When Progress Flows: Water Reduction, Reuse and Creative Solutions

Wednesday, May 19th, 2021
11:00am-12:30pm ET
Hannah Debelius
ORISE Fellow, Department of Energy
Agenda

1. Introduction
2. Jaime Gonzalez-Brana: Water Savings Strategies at Owens Corning
4. Ken Rosenfeld: BOMA W² Challenge
5. Q&A Session
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#DOE
The Better Buildings Water Savings Initiative

● What is it?
  ○ The Better Buildings Water Savings Initiative is a complementary program to the Energy Savings Initiative in which Better Buildings partners can commit to decreasing their water usage by 20% over the course of 10 years

● What does the program offer?
  ○ Technical Assistance & Data Evaluation
  ○ Recognition
  ○ **Proven Solutions and Resources** including guidance on:
    ■ Developing a water management plan
    ■ Implementing appropriate monitoring and tracking practices
    ■ Identifying water-efficient technologies or appliances
Water Savings Initiative – 2020 Goal Achiever!

University of Nebraska Medical Center

- 23% Water Use Intensity Reduction across 7 million sq. ft. portfolio
- Solutions
  - Employee Engagement Program
  - Improved cooling tower efficiency
  - Replaced non-recirculating cooling systems on freezers, MRI machines and electron microscopes
Previous Goal Achievers

2016
- Cummins, Inc.
- UTC
- Poudre School District
- Atlanta, GA

2017
- Staples
- General Motors

2018
- Shari’s Cafe and Pies
- Anthem

2019
- Keene Housing
- Tenderloin Neighborhood Development Corporation
Today’s Presenters

Jaime Gonzalez-Braña
Owens-Corning

Joan Kowal
Emory University

Ken Rosenfeld
Building Owners and Managers Association (BOMA)
Jaime Gonzalez-Brana
Owens Corning

Submit Questions
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WHEN PROGRESS FLOWS: WATER REDUCTION, REUSE, AND CREATIVE SOLUTIONS

OWENS CORNING

JAIME GONZALEZ BRANA

MAY 19, 2021
OWENS CORNING AT A GLANCE

$7.1 BILLION IN SALES
2020 REVENUE

19,000 EMPLOYEES

33 COUNTRIES WHERE WE OPERATE

66 CONSECUTIVE YEARS AS A FORTUNE® 500 COMPANY

Serving residential, commercial, and industrial markets

INSULATION | ROOFING | COMPOSITES
OWENS CORNING INNOVATION IS ALL AROUND US

How We Move  Where We Live  What We Do  How We Power Our Lives

And More!
WHAT SUSTAINABILITY MEANS TO US

NET-POSITIVE COMPANY ASPIRATION

“Meeting the needs of the present while leaving the world a better place for the future.”
We consider the future in everything we do.

**Safety, Health, Community**
- Injuries reduced by over 90% since our baseline year of 2002.

**Operations**
- Owens Corning was among the first companies to set holistic footprint reduction goals.

**Product and Supply Chain**
- Our sustainable product strategy includes being leaders in transparency.

**Innovation and Collaboration**
- We work with customers to improve energy efficiency and durability of their products.

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REDUCING OUR ENVIRONMENTAL FOOTPRINT
CUT THE NEGATIVE IMPACT OF OUR OPERATIONS IN HALF

- Reduce greenhouse gas emissions from our operations by half, in line with what’s needed to limit global warming to 1.5°C.

- Switch to 100% renewable electricity. Purchase electricity only from renewable sources.

- Cut in half the amount we take from the local water supply in places where scientific methods indicate water is limited in quantity and/or quality.

- Send zero waste to landfill by cutting in half the amount of waste we generate and recycling the rest.

- Develop biodiversity goals by 2025.

Cut our emissions of volatile organic compounds and fine particulate matter in half.

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2010-2020 PROGRESS ON 2020 SUSTAINABILITY GOALS
SHRINKING OUR ENVIRONMENTAL FOOTPRINT...SETTING AND ACHIEVING AMBITIOUS GOALS

- PRIMARY ENERGY
  - 2020 Goal: -20
  - Original Goal: -29
  - 2010-2020: -29
  - Current: -20

- GREENHOUSE GAS
  - 2020 Goal: -50
  - Original Goal: -53
  - 2010-2020: -53
  - Current: -50

- PARTICULATE MATTER 2.5
  - 2020 Goal: -15
  - Original Goal: -39
  - 2010-2020: -39
  - Current: -15

- TOXIC AIR EMISSIONS
  - 2020 Goal: -50
  - Original Goal: -56
  - 2010-2020: -56
  - Current: -50

- WASTE TO LANDFILL
  - 2020 Goal: -27
  - Original Goal: -70
  - 2010-2020: -70
  - Current: -27

- WATER
  - 2020 Goal: -35
  - Original Goal: -43
  - 2010-2020: -43
  - Current: -35
By 2030, we aim to cut in half the amount we take from local water supplies in places where water is limited in quantity or quality. In addition, we intend to ensure that our other facilities remain at the same water intensity as our base year of 2018, or lower when aggregated.

50% aggregate intensity reduction of water withdrawal in high water-stress sites from 2018 baseline.

Remain flat or reduce aggregate water withdrawal intensity at all remaining sites from 2018 baseline.

Compared to 2018, continued water use efficiencies and fixture upgrades and repairs led to a 10% reduction in intensity at our high water-stress sites, and a 12% reduction in intensity at our remaining sites.
COMMITTED TO SOURCING AND USING WATER WISELY

OWENS CORNING’S STRATEGY AND APPROACH

- Using a sustainability mapping tool during the development of new and significantly modified products
- Performing life cycle assessments and product stewardship reviews of our products
- Increasing Water Efficiency
- Recirculating Water
- Recycling Water
WHERE DOES THE WASTE WATER COME FROM?
WASTE WATER TREATMENT SYSTEM

- The installation of this wastewater treatment system is reducing water consumption by more than 100,000 m³/year and $500k/year in savings.

- The reject water in this process irrigates the company fields, while the residual water goes back to the cooling towers.
The opportunity of harvesting rainwater to capture, divert and store rainwater was identified to provide a source of alternative water.

For this project, a rainwater harvesting system was installed in one of our facilities.

The average water consumption reduction for the facility is 17,500 m³/year, representing a $37k savings per year.
DIGGING START

TANK / PIPES INTEGRATION

POLYPROPYLENE GEOMEMBRANE INSTALLATION

TIGHTNESS TEST

FENCE CLOSURE

PUMPS AND LUMINARIES INSTALLATION

TANK CAPACITY: 1,500 M³
WATER SAVINGS KAIZEN COST OPPORTUNITY

Background:
Water is used to push waste glass fibers to the shredder at the basement level for each 1st position of forehearth. During a Kaizen event at the plant, it was assessed this water is used continually with too much flow.
1st step: reduce flow manually
2nd step: open the water valve to push glass fibers only during a breakout

Savings:
Monthly water consumption is reduced by 90%
Annual savings: ~$150k
TESTING NEW TECHNOLOGIES

CREATIVE AND INNOVATIVE SOLUTIONS

- One of our largest users of water is testing a new water recycling technology. This site is located in an area where the lack of water is starting to affect the population and industry.

- The process is based in electrochemical principles to clean the water.

- This new technology could reduce up to 47% of water consumption and decrease 95% of water treatment costs.

- This goes along with our long-term strategy to use these systems and process improvements as models for future installations across our operations.

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DOE WATER INPLT TRAINING

• Owens Corning was part of the DOE’s pilot program for the Water INPLT
• This was a 2.5-day activity that trained facility personnel on water efficiency

Objectives of Training
• Conduct plant water balance
• Quantify true cost of water
• Find water and associated cost savings opportunities

Opportunities Identified
• Leak correction
• Lower Spray Pad Level/Remove End Spray Nozzles
• Dehumidifier Management
• Chiller Controls Upgrades

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Water Reclamation at Emory: The WaterHub®

Photo credit: Sustainable Water
Emory University Overview

• LOCATED NEAR ATLANTA, GA
• 14,724 STUDENTS
• 29,338 EMPLOYEES
• APPROXIMATELY 9 MILLION SQUARE FEET; 130 BUILDINGS
• $628M IN RESEARCH FUNDING
The WaterHub
Water Stewardship to Address Global & Local Water Challenges

Global Concerns
- Rising demand
- Water-Energy Nexus
- Limited supply
- Climate change
- Inequitable access

Local Concerns
- Aging infrastructure
- Drought prone
- Largest municipality on smallest watershed
- Tri-state water wars
Aging Infrastructure

Estimated $4 billion in infrastructure needs

CSO & Stormwater Management

Sewer Main Rehab, Atlanta

Custer Avenue CSO Improvement, Atlanta

The cost of infrastructure is passed on to the consumer
Total Water Use at Emory – FY19

361 MILLION
GALLONS PER YEAR

60% DOMESTIC / POTABLE USES

37% HVAC / COOLING MAKEUP

68M gallons Reclaimed Water Production used to displace non-potable demands

3% IRRIGATION

Bulk Water Reuse – The Impactful Solution
Emory’s Evolution of Water Conservation

LEVEL OF SOPHISTICATION & IMPACT

SIMPLE SOLUTIONS
- STICKERS
- LOW FLOW FIXTURES

BUILDING-BASED SOLUTIONS
- RAIN BARRELS
- STORMWATER REUSE

CAMPUS-WIDE SOLUTIONS
- RECLAMATION & REUSE

The Most Impactful Solution That Does Not Require Behavioral Change
The Water Hub: Water Reclamation Facility

• Up to 400,000 gallons/day; over 140 million gal/year (40% total water used)
• Reuse to heat and cool campus buildings and toilet flushing
• Biomimetic technology– 1st in U.S.
• Estimated Millions in Cost Savings once Utility recognizes sewer credit
The Water Hub: Design Considerations

- **LOCATION**
  - ON-SITE VS OFF-SITE
  - SANITARY SEWER LOCATIONS
  - SEASONAL SEWER VOLUMES
  - CONTENT OF SANITARY SEWER – MORE INDUSTRIAL THAN RESIDENTIAL

- **SIZE**
  - SEASONALITY OF UTILITY WATER MAKE-UP
    - SIZE FOR BASE LOAD OR PEAK CAPACITY
    - STORAGE CAPACITY; BACK UP STORAGE FACILITY
    - DISTRIBUTION PIPING

- **WATER QUALITY**
  - TREATMENT AT FACILITY OR LOCALLY AT COOLING TOWERS AND STEAM PLANT
  - KEEP IT SIMILAR TO POTABLE WATER OR OVERHAUL WATER TREATMENT PLAN

- **NON-UTILITY CONSIDERATIONS:**
  - SUSTAINABILITY VALUE
  - EDUCATIONAL VALUE
  - AESTHETICS
Georgia/County Requirements

• EXISTING
  • GEORGIA GUIDELINES FOR RECLAIMED WATER SYSTEMS FOR BUILDINGS
  • GA EPD GUIDELINES FOR WATER RECLAMATION AND URBAN WATER REUSE

• NON-EXISTING
  • METHOD FOR OBTAINING A SEWER CREDIT FROM DEKALB WATERSHED
  • CLARITY REGARDING INDUSTRIAL DISCHARGE PERMIT
Contracting/Financing

- WATER PURCHASE AGREEMENT (WPA)
  - LAND LEASE
  - THIRD PARTY OWNS AND OPERATES
  - NO UP-FRONT CAPITAL
  - PRICE STRUCTURE CAN HEDGE UNPREDICTABLE WATER ESCALATION RATES
  - WATER QUALITY REQUIREMENTS
  - AVAILABILITY
Risks Associated With WPA

• THIRD PARTY OWNS AND OPERATES; MANAGEABLE WITH GOOD RELATIONSHIP AND CONTRACT TERMS

• PRICE STRUCTURE MAY NOT RESULT IN GUARANTEED SAVINGS;
  • FIXED PRICE + ESCALATION VS INDEXED RATE
  • VALUE OF SEWER CREDIT

• WATER QUALITY REQUIREMENTS – NEED TO MAINTAIN A BACK-UP WATER SUPPLY; CHEMICAL TREATMENT ADJUSTMENTS

• IF ON YOUR SITE, MAY REQUIRE LAND-OWNER HOLD PERMITS

• AVAILABILITY; SAVINGS CALCULATIONS SHOULD NOT USE OVERLY AGGRESSIVE VOLUMES
Operations/Lessons Learned

• INITIAL REDUCTION IN CYCLES OF CONCENTRATION; HAVE WORKED BACK UP TO 8

• INCREASED CHEMICAL COSTS BUT NOT PROHIBITIVE

• BLENDING OF MAKE UP WATER AT STEAM PLANT INITIALLY; NEED TO ADD REVERSE OSMOSIS GOING FORWARD

• REDIRECT SOME WASTE THAT USED TO END UP IN THE SANITARY SEWER – ANIMAL BEDDING

• REVISIT BY DEKALB OF SEWER CREDIT; SHOULD HAVE HAD A FORMAL AGREEMENT IN PLACE PRIOR TO CONSTRUCTION
The WaterHub is integrated directly into core classwork:

- Allows students to have hands-on training in testing the treated water
- Enables research of treated water quality related to pathogens

The WaterHub provides research & teaching opportunities in areas such as:
- Performance Landscaping
- Urban Planning
- Water Quality
- Health Implications
- Sanitary Standards
- Environmental Justice
- Social Equity
- Environmental Sciences Biology
- Health Sciences
- Contaminant Removal Microbial
- Ecology

"The WaterHub provides the experience of collecting real data, interpreting results and writing reports. For some students, it may have been the first hands-on lab experience that they’ve had."

Christine Moe, Director of the Center for Global Safe Water, Emory University
Ken Rosenfeld
BOMA

Submit Questions
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W² Challenge
Taking Sustainability to the Next Level

Ken Rosenfeld
Director of State and Local Affairs

Better Buildings Summit
May 2021
BOMA W² Challenge

Origins

Water and waste are the next frontier of sustainability efforts in property management
BOMA W² Challenge

Origins

Water and waste are the next frontier of sustainability efforts in property management

You can’t manage what you don’t measure
BOMA W² Challenge
BOMA W² Challenge

Program Summary

• Two-year water and waste challenge:
  - benchmark consumption/costs (2018)
  - implement best practices (2019)
• Utilized ENERGY STAR® Portfolio Manager® for quarterly reporting
• Participants received progress reports, technical assistance and industry solutions
• BOMA produced reports and other materials using aggregate data and success stories
• Participation was open to anyone and all building sectors were welcome
BOMA W² Challenge

Benefits to the Industry

• Advance the next generation of industry sustainability efforts
• Provide convenient tool for tracking water and waste
• Quantify the impact of voluntary benchmarking
• Identify challenges and potential policy solutions
BOMA W² Challenge

Benefits to Participants

• Better understand water and waste usage
• Receive progress reports
• Compare performance to peers
• Reduce operating costs
• Receive guidance on best practices including monthly emails and regular webinars
• Expand sustainability efforts
• Earn recognition for your leadership
BOMA W² Challenge

Participation

1,919 Buildings Participating
412 Cities Represented
493M+ Square Feet Shared
BOMA W² Challenge

Improvement Guides
BOMA W² Challenge

Improvement Guides
BOMA W² Challenge

Participant Progress Reporting
Comparing Q3 2018 to Q3 2019, Challenge participants:

- saved **1.675 million gallons** of water
- diverted **216 tons** of waste
BOMA W² Challenge

20 E. Thomas
Phoenix, AZ

Upgrading faucet aerators produced 37% reduction in building water use
(LBA Realty)
BOMA W² Challenge

Champions

WATER PERFORMANCE IMPROVEMENT
LARGE PORTFOLIO

1. Shorenstein (56%)
2. UBS
3. Principal Real Estate Investors

WATER PERFORMANCE IMPROVEMENT
SMALL PORTFOLIO

1. Americas Capital Partners (20%)
2. Unico
3. (tie) AGLO Burbank / Kilroy Realty
BOMA W² Challenge

Stories from the Challenge

Ballantyne Corporate Park
Charlotte, NC
(Northwood Office)

The Residences at La Cantera
San Antonio, TX
(USAA Real Estate)
BOMA International

100 Associations That Will Save the World
W² Challenge
Taking Sustainability to the Next Level

Ken Rosenfeld
Director of State and Local Affairs

krosenfeld@boma.org
www.boma.org
Q & A

Submit Questions
www.slido.com event code #DOE
Additional Resources

Be sure to check out some of these new and interesting resources on the Better Buildings Solution Center for industrial, commercial, multifamily and public sector buildings looking to support their water reduction goals, including:

• Water System Info Card - [Link]
• Plant Water Profiler Tool - [Link]
• Water Efficiency In-plant Training - [Link]
• Developing a Corporate Water Management Strategy for Manufacturers Primer - [Link]
• New Better Plants Case Studies and Presentations - [Link]
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Additional Questions?

Please Contact Us

Jaime Gonzalez-Braña
Owens-Corning
Jaime.gonzalezbrana@owenscorning.com

Joan Kowal
Emory University
Joan.Kowal@emory.edu

Ken Rosenfeld
Building Owners and Managers Association
krosenfeld@boma.org

Hannah Debelius
Department of Energy
Hannah.Debelius@ee.doe.gov

Follow us on Twitter
@BetterBldgsDOE

Better Buildings Solution Center
https://betterbuildingssolutioncenter.energy.gov/

General Inquiries
BetterBuildings@retechadvisors.com

Program Support
ksanderson@retechadvisors.com