Planning Education Series

Move
Restore
Energize
Thrive
Energize
Oakland Neighborhood Planning Education Series

SUSTAINABILITY AND RESILIENCE DIVISION
DEPARTMENT OF CITY PLANNING

Resilient Pittsburgh
Sustainability is defined as meeting the needs of the present without compromising the ability of future generations to meet their needs. The concept of sustainability is composed of three pillars: economic, environmental, and social—also known informally as profits, planet, and people. (can also be referred to as climate mitigation)

Urban resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience. This definition considers the global megatrends of climate change, globalization and urbanization. (can also be referred to as climate adaptation)
As global CO$_2$ concentration increases over time, so does global temperature.

Source: UN IPCC

Source: US NOAA
The greenhouse effect

Solar radiation passes through the clear atmosphere.

Some solar radiation is reflected by the earth and the atmosphere.

Most radiation is absorbed by the earth's surface and warms it.

Infrared radiation is emitted from the earth's surface.

Some of the infrared radiation passes through the atmosphere, and some is absorbed and re-emitted in all molecules. The effect of this is to warm the earth's surface and the lower atmosphere.

U.S. Greenhouse Gas Emissions in 2017

- Carbon Dioxide: 82%
- Methane: 10%
- Nitrous Oxide: 6%
- Fluorinated Gases: 3%

Source: US Department of Energy, Energy Intelligence Agency
Source: US Environmental Protection Agency
Pittsburgh’s Climate Action Plan

Pittsburgh’s 2030 Goals

- 100% renewable energy use
- 50% building energy use reduction
- 50% water use reduction
- 100% fossil fuel free fleet
- 100% waste diversion
- 50% transportation emissions reduction
- Divestment strategy for pension fund
Why is Energy so Important?

• Reducing carbon emissions mitigates the negative impacts of climate change
• Reducing air pollutants improves human health
• Money saved from reduced energy costs is good for residents and businesses
• Keeping the lights on minimizes disruption of services
Air Quality And Health

American Heart Association “State of the Air”
Failed for ozone and long and short term particulates

EPA Standards for PM 2.5
Has improved in past years, but beginning to show an uptick in pollution

PennEnvironment “Trouble in the Air” Report
Pittsburgh 4th in large metropolitan areas in number of days that air poses moderate to serious health risks

22% Childhood Asthma Rate in Some Schools
Compared to a 10% national average, study by local researcher

Allegheny County top 2% of counties at risk of cancer from air pollutants
Caused by energy generation and extraction, point source polluters and diesel emissions
Sources of Pollution

- “Toxic 10” point source polluters
- Pittsburgh’s topography lends itself to inversion events, causing pollution from regional energy generation to linger
- Vehicle emissions
Sources of energy for the City of Pittsburgh grid

<table>
<thead>
<tr>
<th>Generator</th>
<th>Generation Type</th>
<th>Output (MW)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaver Valley</td>
<td>Nuclear</td>
<td>1831</td>
<td>69.46</td>
</tr>
<tr>
<td>Brunot Island</td>
<td>Natural Gas (Peaker)</td>
<td>220</td>
<td>8.34</td>
</tr>
<tr>
<td>Cheswick</td>
<td>Coal</td>
<td>578</td>
<td>21.93</td>
</tr>
<tr>
<td>Patterson</td>
<td>Hydroelectric</td>
<td>2</td>
<td>0.27</td>
</tr>
<tr>
<td>Townsend</td>
<td>Hydroelectric</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>Total MW</strong></td>
<td></td>
<td><strong>2636</strong></td>
<td></td>
</tr>
</tbody>
</table>
Weather Normalized Emissions

- Waste - Private Collection Landfill
- Waste - Public Collection Landfill
- Transportation - Diesel
- Transportation - Gasoline
- Industrial Electricity
- Industrial Natural Gas
- Commercial Electricity
- Commercial Natural Gas
- Residential Electricity
- Residential Natural Gas
Weather Normalized Sector Breakdown

- Residential, 1,193,128, 25%
- Commercial, 2,447,908, 51%
- Industrial, 265,684, 6%
- Transportation, 833,781, 17%
- Waste, 48,406, 1%

Total: 5,270,029
Weather Normalized Source Breakdown

- Electricity: 2,687,069, 56%
- Natural Gas: 1,219,651, 25%
- Gasoline: 663,827, 14%
- Diesel: 169,954, 4%
- Waste: 48,406, 1%
2013 Greenhouse Gas Emission Breakdown

*Transportation emissions are estimated should be considered only to be of this general order of magnitude*
What is resilience?

100 Resilient Cities defines urban resilience as the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.
Pittsburgh’s focus on resilience

- Preliminary Resilience Assessment (2016)
- ONEPGH Resilience Strategy (2017)
- Pittsburgh Equity Indicators (2018 + 19)
Impacts of Climate Change in PGH

**STRESS**
Aging Infrastructure

**SHOCK**
Climate Change: Warming and wetting, increased rainfall frequency, intensity and duration

**IMPACT**
Infrastructure failure, flooding
Impacts of Climate Change in PGH

**STRESS**
Fragile hillsides, aging infrastructure

**SHOCK**
Climate Change: Warming and wetting, increased rainfall frequency, intensity and duration

**IMPACT**
Landslides, Subsidence

Figure 4.2 Map of Pittsburgh Landslide, Subsidence and Flood Risk
Impacts of Climate Change in PGH

**STRESS**
Urban heat island, aging infrastructure

**SHOCK**
Climate change and extreme weather: increased temperatures lead to increased energy consumption

**IMPACT**
Extended grid failure, disruption of services, poor air quality, increased emergencies
District Energy in Pittsburgh

Northside District Energy
NRG Energy Center Pittsburgh
Currently serves 30 Buildings
(including PNC Park, the Carnegie Science Center and Allegheny General Hospital)
Capacity:
240 Mbtu/hour of steam
20.4 MMBtu/hour of hot water
12,580 tons of chilled water

Brunot Island
Potential energy-from-waste plant adjacent to Allegheny County Sanitary Authority (ALCOSAN)

PACT
Downtown Energy District
Pittsburgh Allegheny County Thermal, Ltd (PACT)
Currently serves 99 Buildings (including City County Building, Allegheny Courthouses, the Westin and the Hilton Hotels)
Capacity:
500,000 lbs of steam per hour

Uptown EcoInnovation District
Uptown Energy District
Duquesne University has a cogeneration plant.
Possibility for a new district energy system to serve the 28-acre Lower Hill site

Larimer Energy District
Possibility for a community microgrid system to serve 285 acre residential neighborhood redevelopment

Oakland Energy District
Carnegie Museum of Pittsburgh:
Bellefield Baker
Capacity: 480,000 lbs/hour of steam
University of Pittsburgh:
Camilo Steam Plant
Capacity: 690,000 lbs/hour of steam
Interconnected systems

ALMONO Energy District
Possibility for a district energy system to serve the 178 acre planned urban waterfront mixed use property development
Addressing energy burden improves health

- **Energy Burden** is the percentage of gross household income spent on energy costs.
- **Pittsburgh residents pay almost twice the national for energy although utility costs for energy** and gas are among the lowest nationally.
- 6th worst city in the country with residents suffering from Energy Burden, second worst for African Americans experiencing Energy Burden.
- ACEEE reports note a 15% decrease in Pittsburgh’s energy consumption could result in healthcare savings of $200 per capita.
Transportation emissions impact air quality

Source: Albert Presto/CMU/Breathe Project
Environmental Impacts
Gasoline Car Vs. Electric Car

Electric cars in Pittsburgh would have lower emissions as compared to gasoline cars:
- 33% reduction in CO₂ eq. emissions per km
- 60% reduction in NOₓ emissions per km

Sources: Results from Siemens' Shared eMobility Calculator
## Electrification Goals

**EV Task Force formed September, 2018 to enable EV adoption city-wide.**

<table>
<thead>
<tr>
<th>Audience</th>
<th>Needs</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Municipal Fleet</strong></td>
<td>Purchase and deploy vehicles</td>
<td>Start with sedans and existing infrastructure</td>
</tr>
<tr>
<td></td>
<td>Purchase and deploy charging infrastructure</td>
<td>Couple with renewable energy generation, ensure ease of use</td>
</tr>
<tr>
<td><strong>Other Fleets (car share, taxis, private businesses, etc.)</strong></td>
<td>Enable and incentivize charging infrastructure development for fleets operating in City of Pittsburgh</td>
<td>DC fast charging in convenient locations for taxis</td>
</tr>
<tr>
<td></td>
<td>Find opportunities to share fleet charging infrastructure with gov’t or residential</td>
<td></td>
</tr>
<tr>
<td><strong>Residential</strong></td>
<td>Enable charging opportunities for residents (esp. those without driveways)</td>
<td>Permitting within the right of way, neighborhood hubs for level 2 and DCFC</td>
</tr>
<tr>
<td></td>
<td>Reduce “range anxiety” for long trips</td>
<td>DC fast charging along interstates and main thoroughfares</td>
</tr>
</tbody>
</table>
Existing charging infrastructure in Pittsburgh
EV Task Force Recommendations

*EV’s include not just passenger cars and trucks, but electric bikes, scooters, busses and industrial/freight trucks.

- **Residential on-Street charging pilots to determine policy**
  - Typologies based on density and parking permits
    - City-owned
    - Resident permitted to use cords or install in right of way

- **Commercial district on-street charging**
- **EV readiness in new construction**
- **Neighborhood e-charging hubs**
- **Coupling with on-site renewable energy**
THANKS!

Rebecca Kiernan
Resilience Planner
rebecca.kiernan@pittsburghpa.gov
Energy and the Consumer

Krysia Kubiak

DUQUESNE LIGHT CO.
DLC Introduction

- Western PA Service Territory
  - Allegheny County
  - Beaver County

- 817 Square Miles

- 600,641 Customers
  - Residential
  - Commercial
  - Industrial

- All Time Peak Load
  - 3,054 MW (June 2012)

- Peak Load 2018
  - 2,796 MW (September)
DLC operates as a privately owned **Non-Vertically Integrated** utility

*What does that mean?*

- We do not own generation.
- We maintain and operate the poles and wires.
- We provide customers with reliable, safe, and affordable electricity.
Nearby Power Station

**Beaver Valley**
- # of Units: 2
- Capacity: 1,800 MW
- Fuel: Nuclear

**Brunot Island**
- # of Units: 5
- Capacity: 290 MW
- Fuel: Natural Gas
- Black Start: Diesel

**Cheswick**
- # of Units: 1
- Capacity: 590 MW
- Fuel: Coal
The Grid – PJM Fuel Mix

As of August 8, 2019 12:00 p.m. EPT

Total 124,366 MW

Renewables 6,399 MW

- Coal
- Gas
- Hydro
- Multiple Fuels
- Nuclear

Oil
Other
Other Renewables
Solar
Wind

As of August 8, 2019 12:00 p.m. EPT

Renewables 6,399 MW

- Hydro
- Other Renewables
- Solar
- Wind
The Grid – Region Fuel Mix
Installed Capacity for DLC Zone - As of June 30, 2018, provided by PJM

≈ 70% nuclear carbon-free generation
Decrease Coal
Decommissioning Coal-Fired Power Plants

Changes to the Grid
Decreasing emissions

2018: Renewables provided 17.6% of electricity generation
Fuel conversion efficiency of 50% or more
  - burn about half the amount of fuel as a conventional power plant to generate the same amount of electricity

Less fuel per kWh causing lower GHG emissions than traditional coal power plant
  - Emits about half the amount of CO2 compared to coal

Pounds of CO2 emitted per million British thermal units (Btu) of energy for various fuels

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>CO2 Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal (anthracite)</td>
<td>228.6</td>
</tr>
<tr>
<td>Coal (bituminous)</td>
<td>205.7</td>
</tr>
<tr>
<td>Coal (lignite)</td>
<td>215.4</td>
</tr>
<tr>
<td>Coal (subbituminous)</td>
<td>214.3</td>
</tr>
<tr>
<td>Diesel fuel and heating oil</td>
<td>161.3</td>
</tr>
<tr>
<td>Gasoline (without ethanol)</td>
<td>157.2</td>
</tr>
<tr>
<td>Propane</td>
<td>139.0</td>
</tr>
<tr>
<td>Natural gas</td>
<td>117.0</td>
</tr>
</tbody>
</table>

PJM Emissions

PJM - Average Emissions (lbs/MWh)
(February 1, 2018)

PJM Average Emissions (lbs/MWh)

- CO₂ (lbs/MWh)
- SO₂ and NOₓ (lbs/MWh)

- Carbon Dioxide
- Nitrogen Oxides
- Sulfur Dioxides

Year: 2005 to 2017
Pennsylvania Emissions
As of July 2019

**DLC and Renewable Energy**

Total Connected Net Metered Customers – 2,721

Total Connect Net Meter Capacity – 24.133 MW

Promoting PA Local Solar Act sponsored by Sen. Jay Costa

“In the near future, I will introduce legislation that expands access to solar power in Pennsylvania through a localized renewable program, while also assuring adequate ratepayer protections.”

Last year, DLC sourced credits representing 281,270 MWh of electricity from renewable sources*

---

* This number accounts for Tier I and solar energy credits, sourced between June 1, 2017-May 31, 2018. DLC sourced another 334,141 MWh worth of energy credits from Tier II “alternative” energy sources.
Renewable Energy Purchasing
PA Power Switch

Visit papowerswitch.com

Not the correct link
Renewable Energy Purchasing
PA Power Switch

Visit papowerswitch.com

Correct link
PA Power Switch

*Duquesne Light does not endorse any specific supplier

Fill in your zip code
PA Power Switch

*Duquesne Light does not endorse any specific supplier

Select your customer class

Your Results

YOUR ELECTRIC DISTRIBUTOR IS DUQUESNE LIGHT

Please select your rate schedule, which you can find just above your charges on your bill:

- RS - Regular Residential Service
- RA - Residential Add-on Heat Pump Service
- RH - Residential Heating Service

Rate Change Alerts

First Name
Last Name
Email Address
Zip Code

Subscribe

Education

Educate yourself on all aspects of the power switching experience here, from why to switch to what questions to ask.

Ways to Save

There are plenty of ways to continue saving money after you’ve switched power companies.

Learn How to Save »
PA Power Switch
*Duquesne Light does not endorse any specific supplier

Estimated price for usage
DLC price to compare
Click “See Full Results” to see different offers available in your area
Stable Electricity Pricing
DLC Past Pricing

Fluctuates less than 1¢ over 3.5 years
PA Power Switch
*Duquesne Light does not endorse any specific supplier

Filter your search...
- Fixed price
- Special programs (Renewable Energy, PA Wind, Renewable PA)

Currently...
- 20 renewable options
- 2 PA Wind options
- 1 Renewable PA option
CUSTOMER OWNED GENERATION

We welcome customers who would like to interconnect a qualified, renewable energy generating system, such as a solar panel or wind turbine, to our transmission and distribution system.

Following are links to a variety of information, including requirements and procedures to move on interconnection:

- Requirements
- Frequently Asked Questions
- Standards for the Connection of Generating, Excipient and Transmission Facilities PDF

APPLICATION PROCEDURE

Customer Checklist:

I. Part 1 Interconnection Application Submission Requirements:

1. Customer is required to submit the following:
   - 1. Part One Application – Level 1 Application Agreement OR Level 2, 3, 4 Application Agreement
   - 2. Site Plan – Diagram of proposed site plan
   - 3. One-line diagram – Click here to view Example One-line diagram
   - 4. Equipment Details
   - 5. Site Plan: Diagram of interconnection location
   - 6. Application Fee

Please note: All submitted engineering documents must be computer generated (no hand drawn submittals will be accepted).

II. Application Description & Fees:

1. Level 1 - Certified interconnect board installed with aggregate rating 10 kW or less - $500 Level 1 Interconnection Application
2. Level 2 - Certified interconnect board installed with aggregate rating 10 kW to 2,000 kW - $250 plus $10 per kW Levels 2, 3, 4 Interconnection Application
3. Level 3 - Non-Certified equipment 1,000 kW or less that will export power to Duquesne Light Company - $750 plus $2.50 per kW Levels 3, 4 Interconnection Application
4. Level 4 - Non-Certified equipment 1,000 kW or less that will export power to Duquesne Light Company - $750 plus $2.50 per kW Levels 3, 4 Interconnection Application

III. How to Submit Documentation:

IV. Upon Receiving the Part 1 Interconnection Application:

V. After Part One Approval:

VI. Part 2 Application (Certificate of Completion) Submission Requirements:

VII. Upon Receiving Part 2 Application:

START A NEW APPLICATION  CHECK STATUS
Energize Oakland

August 14, 2019
Contents

• Phase III Requirements
• Residential Programs
• Residential Web Portal “My Electric Use”
• Residential Marketplace
• DLC Electric Vehicles Web Portal
• Contact
• Energy Consumption Reduction of 440,916 MWh

• 5 Year Phase III Period: June 1, 2016 – May 31, 2021

• Includes MW or Peak Demand Requirement of 42 MW

• Low Income Target of 5.5% which is 24,250 MWh

• GNI Carve out Target is 3.5% which is 15,432 MWh

Note: On June 11, 2015, the Commission entered an Implementation Order at Docket No. M-2014-2424864 for Phase III program planning along with a Clarification Order issued on August 20, 2015 which contained the regulatory requirements and savings goals.
Residential Programs
Residential Programs

- Phase III Plan retained successful energy efficiency programs:
  - Downstream and Upstream Rebates
  - Conservation Kits
  - Giveaways
  - Whole House Retrofit
  - Appliance Recycling
  - Home Energy Report
  - Low Income Energy Efficiency
    - Low Income Multifamily Housing Retrofit
    - Low Income Home Energy Reporting
    - Low Income Whole House Retrofit
Welcome to EnergyInsights which will show you where your home's energy dollars are going, and tips on how you can save.

Active Duquesne Light residential customers who click on Detailed Analysis button and complete the EnergyInsights Audit will receive a free Energy Efficiency Kit through the mail.

**ONE TIME OFFER**
- The Kit contains 8 LED lamps and 2 nightlights.
- The Kit will be delivered in 6-8 weeks.
- The Kit will be delivered to your Duquesne Light service address, not to an alternative mailing address you may have listed on your account.

Learn how to cut your energy bill!

A FREE, easy-to-use online tool to give you a Detailed Analysis of your home energy use in less than three minutes or an Instant Analysis of your most recent Duquesne Light bill.

Enter your account number to get started...

Then Choose...

[DETAILED HOME ANALYSIS] [INSTANT BILL ANALYSIS]
Residential Web Portals
Residential Web Portal – My Electric Use

Dashboard

How you’re doing
You’re using 12% more electricity than your neighbors.

Efficient neighbors: 271 kWh
All neighbors: 619 kWh
You: 693 kWh

Projected bill
$99
Jul 25 – Aug 23

That’s about $52 more than last year.
You’ve spent about $61 so far this bill period.

Tips for Your Home
- Wash laundry with cold water
  5,665 people do this
- Use a moisture sensor on your dryer to avoid over-drying
- Set your thermostat to 78°F in the summer

See ways to save

Efficient neighbors are the 20% who use the least amount of energy.

See ways to save
Residential Web Portal – My Electric Use

Similar Home Comparison

Dec 25 – Jan 23
You 352 kWh
All similar homes 427 kWh
Efficient 227 kWh

Find tips to reduce your use:
- Free steps to take
- Smart purchases
- Great investments

What homes are compared?
Residential Web Portal – My Electric Use

Hourly Usage

Fuel type: electricity

Fri, Aug 9, 2019
My usage

2.13 kWh

Select view: by day

Your usage

12 am  6 am  noon  6 pm  11 pm

Similar homes  Usage  Costs  Weather
Residential Web Portal – My Electric Use

Cost Comparison

Fuel type: electricity

Aug 2018 – Jul 2019
My costs

Select view: by year

Steps you can take:
- View tips for reducing your use
- Get alerts for expensive times
Residential Web Portal – My Electric Use
Weather Impact

Fuel type: electricity

Aug 2018 – Jul 2019
My usage & weather

Find tips to reduce your use:
- Free steps to take
- Smart purchases
- Great investments

Similar homes
Usage
Costs
Weather
Residential Web Portal – My Electric Use
Projected Bill and Estimated Bill to Date

Projected bill

$99

Jul 25 – Aug 23

That’s about $52 more than last year.
You’ve spent about $61 so far this bill period.

See ways to save
Watt Choices Energy-Efficient Product Marketplace

Search all major retailers at once and find energy efficient products.

Search by type, brand, model...

Thermostats
Light Bulbs
Refrigerators
Dehumidifiers
Freezers
EV Chargers

Explore More Categories

We help you find your perfect product

The Enerevee Score
Our algorithms analyze and score products daily based on their energy efficiency.

All reviews in one place
One rating that combines reviews from leading retailers and trusted experts.

Get the best deals
Track and get notified of price drops and find rebates for your favorite products.
Residential Web Portal - Marketplace

30 EV Chargers

- ClipperCreek LCS-20P 16 Amp Level 2 EV
  - Rating: 4.5/5 (63) - Price: $395

- ClipperCreek LCS-20P 16 Amp Level 2 EV
  - Rating: 4.5/5 (48) - Price: $589

- ClipperCreek LCS-40P 32 Amp Level 2 EV
  - Rating: 4.5/5 (136) - Price: $589

- ClipperCreek HCS-40P 32 Amp Level 2 EV
  - Rating: 4.5/5 (130) - Price: $565

- ClipperCreek LCS-20P 16 Amp Level 2 EV
  - Rating: 4.5/5 (90) - Price: $379

- ClipperCreek LCS-20P 16 Amp Level 2 EV
  - Rating: 4.5/5 (62) - Price: $395

- eMotorWorks INPRBU40A2... JuicelBox Pro 40 Lite - 40-Amp WiFi EV
  - Rating: 4.5/5 (447) - Price: $549
Residential Web Portal – Electric Vehicles

YOUR GUIDE TO ELECTRIC VEHICLES

Compare costs, savings, incentives, and more.

- Browse Electric Vehicles
- Discover Incentives
- Locate Charging Stations

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Contacts

Dave Defide

- Sr. Manager, Customer Programs
- (412) 393-6107
- ddefide@duqlight.com