOU HAVE A DATA CENTER – NOW WHAT?
STORIES FROM THE FIELD

Tue, Apr 6, 2021 | 3:00 - 4:00 PM ET

REGISTER TODAY



PLANNING FOR RESILIENCE IN MULTIFAMILY HOUSING:
A PORTFOLIO-WIDE APPROACH

Tue, Nov 17, 2020 | 3:00 - 4:15 PM ET

WATCH RECORDING

CLIMATE RISK ASSESSMENTS:
EVALUATING BUILDING SITES FOR PORTFOLIO RESILIENCE

Tue, Feb 2, 2021 | 3:00 - 4:00 PM ET

WATCH RECORDING

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2020-2021 Better Buildings Webinar Series

YOU HAVE A DATA CENTER – NOW WHAT?

STORIES FROM THE FIELD

Tue, Apr 6, 2021 | 3:00 - 4:00 PM ET

REGISTER TODAY

Gain insight into energy efficiency from organizations that have prioritized their data centers as an opportunity for savings. As organizations increasingly rely on data centers as mission critical operations, energy efficiency offers opportunities to make meaningful reductions in overall operating costs. These opportunities, experiences implementing projects, and lessons learned may vary across different data center types, whether they be small, co-location, or enterprise. In this webinar, attendees will hear from Better Buildings partners about their experiences implementing energy efficiency projects within each of these data center types. Learn how you can leverage energy efficiency to streamline operations, cut operating costs, and increase data center resiliency.

Learn more at: https://betterbuildingssolutioncenter.energy.gov/workforce

ON-DEMAND BETTER BUILDINGS WEBINARS

Through Better Buildings webinars, experts discuss a variety of topics from Air Management to Zero Energy. These webinars are helpful resources on key subject areas in energy efficiency, water efficiency, resilience, and more. Below are webinars we have held over previous years. For each webinar, you can watch the video recording and follow along with the slide deck. To sign up for an upcoming live webinar, click here.

EXPLORE BY TOPIC

Building Envelope | Communications & Engagement | Data Centers | Energy Data Management | Financing | Green Leasing | Health & Wellness | Industrial | K-12 Schools | Lighting | Multifamily | Plug & Process Loads | Refrigeration | Renewables Integration | Resilience | Smart Labs | Space Conditioning | Treasure Hunts | Waste Reduction | Water & Wastewater | Workforce Development | Working with National Labs | Zero Energy Buildings

Indicates the session was a part of the 2020 Virtual Summit. To view a full list of the Summit Sessions, click here.

BUILDING ENVELOPE

A building's envelope (walls, windows, roof, and foundation) accounts for approximately 30% of the primary energy consumed in residential and commercial buildings. Explore all previously recorded webinars on this topic by pressing MORE.

- Unsealed: The Building Envelope Campaign (2020)
- Sneak Peek of the Building Envelope Campaign (2020)
- Addressing the Envelope: Recognizing Building Enclosure Improvements (2020)
- Innovative Wall Technologies for Commercial Buildings (2019)
- Energy Savings Impact of Airtightness in U.S. Commercial Buildings (2019)
- Building Envelope/Enclosure Commissioning and Retro-commissioning (2017)

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- Watch recordings
- Follow along with slides

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