• Charlotte City Council Resolution
• Charlotte Strategic Energy Action Plan
• Bloomberg American Cities Climate Challenge
• Discussion
Mayors Clodfelter, Roberts, & Lyles signed Global Covenant of Mayors for Climate & Energy commitment (GCoM).

Goal: reduction of greenhouse gas emissions from municipal operations and communities to meet goals of the Paris Climate Agreement.
We currently emit about 12 tons of CO₂ equivalent per person annually according to the 2015 baseline.

Read the full SEAP at charlottenc.gov/sustainability/seap
“Sustainable and Resilient Charlotte by 2050” Resolution

1) By 2030, strive to source 100% of City’s energy use in its buildings and fleet from zero carbon sources.

2) By 2050, strive to become a low carbon city (average 2 tons CO$_2$e/person).

3) Develop an action plan as a framework to achieve goals.

Passed by City Council June, 2018
Strategic Energy Action Plan: Duel-Phase Approach

• Community SEAP

• Internal operational efforts toward the 2030 goals will be an appendix to the SEAP, to be updated regularly.
Strategic Energy Action Plan
Stakeholder Involvement and Feedback Received

General Themes:
• Timeline
• Natural Gas
• Equity & Inclusion
• Duke Energy
• Regulatory Changes
• 11 Linked Action Areas with focus or
  1. Buildings
  2. Energy Generation
  3. Transportation
  4. Workforce Development/Equity

• Foundation of innovation, equity, inclusion, and workforce development.

• 5 Stages to Zero Carbon Energy
Internal/Organizational Action Areas

Action Area 1: Structural Change
Action Area 2: Initiate Citywide Communication Toward A Low Carbon Future
Action Area 3: Develop Smart Data Approaches
Action Area 4: Develop And Implement Resilient Innovation Districts (RIDS)
Action Area 5*: Strive Toward 100% Zero Carbon Municipal Buildings By 2030
Action Area 6*: Strive Toward 100% Zero Carbon City Fleet By 2030

Community Action Areas

Action Area 7: Near Zero Carbon Non-municipal Buildings By 2050
Action Area 8: Facilitate Rapid Uptake Of Sustainable Modes Of Transportation
Action Area 9: Develop And Implement Strategy For Deploying Low Carbon Infrastructure Generation
Action Area 10: Develop Green Workforce Pipeline In Support Of Energy Transition
Action Area 11: Establish Public-Private-Plus Partnerships To Accelerate Transition To A Low Carbon Future
Five stages to zero carbon energy

1. Shift Energy Demand
   Gaining control of when energy is consumed (energy demand) is a crucial step in gaining control of your energy use. With better control of energy demand opportunities for zero carbon energy increase.

2. Purchase the Remainder
   Any zero carbon energy that cannot be produced onsite will need to be procured. Negotiating energy contracts is not a straightforward process. It is made easier and cheaper with better knowledge of your energy usage. The other steps will help in this process.

3. Generate Energy On-Site
   The energy needs may be met entirely or partially onsite. This generation may be for heat (e.g., solar thermal, heat pump or CHP), cooling (using an absorption chiller) and/or electricity (e.g., solar PV, wind, CHP).

4. Reduce Energy Consumption
   Reducing the amount of energy consumed means there is less zero carbon energy that must be procured. When considered as part of a package of energy reduction options, reducing energy consumption offers revenue potential that can be used to finance wider energy investment.

5. Change the Energy Consumed
   This stage requires changing the type of energy consumed. This means moving from fossil fuels to zero carbon energy. This may be bioenergy or electricity / hydrogens. If electricity it does not need to be zero carbon, yet.
Pathways to Success in 2030

The Pathways include:
• One asset at a time (retrofit each facility, replace/retrofit each vehicle, install each charging station)
• Change behaviors
• Large-scale solutions such as large solar fields
• “Purchase” only low/zero carbon electricity sources – AS A LAST RESORT

The Variables include:
• Changing Duke Energy mix
• Technology advances and opportunities

The Funding Approaches include:
• Revolving Fund utilizing energy savings
• CIP/Enterprise Funds/Tourism Fund
• P3 Opportunities
• Grants
• Performance Contracts
American Cities Climate Challenge
In December of 2018, Charlotte was chosen as one of the 25 cities to receive the American Cities Climate Challenge.

The **American Cities Climate Challenge** is a Bloomberg Philanthropies initiative that aims to accelerate and deepen U.S. cities’ efforts to create the **greatest climate impact through 2020** and showcase the benefits – **good jobs, cleaner air, and cost savings** – that climate solutions brings.
– Support package

• 2 full time climate advisors
• Access to technical assistance partners at different levels
• Micro-grant opportunities
American Cities Climate Challenge

Transportation
- Financing
- Market Transformation for EVs
- Mobility Vision
- Comp Plan & UDO
- Shared Mobility

Buildings
- Energy Efficiency Retrofits
- Renewable Energy
- Workforce Development
- Financing
### Action 1.1: Deep Energy Efficiency Retrofits of Cultural Facilities

**Foundational Action**

<table>
<thead>
<tr>
<th>2020 Objectives</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enhanced partnerships through creative financing and cost-share opportunities</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Identify deep retrofit opportunities</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Retro-commissioning of 7 cultural facilities</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Energy audits for 7 cultural facilities</strong></td>
<td></td>
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<tr>
<td><strong>Educational campaign</strong></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Ownership</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner: Laurie Sickles</td>
<td></td>
</tr>
<tr>
<td>Climate Advisor: John Thigpen</td>
<td></td>
</tr>
<tr>
<td>Key Staff: Heather Bolick, David Miller, Katie Riddle</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Indicators</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td># of energy audits completed</td>
<td></td>
</tr>
<tr>
<td># of retrofit opportunities identified</td>
<td></td>
</tr>
<tr>
<td># of creative financing/cost share opportunities identified</td>
<td></td>
</tr>
<tr>
<td># of facilities contracted for retrofit and retro-commissioning</td>
<td></td>
</tr>
<tr>
<td># of programs across the 7 cultural partners in addition to climate exhibition</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACCC Partners</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>IMT</td>
<td></td>
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</tbody>
</table>
## Action 1.2: On-Site Renewable Energy & Financing

**Foundational Action**

<table>
<thead>
<tr>
<th>2020 Objectives</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install ≥5 MW solar array at Statesville Landfill, CLT Water, or CLT Airport</td>
<td>Per Duke Energy, currently 58% of Charlotte’s electricity generation mix is already from zero-carbon sources, including nuclear, solar and hydro. This leaves 42% for the City to offset the energy consumed by our City buildings and fleet in order to achieve our 2030 GHG emissions reduction target.</td>
</tr>
<tr>
<td>Install a combined total of 500 kW of solar arrays on city-owned buildings (including Cultural)</td>
<td></td>
</tr>
<tr>
<td>Install 350 kW of solar PV across Charlotte’s Police &amp; Fire stations</td>
<td></td>
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</tbody>
</table>

### Ownership

**Who is the primary lead?**

Owner: Heather Bolick  
Climate Advisor: John Thigpen  
Key Staff: Laurie Sickles, Katie Riddle, Alicia Barone, Jackie Jarrell, Amanda Byrum, Will Rice, David Miller

### Key Indicators

**What metrics will measure success?**

- # of MW installed on City Property  
- # of kW installed at City-owned buildings (Statesville Landfill, CLT Water, CLT Airport)

### ACCC Partners

RMI/WRI
## Action 1.3: Workforce Development

### Foundational Action

Create "training to job" pipelines in key green industries based on current initiatives. The impact of this work will allow Charlotte to achieve short term and long term GHG reduction and economic mobility goals.

### Description

**Ownership**

- **Owner:** Emily Cantrell & Rob Phocas
- **Climate Advisor:** John Thigpen
- **Key Staff:** Kevin Dick, Pamela McGimpsey, Alex Alcorn, Carolyn Ross, Sherri Jones, Audrey Abron, Alison Siler

### 2020 Objectives

**City Apprenticeship Program** - 7 depts with 25 individuals, in total, training/hired

**Project P.I.E.C.E** - graduate 100 program participants by 2022

### Key Indicators

- # of departments that have hired individuals in work related to Charlotte's SEAP
- # of individuals trained
- # of individuals hired
- # of graduates from Project P.I.E.C.E.
- # of clean energy jobs programs that have accepted students from Project P.I.E.C.E.
- # of external partners confirmed

### ACCC Partners

TBD
**Action 2.1: Finance Programs Buildings (EE) & Fleet**

**Ambitious Action**

<table>
<thead>
<tr>
<th>2020 Objectives</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop a Total Cost of Ownership Model (TCOM)</td>
<td>Implement finance programs/policies that finance our ACCC and SEAP work. Bank of America and Duke Energy headquarters are located in Charlotte, and the city is also the Wells Fargo’s East Coast HQ. We have secured commitments from these major partners, and have started conversations with all three to work toward our ACCC goals and beyond.</td>
</tr>
<tr>
<td>Set up an Internal Energy Efficiency Fund</td>
<td></td>
</tr>
<tr>
<td>Partner with Bank of America, Wells Fargo and Duke Energy to use appropriate finance tools</td>
<td></td>
</tr>
</tbody>
</table>

**Ownership**

| Owner: Jennifer Wolf & Rob Phocas |
| Climate Advisor: Catherine Kummer & John Thigpen |
| Key Staff: Phil Reiger, Matt Hastedt, Laurie Sickles, Gina Shell, Alex Alcorn, Jordan Paschal, Chris Cauley |

**Key Indicators**

<table>
<thead>
<tr>
<th>What metrics will measure success?</th>
</tr>
</thead>
<tbody>
<tr>
<td>● $ amount funded/invested</td>
</tr>
<tr>
<td>● # of partnerships</td>
</tr>
</tbody>
</table>

**ACCC Partners**

| NRDC |
## Action 2.2: Market Transformation for EVs

### Ambitious Action

**Description**

Externally, by 2020, Charlotte will implement the Drive Clean Charlotte Program including a foundational network of DC Fast Charging and level 2 stations, encouraging more private ownership of EVs. Internally, Charlotte will strive to eliminate the need for any internal combustion light-duty vehicles within the municipal fleet.

**Ownership**

Owners: David Wolfe & Erika Ruane  
Climate Advisor: Catherine Kummer  
Key Staff: Steve Gucciardi, Chris Trull, Justin Amos, Doug Pierotti, Nick Zorn, Scott Kincaid, Courtney Schultz

**Key Indicators**

**Internal**
- % of new charging stations planned & installed that are solar
- % of light-duty municipal fleet replaced w/ EV motor pool
- % of light-duty fleet that is electric by 2030
- # of bus station fast chargers installed
- # of DCFC at airport
- % of overall fleet that is electric

**External**
- # of privately-owned EVs
- # of DCFC planned & installed
- # of workplace level 2 chargers installed
- # of public level 2 installed

---

### 2020 Objectives

**What would success look like in 2020?**

**Internal**
- Revise City Fleet Policy to have a ZEV requirement
- Two fast charging bus stations
- Two fast chargers at the airport
- Pass an “EV Ready” bldg code requirement
- Deploy solar-powered charging stations (25% of new installs)
- Develop an EV motor pool for light-duty municipal operations trips
- Replace 20% of unassigned light-duty municipal fleet with EV motor pool
- Replace 100% of unassigned light-duty fleet with EV motor pool by 2030

**External**
- 35 DC Fast Charging and 200 workplace level 2 stations
- 100 public level 2 chargers
- 10,000 privately-owned EVs in CLT by 2020
- 50% of all privately-owned vehicles in CLT to be EVs by 2030

---

### ACCC Partners

Electrification Coalition & Forth
### Action 3.1: Accelerate and Finance Key Elements of Mobility Vision

**Moonshot Action**

<table>
<thead>
<tr>
<th>2020 Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>What would success look like in 2020?</td>
</tr>
<tr>
<td>Identify innovative funding sources and strategies to finance 2030 Transportation Plan and Envision My Ride</td>
</tr>
<tr>
<td>Identify and begin implementation of innovative funding sources and strategies to finance Bike and Pedestrian Infrastructure</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
<tr>
<td>Charlotte is determined to be proactive and align growth with sustainable transportation and land use options. To achieve the 2020 objectives, Charlotte will identify eligible funding sources, apply for relevant funding, and receive funding to support design and implementation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ownership</th>
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</thead>
<tbody>
<tr>
<td>Who is the primary lead?</td>
</tr>
<tr>
<td>Owners: Jason Lawrence &amp; Rob Phocas</td>
</tr>
<tr>
<td>Climate Advisor: Catherine Kummer</td>
</tr>
<tr>
<td>Key Staff: Kathy Cornett, Lorna Allen, Vivian Coleman, Alex Alcorn</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>What metrics will measure success?</td>
</tr>
<tr>
<td>● # of community engagement events</td>
</tr>
<tr>
<td>● # of attendees of events</td>
</tr>
<tr>
<td>● # of projects submitted to planning</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACCC Partners</th>
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</thead>
<tbody>
<tr>
<td>NACTO &amp; Energy Foundation Grant</td>
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</tbody>
</table>
### Action 3.2: Development of a Comprehensive Plan (CP) and a Unified Development Ordinance (UDO)

#### Moonshot Action

<table>
<thead>
<tr>
<th>2020 Objectives</th>
<th>Setting and meeting targets for the majority of new, higher intensity development to be in walkable, transit accessible areas, including transit station areas and other activity centers designated in the CP. Incorporating “carbon cost” in the CP.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **Ownership**   | Owners: Kathy Cornett & Lorna Allen  
|                 | Climate Advisor: Catherine Kummer  
|                 | Key Staff: Jason Lawrence, Vivian Coleman, John Howard                                                                                                                                                  |
| **Key Indicators** | % of employees that have been engaged and informed of "carbon cost" definition  
|                  | % of tools & policies that account for "Carbon cost"  
|                  | # of times we can discuss GHG emissions within comp plan to City Council  
|                  | % of housing starts within 1 mile of high-frequency transit service, activity center, greenway trail  
|                  | % sq. footage of non-residential within 1 mile of high-frequency transit service, activity center, greenway trail                                                                                                                                 |
| **ACCC Partners** | ULI & NACTO                                                                                                                                 |

"Carbon cost" will become a standard when talking about growth & development

Measurable results for GHG emission reductions included in Comp Plan and are regularly communicated to our decision makers (ex: City Council)

More than 50% of new residential and 75% of new non-residential will be within 1 mile of high-frequency transit services, activity centers, and/or greenway trail
**Action 3.3: Shared Mobility Program**

**Moonshot Action**

<table>
<thead>
<tr>
<th>2020 Objectives</th>
<th>Description</th>
<th>Ownership</th>
<th>Key Indicators</th>
<th>ACCC Partners</th>
</tr>
</thead>
</table>
| **Increased use of scooters/bikes for first and last mile transit trips** | Charlotte will continue to lead the nation in embracing dock-less scooters/bikes, providing car-lite lifestyle options and addressing first and last mile solutions for our residents and visitors. | Owners: Vivian Coleman  
Climate Advisor: Catherine Kummer  
Key Staff: Jason Lawrence, Tangee Mobley, Dan Gallagher, Erika Ruane, Keith Sorensen | - # of miles used by scooters/bikes  
- % increase in trips  
- # of new users of scooters/bikes  
- # of total trips by scooters/bikes  
- # of new bicycle/pedestrian infrastructure miles built | Forth |
| **Provide car-lite mobility for first/last mile needs** | | | |

**American Cities Climate Challenge**
Recent Milestones

• EV ARC from CFAT Grant
  • Easy install
  • Can charge up to 225 miles of EV driving in 1 day
  • Emergency Power Panel
    ❖ 120 and 240 volt outlets
  • 40 kWh battery storage

• Approval of Contracts for Building Assessments and Energy Audits of Cultural Facilities
Memorandum of Understand with Duke Energy

Goal: to establish a low carbon, smart city collaboration

• Example projects:
  – Smart Technology: battery storage, smart grids, multi-use poles and lighting
  – Energy Efficiency: LED street lights, other retrofits
  – Fuel-Switching Mobile Sector (electric vehicles): electric vehicle infrastructure, fleet investments, charging stations
  – Fuel-Switching Stationary Sector (using electricity for building and water heating): waste to heat capture
  – Resilience: microgrids, district energy and battery storage, emergency preparedness
  – Transparency and Data Access: further the sharing of data as appropriate for low carbon goals
NORTH END SMART DISTRICT

in Charlotte

February 15, 2017
What is a “Smart” City?

A “Smart City” **collaborates** to use **data** and **technology** to inform decision-making and action on issues such as: mobility; safety; energy efficiency; community services; education; and environmental health.
Question of the Day . . .

- Can innovative smart city technology create coherent and inclusive cities?
  - No
- They are tools to be used by people for people.
The North End Smart District (NESD) Boundaries
What are the NESD neighborhoods?

- Optimist Park
- Graham Heights
- Lockwood
- Greenville
- Park at Oaklawn
- Druid Hills
- Genesis
- Brightwalk
What is the Vision for the NESD?

A vibrant center for economic development and job growth with a great quality of life fueled by data, innovative technologies, and collaboration on a foundation of equitable community engagement.
6 Pillars

1. Distributed Energy Micro Grid with Battery Storage
2. Gigabit Fiber Service
3. Leverage CIP Infrastructure Projects
4. Big Data
5. Facilitate an Innovation Campus
6. Building Human Capital
Building Human Capital

• How do we create economic mobility opportunities and address community identified needs?
  – Bridging Digital Divide
  – Strengthen Workforce Development
  – Create Employment for Existing Local Residents
  – Address Affordable Housing/Gentrification
  – Improve Mobility Options
  – Address Homelessness
  – Improve Streetscape of Major Roads
  – Protect Community Character
Community Engagement

• Meeting with neighborhood presidents and then residents.
• Dialogue with residents around hopes and fears and hesitations.
• Building community with residents, not for them.
It’s Collaborative Relationships

NORTH END
SMART DISTRICT

City of Charlotte Economic Development - Sustainability
It’s Community Driven Solutions
It’s Co-Created Meetings + Outreach

KEY PRINCIPLES:
- Venue in Community
- Evenings / After Work
- Thursdays preferred
- Provide Childcare
- Provide a Meal
It’s Co-Created Kick Start Projects
Shared Decision Making
Collaboration
Consulting
Information Sharing
NESD Kick Start Projects

1. Smart Home Utilities Savings
2. Mobility + Transit Options
3. Healthy Communities
4. Technology Training/Internet Café
5. Build your Own
Innovative Results

- Collaborative Relationships
- Private Sector Investments
- Community Driven Solutions
- Public Sector Spin Off Initiatives
- Co-created Kick Start Projects
- Co-created meetings + Outreach
- Projects that Better Serve the Community