

# MUSC Sustainability and Resilience

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# MUSC Sustainability and Resilience



Dec 2023 nor'easter – Record rainfall 3.6" just 2 days ago

**“We cannot solve our problems with the same thinking we used when we created them.”**  
– Albert Einstein, Physicist

# MUSC Sustainability and Resilience

Sustainability should be baked into everything we do, every day.

- Strategic Energy Management
  - Energy Team
  - Energy Policy
  - Energy Plan
  - Performance and Tracking
  - Engagement
- Resilience



# Strategic Energy Management

- Energy Team
  - E & F
  - Communications
  - Finance
  - Students
  - Training
    - Energy policy
    - Energy management assessments
  - Team calls
  - Milestone calls





# Strategic Energy Management

- Energy Policy
  - SEM provides tools and guidance to help
  - Policy includes:
    - Sustainable Building and Design
    - Energy Efficiency and Conservation
    - Renewable Energy Integration
    - Research and Innovation
    - Monitoring and Reporting
    - Education and Outreach
    - Goals
    - Reference to SC State Energy Act
  - Energy Plan – more to come
  - Opportunity Hunt / Performance and Tracking – more to come



# Strategic Energy Management

- Engagement

**Energy Consumption Reduction Tip #1:**  
Shut down your computer after use







## Energy Action Month October



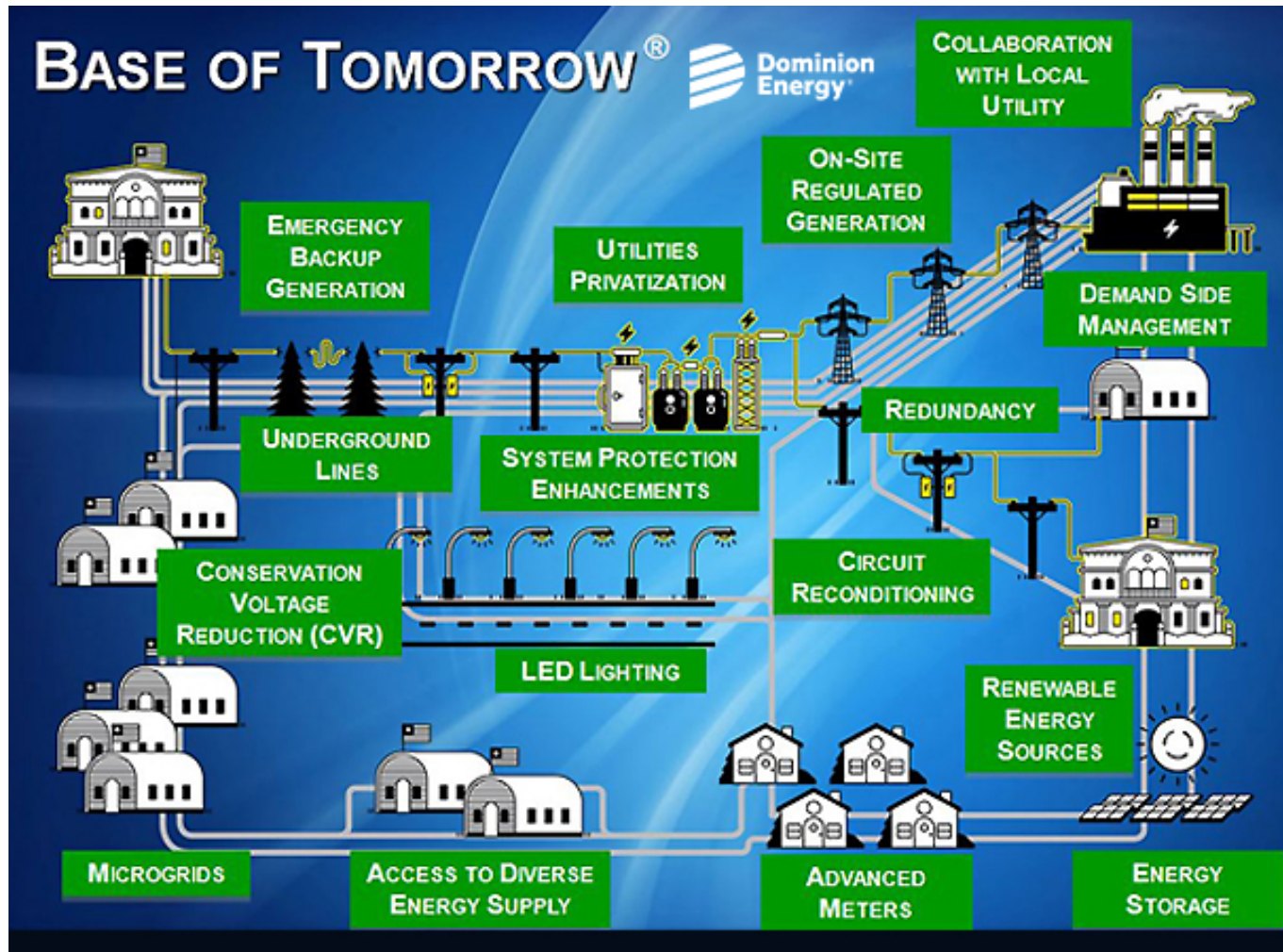
In October we celebrate leadership in energy management and building optimization, energy resilience and security, and the use of advanced and distributed energy technologies.

## Summer Energy Tips



-  **TURN OFF COMPUTERS, PRINTERS, MONITORS, AND OTHER DEVICES OVERNIGHT AND ON WEEKENDS**
-  **TURN OFF THE LIGHTS WHEN NOT IN USE**
-  **DURING THE SUMMER MONTHS, SET YOUR THERMOSTAT TO A NORMAL 74° F**
-  **UNPLUG APPLIANCES WHEN NOT IN USE TO AVOID PHANTOM ENERGY CONSUMPTION**

# Resilience



- Resilience
  - Reduce demand
  - Diversify energy sources
  - Utilize microgrids and distributed energy
  - Store energy
  - Maintain backup power systems
  - Use redundant and hardened infrastructure
  - Create emergency preparedness plans
  - Engagement
  - Monitor and evaluate / Energy Management Software Demo



# Resilience – Reduce Demand/Green Building



## LEED Gold 2011

- 21.5% energy cost savings
- Occupancy sensors, lighting controls, and task lighting
- R20 wall & roof insulation
- Exterior lighting (savings of 36.1%)
- Highly efficient HVAC system with heat recovery



## LEED Silver 2020

- 18% energy cost savings
- 15' above MSL
- Partial green roof
- Low-E glass and double pane windows
- Irrigation from condensate return
- 75% of C & D waste recycled
- 35% water use reduction

# Resilience – Reduce Demand/Green Building



## Two Green Globes 2022

- **Scored 61.2% on energy**
- BAS and lighting controls, task lighting
- 38% of C & D waste recycled



## Two Green Globes 2023

- **10% energy cost savings**
- Use of central energy plant, automatic light controls
- 55,000-gal H<sub>2</sub>O collected from a 7yr design storm
- Bird collision mitigation in place
- **30% water consumption savings**
- **90% on emissions**

# Resilience – Reduce Demand/Green Building



## Two Green Globes 2023

- Use of central energy plant, occupancy sensors, lighting controls, auto shutoff and task lighting
- Central BAS
- Significant portions of interior elements were reused and recycling available
- **100% on emissions**

**“An endless number of green buildings doesn’t make a sustainable city.”**

— Jan Gehl

- Purchase high efficiency equipment
- Use energy efficiently
  - Optimize settings
  - Maintain equipment (PM’s)
  - Recommissioning



# Resilience – Reduce Demand Performance Contract



## 2009 Performance Contract Overall Energy and Water Savings of \$2.5 M/Yr

- Changed out ~ 49,000 lights
- 1815 new low flush toilets
- 211 Urinals
- 2571 Flow Restrictors

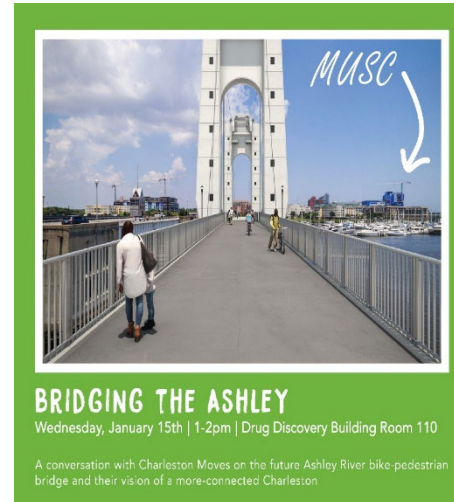


## 2020 Performance Contract Overall Energy and Water Savings of \$2.9 M/Yr

- Lighting upgrades to LED
- AHU condensate recovery
- Chiller plant optimization
- Optimize building automation system

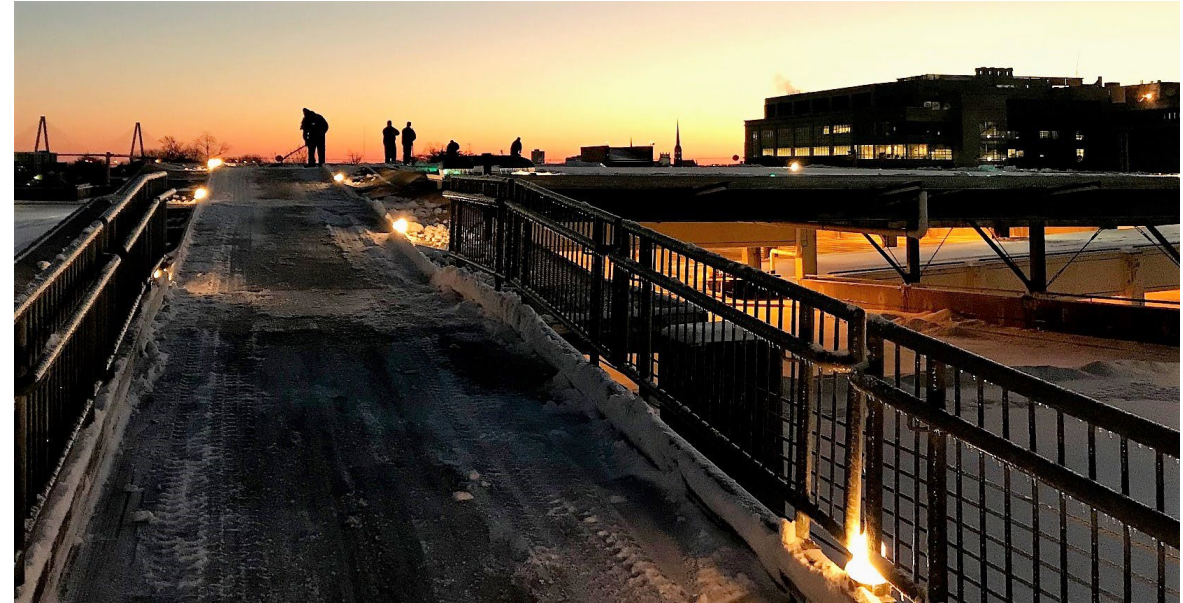
# Resilience – Reduce Demand Transportation

- LIME Electric Bikes
- Telemedicine
- Telework policy
- CARTA Bus Service
  - EXPRESS bus
  - LCRT coming by 2029
    - Dedicated lane with stop light priority from Summerville to Charleston
    - Electric buses every 10-minutes peak service
- Carpooling
- Occasional Parker- \$5 day pass
- **WHAT'S NEXT– EV Chargers**



# Resilience – System Protection

- Grounds
  - Battery powered equipment/charge up and extra batteries
  - Fuel all vehicles and equipment and elevate
  - 50 gallons diesel
  - 60 gallons gas
  - Propane tanks
  - Oil
  - Manage **tree trimming** for electric lines





# Resilience - Back-up Power

- Generators
  - All sized larger than need
  - Test monthly 30 mins load & tri-annually (every 36 mos) 4hr load
- Fuel tanks
  - Clean & check seals annually (contract)
  - Clean & check seals after every hurricane (contract)
  - Clean & check seals after nuisance flooding (in-house)
  - Veeder Root tank detection systems (FRC)
- Type of equipment on e-power
  - Critical care equipment
  - Lighting for egress & patient rooms
  - Data center 100%
  - Acute care & ICU's
  - Operating and procedure rooms
  - Pathology and research labs
  - Waste compactor



# Resilience - Back-up Power

- **Boiler Shop Staff**
  - Check fuel oil level in all boiler tanks; fill, if necessary
  - Cover all floor drains and manholes in boiler room
  - Check emergency sump pumps in pit for flooding
  - Put back up boilers in hot standby
  - Secure roll-up door and sandbag
  - Secure boilers in outlying buildings
  
- **UPS backup for all critical systems**
  - Data centers
    - Back-up data to the cloud
  - Building Automation System
  - Individual computers
  - Research related equipment not already on e-power
  - At department discretion



# Resilience - Back-up your Back-up

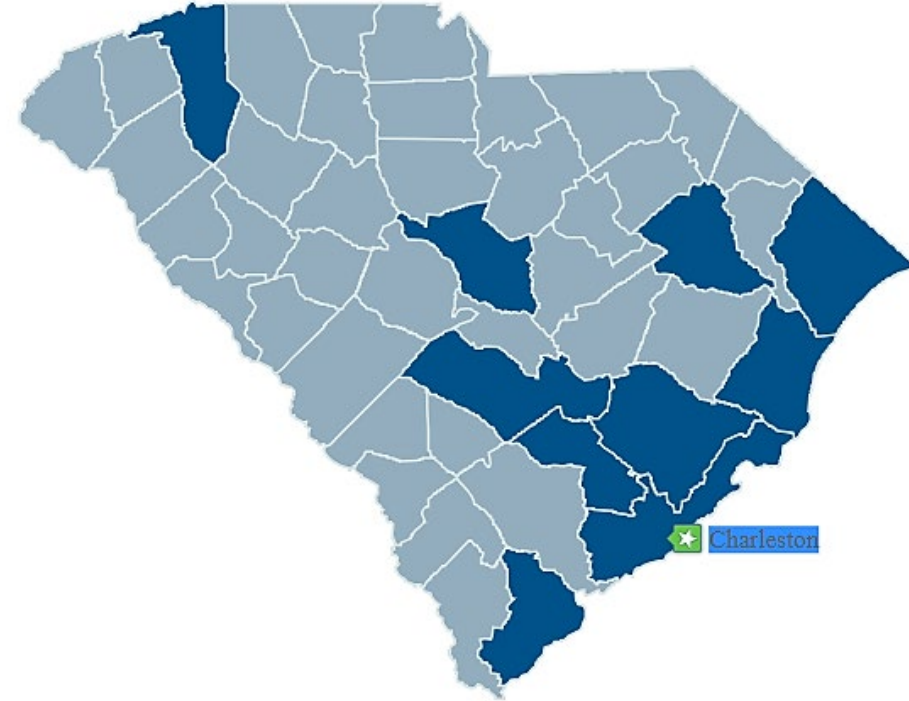
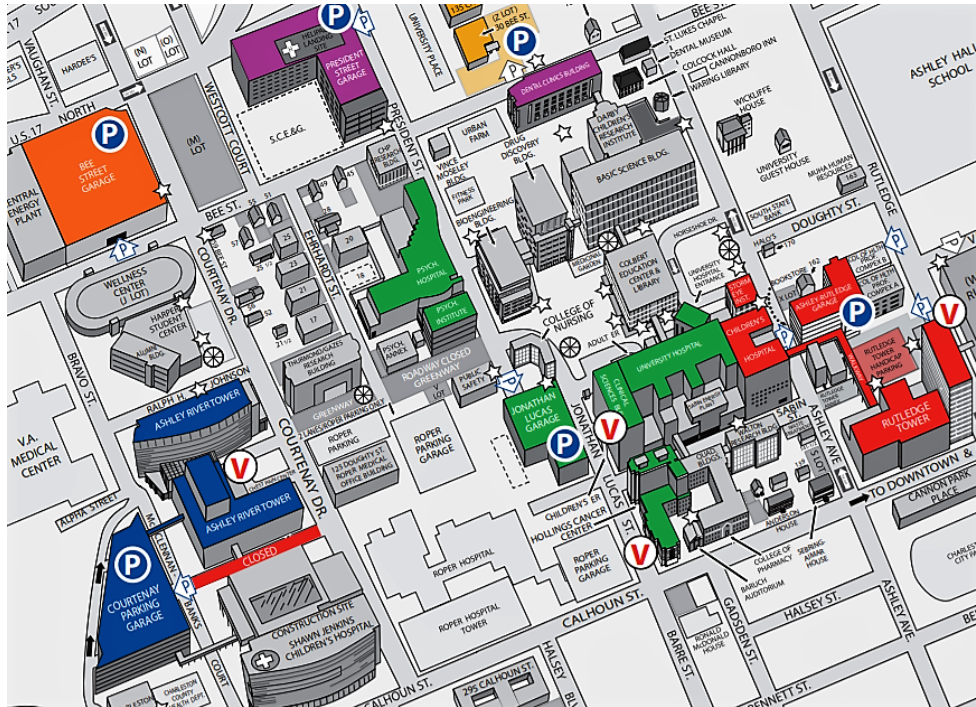
- Emergency Supplies
  - In ground fuel tanks 4-day supply (96 hrs for seismic zone 3A)
  - Two Fuel tankers 13,000-gal total, 3-day supply
  - Fuel companies on standby
  - Within 20 miles of fuel farm
  - 2 back-up generators
  - Fuel up all vehicles and equipment and elevate or evacuate
  - Extra cords
  - Flashlights
  - Batteries
  - Keys (takes place of electronic locks on doors and equipment)





# Emergency Preparedness

Mitigate – Infrastructure Expansion Outside of High Hazard Areas




Florence, Chester, Marion, Lancaster,  
Orangeburg, Columbia

# Emergency Preparedness

## Engagement– Public Information Programs, Warning Systems

MUSC Emergency Cell Phone Text Alerts

**Don't be the last to know...**



It's now easy to get MUSC Emergency Text Alerts on your phone for communication during a crisis

With RAVE Alerts SMS Text opt in features, you can now get MUSC Emergency Text Alerts on your phone while you are working or studying on the MUSC Campus. When you are no longer on the MUSC Campus, you can text stop to have your alert notification list.

Just Text MUSAlert to 226787 to begin receiving

When you wish to be removed from receiving the text alerts, just text stop and you will be removed from the list.

843-792-5852  
Muscedu/publicsafety

Hurricane Awareness Smart Phone Apps

Download the South Carolina Emergency Manager App for free to get information on school closings, road closures and all the tools that you and your family needs to prepare.



The South Carolina Emergency Manager  
Your personal emergency manager has arrived.

CodeRED™ Keeping citizens informed.  
The Red Cross is the national leader in emergency preparedness, disaster relief and disaster recovery.

COMMUNITY NOTIFICATION ENROLLMENT

South Carolina Emergency Management Division, SC

Red Cross Emergency App

Download the Red Cross Emergency App for Evacuation shelter info

best tool that you can use with your family for a storm

MUSC MEDICAL UNIVERSITY OF SOUTH CAROLINA

### WHAT TO BRING To an Evacuation Shelter

You should pre-assemble supplies you might need in an evacuation. Bring at least a 72-hours supply of all medication, dietary supplements, medical supplies and personal items. Store them in an easy to carry backpack.

- Suggested items include:
- Extra clothing
  - Bottled Water
  - Pillows and blankets
  - Canned food
  - Hygiene supplies
  - Toothbrush and tooth paste
  - Flashlight and batteries
  - Identification
  - Books
  - Insurance and important paperwork
  - Basic snacks
  - First aid kit
  - Portable chair
  - Garbage bags

Red Cross Emergency App

Help in your hands. Get news updates and emergency alerts, along with the tools you need to do more.

Free download.

Download the Red Cross Emergency App for more information

Take your cell phone charger and a battery pack device. Use texting to communicate.

Student Programs and Student Diversity  
Harper Student Center, Suite 215  
Muscedu/spsd


University Emergency Management  
101 Daughtry Street  
(843) 792-5852  
Muscedu/publicsafety

MUSC MEDICAL UNIVERSITY OF SOUTH CAROLINA

MUSC Weather Alert Tip Sheet

Always have different ways to get informed during an emergency.

Always know where to go for information when a hurricane is approaching Charleston



MUSC Information Line: 843-792-MUSC (6872). This phone line is always updated with important, general emergency information  
Audience: MUSC University/MUSC Health and MUSC-P/Students

MUSC Alerts: Texts and e-mails. You must sign up to receive text alerts. Log into your MUSC Alert account and update your information to include a cellular phone number and non-MUSC e-mail accounts.  
Audience: All MUSC Employees and Students

Yammer Weather Updates: Add the free Yammer app to your mobile phone for easy access and real-time updates.  
Audience: MUSC University/MUSC Health and MUSC-P/Students

In addition to the channels listed above, the Office of Communications and Marketing sends updates to every MUSC E-Mail address in times of emergencies at regular intervals.

# Reduce, Reuse, Recycle, Compost

- Reduce toxicity
- Recycle oil, LED lights, electronics, batteries, paint, spray cans, plastic containers and scrap metal
- Capture & recycle CFC's
- Compost grounds waste



Fluorescent, HID and Neon Bulbs & Ballasts



All Batteries



Chemicals & Cleaners



Oil-Soaked Rags



Pesticides



Spray Cans



Paint



Thinners and Solvents



Automotive fluids



Oil Filters



# Energy Management Software



# Thank You

