

RVAgreen 2050 Buildings & Energy Working Group
2/17/2021

Drafting Strategies



Equitable climate action for a healthy and resilient Richmond

Agenda

- Settling in and ground rules
- Review: RVAgreen 2050 structure
- Buildings & Energy strategy inputs
- **Activity:** Drafting strategies
- Wrap-up and next steps

Today's Objectives

- Understand the various inputs (tools, technical resources, existing plans, etc.) for RVAgreen 2050
- Draft equitable climate action and resilience strategies!

Ground Rules / Group Expectations



RVAgreen 2050 DRAFT Structure

Goals	What is the purpose of RVAgreen 2050?
Vision	What does the ideal future look like when RVAgreen 2050 is implemented?
Community Priorities	What cross-cutting public values do we want to center in our plan?
Pathways	What leverage points will lead us towards realizing and operationalizing the goals and community priorities?
Objectives	What are the long-term aims we want to accomplish, organized into the different pathways?
Strategies	What are the SMARTIE actions that will lead us toward our objectives?
Implementation Plans	How are we going to implement, measure progress, and ensure accountability in this plan?



Goals

Climate Action

Achieve a 45% reduction in greenhouse gas emissions by 2030 from the 2008 baseline

Achieve net zero greenhouse gas emissions by 2050

Climate Resilience

Prepare for, adapt, and improve the City of Richmond's resilience to the local impacts of climate change

Goals

Vision

Community
Priorities

Pathways

Objectives

Strategies

Implementation
Plans

Vision

All Richmonders, regardless of their identity or neighborhood, thrive in a climate-resilient and climate-neutral community.

Supporting Principles:

- Community and personal **well-being, local ecosystems, and economic vitality** are balanced in a truly sustainable Richmond.
- Everyone has **equitable access across the entire city to resources that are clean, sustainable, and affordable**, including air, water, food, energy, housing, transportation, economic opportunities, and natural resources.
- **Everyone has the ability and resources to take ownership** of equitable climate action and community resilience planning and implementation.
- "Identity" includes but is not limited to: race, ethnicity, age, ability, gender, sexual orientation, and religion. **We lead with race** in our work to transform systems impacting all historically disenfranchised communities.



Goals

Vision

Community
Priorities

Pathways

Objectives

Strategies

Implementation
Plans

Community Priorities



Racial Equity &
Environmental Justice



Engagement &
Communication



Government
Accountability



Community
Wealth



Housing &
Buildings



Neighborhoods



Health & Well-
Being



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Revised Pathways

Buildings & Energy	Accelerate the equitable transition to healthy, resilient, climate neutral buildings and energy sources
Waste Reduction & Recovery	Fostering sustainable methods of waste reduction - wasting less, reusing more toward a zero waste community
Transportation & Mobility	Accelerate the transition for all to clean and equitable mobility systems
Environment	Invest in resilient, healthy, and equitably distributed natural resources throughout the community to support biodiversity and human well-being
Community	Create an equitable and resilient Richmond that honors community priorities



Goals

Vision

**Community
Priorities**

Pathways

Objectives

Strategies

**Implementation
Plans**

Objectives

What are the long-term aims we want to accomplish, organized into the different pathways?

Objective 1: Achieve climate neutrality and increase resilience in government buildings, infrastructure, and operations.

Objective 2: Maximize energy efficiency, performance and resilience in all existing buildings.

Objective 3: Ensure all Richmonders have equitable access to affordable and resilient renewable energy.

Objective 4: Achieve climate-neutrality and maximize resilience in all new buildings.



Where we are today...

Goals	What is the purpose of RVAgreen 2050?
Vision	What does the ideal future look like when RVAgreen 2050 is implemented?
Community Priorities	What cross-cutting public values do we want to center in our plan?
Pathways	What leverage points will lead us towards realizing and operationalizing the goals and community priorities?
Objectives	What are the long-term aims we want to accomplish, organized into the different pathways?
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Refining

Drafting

RVAgreen 2050 Inputs Overview



Equity

- Climate Equity Index
- Training and capacity building
- Community priorities
- Equity Screening Tool

Climate Action

- Greenhouse gas inventories
- Richmond 300 actions
- Best practices and examples
- Greenlink GHG emissions modeling

Climate Resilience

- Climate change impacts data
- Richmond 300 actions
- Best practices and examples
- Climate Vulnerability & Risk Assessment



Goals

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Implementation
Plans

Drafting Process - Strategies

Buildings &
Energy Inputs

Technical Information

Climate and Energy Modeling
Climate Vulnerability & Risk Assessment

Policy Inputs

RVAgreen 2050 Community Priorities
Greenlink Policy Toolkit
Examples from other cities

Today's activity

Starting Point for

Strategies

Richmond 300 Master Plan
Your ideas from last time



Your task today: drafting strategies

Preliminary checklist for strategies:

- Does it *reduce greenhouse gas emissions* **or** *increase resilience to climate change*?
- Is it equitable? (we will dive deeper into the equity tool at the next meeting)



Goals

Vision

Community
Priorities

Pathways

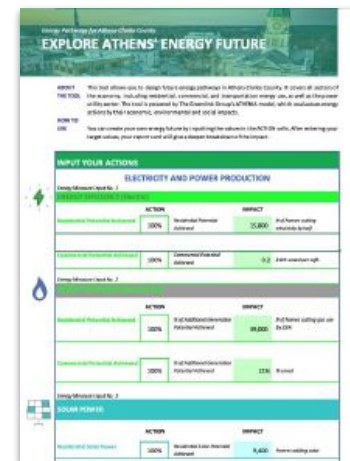
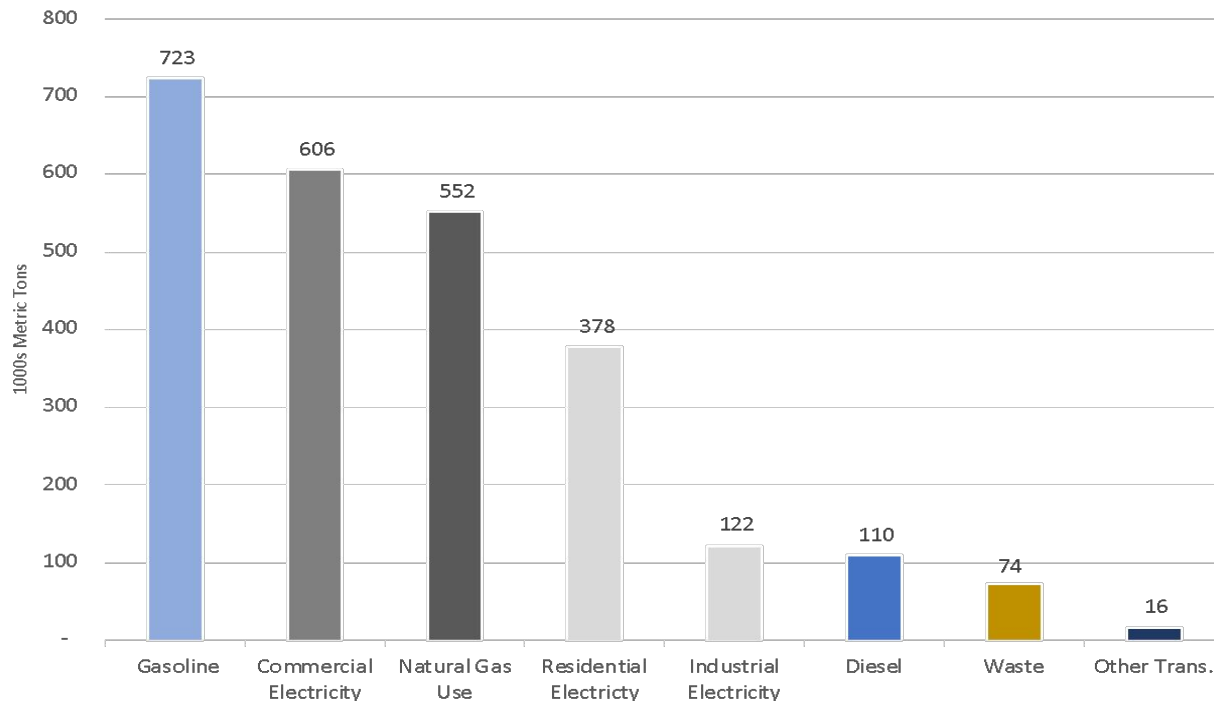
Objectives

Strategies

Implementation
Plans

Buildings & Energy Input: Climate & Energy Modeling

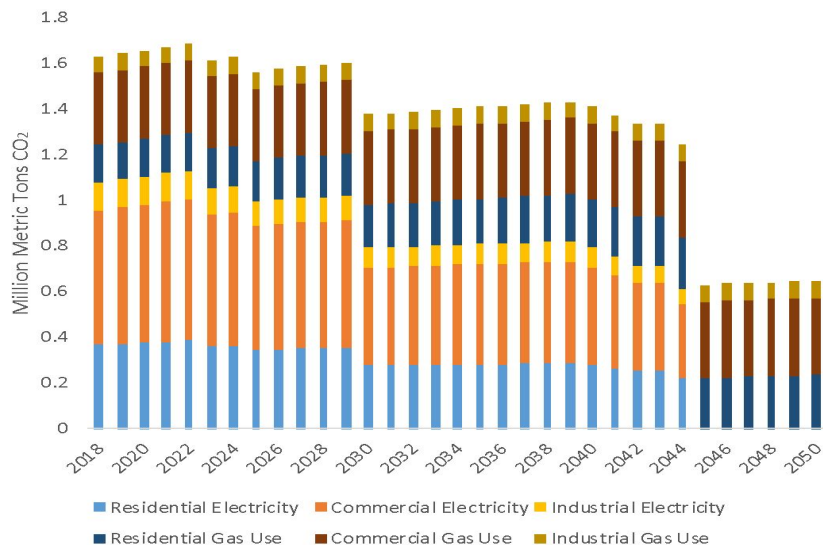
Current greenhouse gas emissions



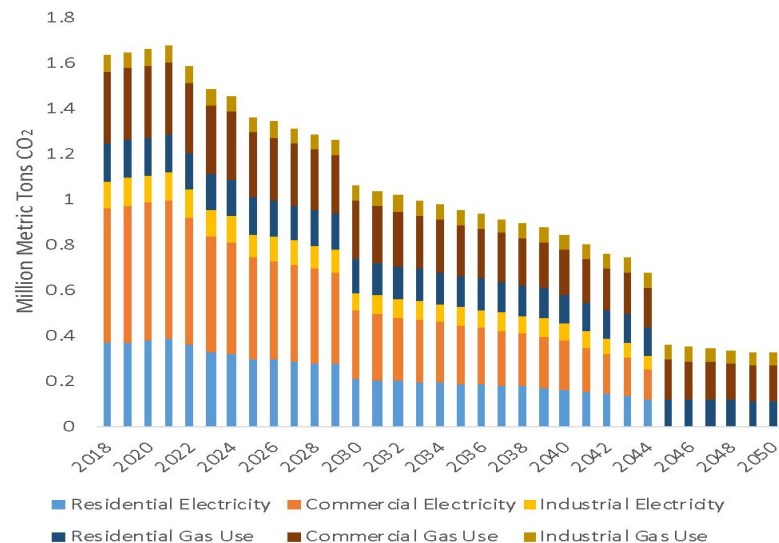
Buildings & Energy Input: Climate & Energy Modeling



Business as usual scenario: if we take no action



Max scenario: if we take ambitious action

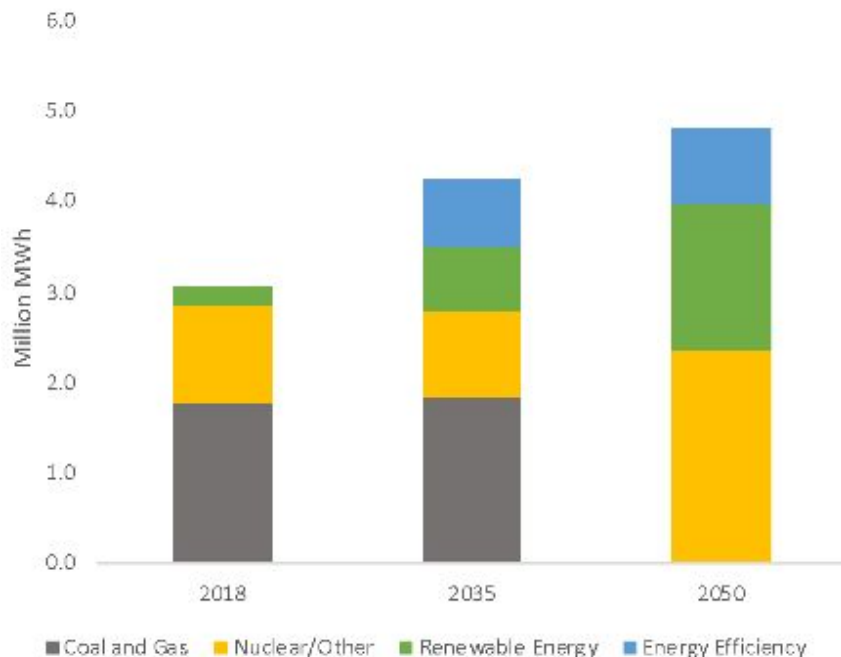


Buildings & Energy Input: *Climate & Energy Modeling*

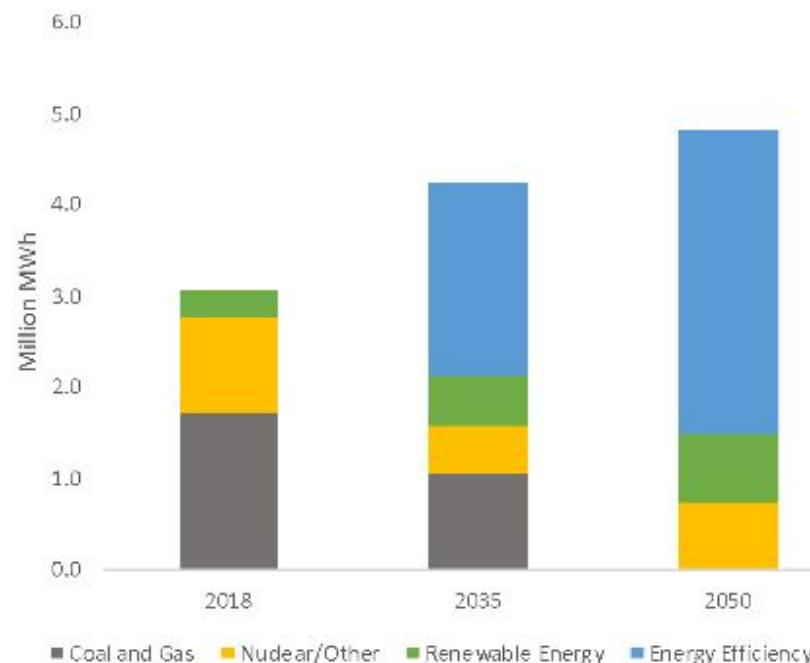


Energy Efficiency Significantly Reduces Electricity Demand

BAU



Max Scenario



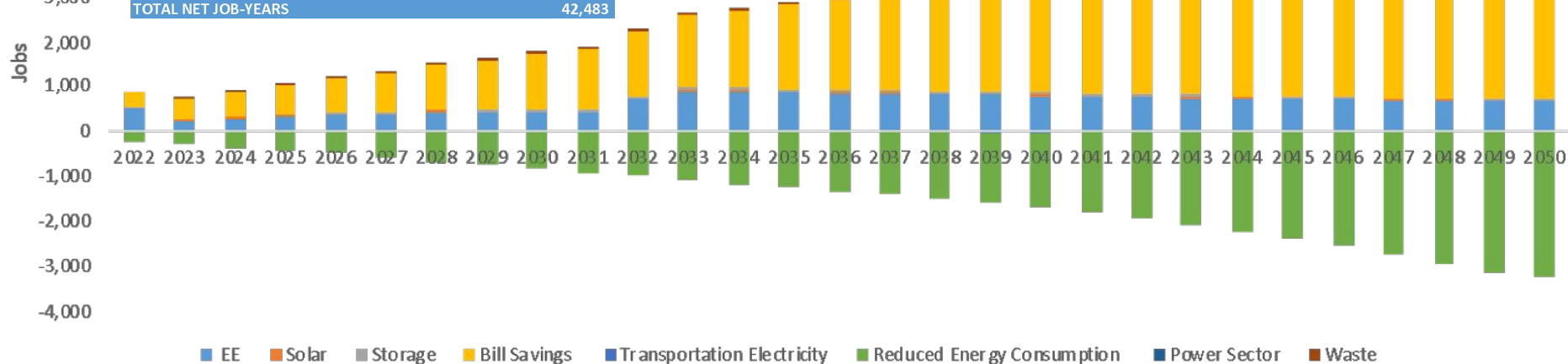
Buildings & Energy Input: Climate & Energy Modeling



Co-benefits of taking ambitious action

NET JOB-YEARS THROUGH 2050

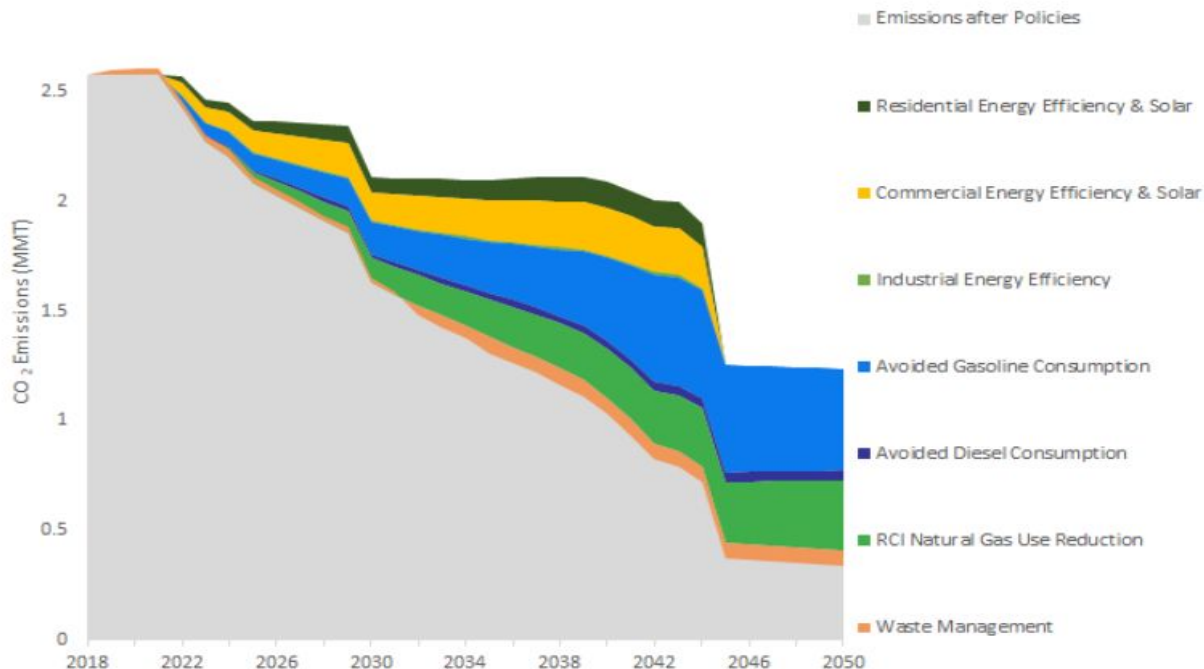
Sector	Net Job-Years
Construction	6,643
Lighting	1,917
Material for Envelope	1,494
Other Electrical Equipment	929
Energy and Environmental Management and Smart Controls	4,154
Insurance and Finance	440
Program Administration	1,882
Architecture and Engineering Services	1,438
Waste	810
General Economy	65,494
Fuel and Utilities	(42,717)
NET GAIN	85,200
NET LOSS	(42,717)
TOTAL NET JOB-YEARS	42,483



Buildings & Energy Input: *Climate & Energy Modeling*



Max scenario: CO₂ emissions trajectory if we take ambitious action



Buildings & Energy Input: *Climate Vulnerability & Risk Assessment*

Sensitivity

How much would assets/systems be affected?

Adaptive Capacity

Can the assets/systems “bounce back” on their own?

Consequence

- People, esp. those most vulnerable
- Literal costs
- Public safety services
- Economic activities
- Public health
- Natural environment

Probability

What assets/systems are actually in harm's way?

Your input
from the
meeting

Detailed
analysis of
climate data

Relative vulnerability of assets/systems:

Buildings & Infrastructure

- Affordable Housing (HUD/RRHA)
- Sewer Treatment Plant
- Public Safety Buildings
- Emergency Operations
- Hospitals
- Colleges & Universities
- Public Schools
- Community Centers & Libraries
- City Buildings
- Convention Center & Museums
- State/Federal Buildings
- Historic Resources
- Businesses

Energy

- Electric Power Transmission Lines
- Electrical Substation
- Natural Gas Pipelines
- Petroleum Ports & Terminals
- Biodiesel Plants
- Non-Gasoline Alternative Fueling Stations
- Potential Renewable Energy Sites
- Communications Infrastructure

Buildings & Energy Input: Climate Vulnerability & Risk Assessment

Energy Assets/Infrastructure

Asset/System	Heat Threats Priority	Water Threats Priority
Electrical Substation	1	1
Petroleum Ports	4	2
Electric Power Transmission Lines	2	3
Natural Gas Pipelines	5	4
Petroleum Terminals	3	5
Non Gasoline Alternative Fueling Stations	6	6
AM Transmission Towers	7	7
Biodiesel Plants	11	8
FM Transmission Towers	8	9
Land Mobile Broadcast Towers	9	10
Cellular Towers	10	11
Potential Renewable Energy Sites	12	12

Specific feedback:

- **Electric Power Transmission Lines:** Heat poses multiple threats to electrical power transmission. Storms and flooding are a major threat to electrical power transmission. Service and community impacts.
- **Electrical Substation:** Assets within floodplain. Service operations impacts.
- **Natural Gas Pipelines:** Short and long term impacts of flooding. Service impacts.
- **Petroleum Ports & Terminals:** Warming could reduce lifespan of tanks. Concern for leaks and water pollution caused by flooding of tanks.
- **Biodiesel Plants:** Flooding impacts to service.
- **Communications Infrastructure:** Storms a threat to infrastructure and cell service

Buildings & Energy Input: Climate Vulnerability & Risk Assessment

Buildings & Infrastructure Assets/Systems

Category	Asset/System	Heat Threats Priority	Water Threats Priority
Housing & Buildings	RRHA Housing	2	1
Stormwater & Sewer	Sewer Treatment Plant	3	2
Green	Parks and Playgrounds	1	3
Public Safety	Correctional Facilities	12	4
Housing & Buildings	HUD - Multifamily Assisted	4	5
Public Safety	Local Emergency Operations	8	6
Businesses	Fortune 500 Corporate Headquarters	21	7
Housing & Buildings	Social Services	5	8
Education	K-12 Public Schools	6	9
Public Safety	National Shelter System Facilities	7	10
Public Safety	Sheriff Facilities	10	11
Health	Hospitals	9	12
Historic Resources	State/Federal Historic Sites	18	13
State/Federal Buildings	Major State Government Buildings	19	14
State/Federal Buildings	State Capitol Buildings	20	15
Public Safety	Fire Stations	16	16
Public Safety	Police Stations	11	17
Public Safety Buildings	Courthouses and Court System	17	18
City Buildings	City Property	15	19
Community Buildings	Community Centers	13	20
Community Buildings	Libraries	14	21
Historic Resources	National Register Historic Districts	23	22
Historic Resources	City Historic Sites	25	23
Historic Resources	City Historic District	24	24
Community Buildings	Museums	22	25
Convention Center & Museums	Convention Center	27	26
Education	Colleges and Universities	26	27

General feedback:

- Community buildings and valuable assets within floodplain; system operations on community impacts
 - Floods affect buildings even if the river flood doesn't reach them. This is because a sewer can backup because the water has few options to drain. If the power is out, pump stations cannot work.
- Everything is so **interrelated** that an asset's capacity might be affected by another

Specific feedback:

- Sewer Treatment Plant:** Since the water treatment plants are on the river, we plan for floods, but chronic and acute. Nevertheless, floods, rainy years, and the associated events, affect operations and building. For example, the 100 year **flood plain designation by FEMA, have been raised by 3 ft.** This means raising buildings that are susceptible to flood. We must raise the electrical drives that control motors.
- City Buildings:** Water threat impacts are very **location sensitive**.
- Convention Center & Museums:** Convention centers and other large public buildings are often used as **shelters** in times of emergency.

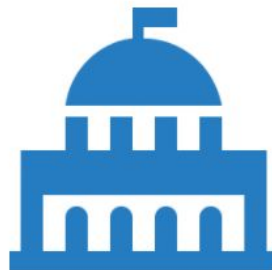
Buildings & Energy Input: *Community Priorities*



Racial Equity &
Environmental Justice



Engagement &
Communications



Government
Accountability



Community
Wealth



Housing &
Buildings



Neighborhoods



Health & Well-
Being

Buildings & Energy Input:

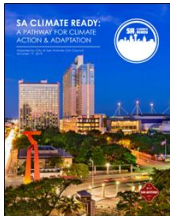
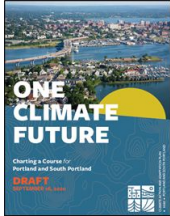
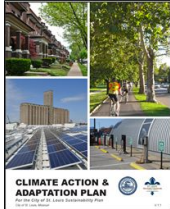
Greenlink Policy Toolkit - Examples

Building Performance Standard
Promote 'Green' Loans
Net Zero Energy Code
VEPCO Commercial Efficiency Custom Rebate Program
Update Building Energy Codes
Bundled Clean Energy
Green Building Rebate / Tax Credit for New Construction
Commuter Carpooling Incentives
Public transit investments to expand service and increase passenger miles traveled

Expand and modernize anaerobic digestion at wastewater treatment
Expand Wastewater CHP
Develop Local Micro-Grids for Critical Infrastructure
Round-It-Up Utilities Efficiency Program
Water Efficiency Bulk Purchasing
Energy Storage Bulk Purchasing
Develop and Deploy Smart Grids and/or Meters
Electric Vehicle (EV) Battery Reuse
Clean Energy Conservation and Incentives
Education Programming
Solar Energy Purchase Agreement (PV PPA)

Buildings & Energy Input:

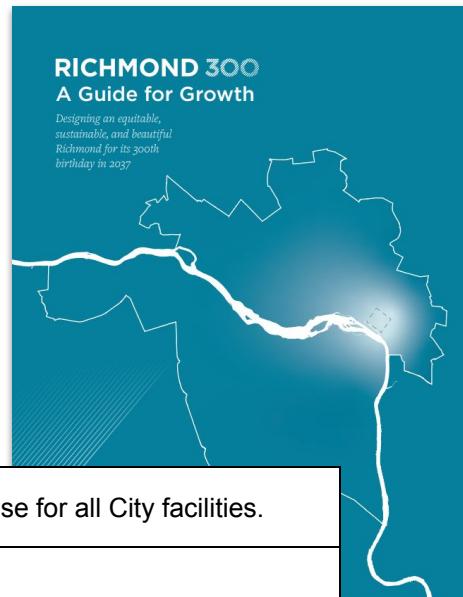
CAAP Strategy Examples from other cities...



Austin	Provide cash incentives to owners, developers and property managers of multifamily properties for making energy efficiency upgrades and for Solar PV and water heat
Baltimore	Living Classrooms Foundation is installing resilient solar in Baltimore community centers and training local residents to become certified solar installers
Berkeley	Solar installations for low-income communities
Boston	Battery, thermal, and demand response to reduce peak demand and time of use costs; commercial focus
Chicago	Incentivize deconstruction (taking buildings apart and reuse/recycle remaining parts) over recycling in permitting
Oakland	0% interest loans for retrofits to low and moderate income home owners with no upfront cost
Portland	Require energy performance ratings for all homes so that owners, tenants, and prospective buyers can make informed decisions about energy costs and carbon emissions
Providence	New buildings and major renovations should be built to be zero energy ready, meaning they are highly efficient buildings that do not burn fossil fuels on site

Buildings & Energy Input: *Richmond 300 Master Plan*

Richmond 300 Goals & Objectives - *starting point for drafting strategies*



Richmond 300	Conduct an energy audit, publish grades for efficiency, and benchmark energy use for all City facilities.
Richmond 300	Develop an energy management program for City government
Richmond 300	Convert streetlights to LED and/or solar
Richmond 300	Conduct study on local and upstream methane leakage from DPU operations
Richmond 300	Adopt a green building ordinance for municipal facilities
Richmond 300	Encourage industrial facilities to use Combined Heat and Power to generate electricity and thermal energy.

Buildings & Energy Input: *Your ideas from last time!*

Provide incentives for residents/users to use renewable energy (give people a discount on their bills if they subscribe to renewable energy)

Update building energy codes for all new buildings and retrofits to the latest model code.

Require all new municipals to be net zero buildings and require all existing municipal buildings to craft a pathway to becoming net zero

Passive house apartment buildings

Drafting Process - *Strategies*

Buildings &
Energy Inputs

Technical Information

Climate and Energy Modeling
Climate Vulnerability & Risk Assessment

Policy Inputs

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Examples from other cities

Today's activity

Starting Point for

Strategies

Richmond 300 Master Plan
Your ideas from last time



Your task today: drafting strategies

Preliminary checklist for strategies:

- Does it *reduce greenhouse gas emissions* *or increase resilience to climate change*?
- Is it equitable? (we will dive deeper into the equity tool at the next meeting)



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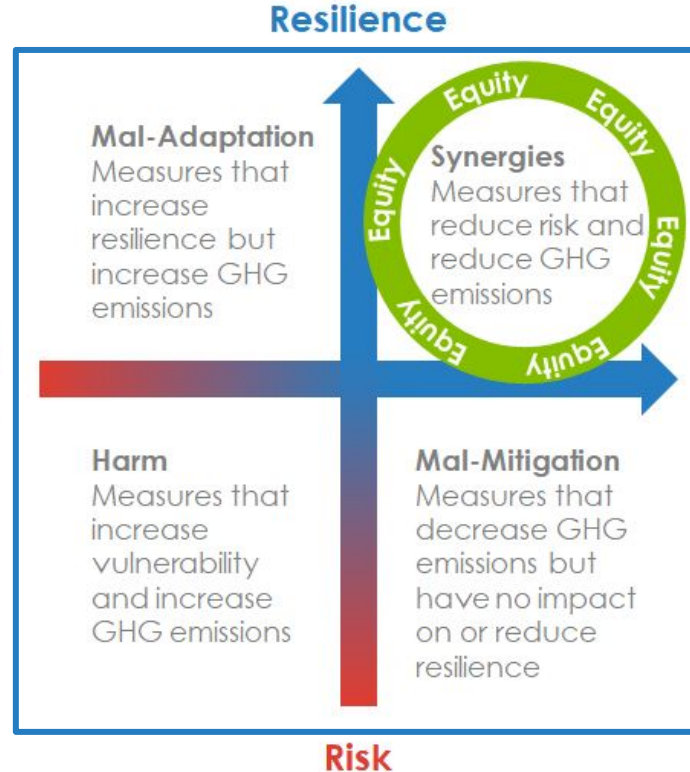
Implementation
Plans

RVAgreen 2050 Nexus

Mal-Adaptation example:

Increasing fossil-fuel based air conditioning to cool homes

High GHG Emissions



Synergy examples:

- Distributing energy supply across multiple renewable sources
- Improving efficiency of water distribution
- **Others?**

Mal-Mitigation example:

Increasing density (and paved surfaces) without providing for trees, green space, etc.

Activity

- Divide into 4 breakout rooms
- Facilitators will switch between rooms to guide discussion on strategies within one of the draft objectives
 - Objective 1: Dawn
 - Objective 2 : David
 - Objective 3 : Irina
 - Objective 4: Wendy
- Take 15 minutes per objective (~4-5 mins. per strategy bucket) to:
 - Review refined draft objectives
 - Draft strategies

Strategy rules for today:

- MUST reduce GHGs and/or increase resilience
- MUST be equitable

If it doesn't follow the rules, don't write it down!



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Activity Example

Objective #1: Achieve climate neutrality and increase resilience in government buildings, infrastructure, and operations.

Strategy bucket: Energy Efficiency

Conduct an energy audit, publish grades for efficiency, and benchmark energy use for all City facilities. Implement programs to improve the energy efficiency of City-owned buildings

Convert streetlights to LED and/or solar

Develop an energy management program for City government

Implement energy retrofits and other energy initiatives in the Clean Air Goal of Richmond 300 to reduce greenhouse gas emissions and energy consumption


Benchmark energy use of existing buildings; identify low performing buildings that should be prioritized, provide baseline to improve upon and show any progress that is being made


Strategy rules:

- MUST reduce GHGs and/or increase resilience
- MUST be equitable (we'll discuss in more detail next time)

If it doesn't follow the rules, don't write it down!

 = Richmond 300

 = ideas from our last meeting

 = your new ideas!



5-minute break

*Go into breakout
rooms!*

Objective #1 - Dawn

Achieve climate neutrality and increase resilience in government buildings, infrastructure, and operations

Objective #1: Achieve climate neutrality and increase resilience in government buildings, infrastructure, and operations.


Strategy bucket: Energy Efficiency


Strategy rules:

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- MUST be equitable (we'll discuss in more detail next time)

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Conduct an energy audit, publish grades for efficiency, and benchmark energy use for all City facilities. Implement programs to improve the energy efficiency of City-owned buildings

Implement energy retrofits and other energy initiatives in the Clean Air Goal of Richmond 300 to reduce greenhouse gas emissions and energy consumption

Benchmark energy use of existing buildings; identify low performing buildings that should be prioritized, provide baseline to improve upon and show any progress that is being made

Create a building energy code for city that is bold, but achievable; technically accurate but understandable by a 5th grader.

Take advantage of Energy Performance Contracting

Create Energy Manager position (this position should be given authority in such a manner that many of the "bureaucracy" barricades towards any city project are reduced)(position must eliminate obstacles not become just another one)

Fund massive retrofits today. Don't forget to fund training staff in O&M to ensure systems operate as designed. These investments often will pay for themselves quickly.

Have Energy Manager report directly to mayor and council so that things actually get done. This has to be treated like the emergency it is.

Just do it. Start fixing buildings. Invest in the knowledge and training of maintenance (and all) staff so that they appreciate EE goals, strategies, and available tools. Close windows, program thermostats, fix leaks, seal ducts.

Ensure energy efficiency is a part of the design of all new capital projects.

Train building code officials to review Manual J and Manual D submissions.







Direct building code officials to require blower door tests today (they can ask for any test they like) and to request duct leakage testing data from installers for all new dwelling units.



Strategy bucket: Climate Neutrality



diagnosis.  

diagnosis.  





electric   




- MUST reduce GHGs and/or increase resilience
- MUST be equitable (we'll discuss in more detail next time)

If it doesn't follow the rules, don't write it down!



 = ideas from our last meeting

 = your new ideas!






Objective #1: Achieve climate neutrality and increase resilience in government buildings, infrastructure, and operations

Strategy bucket: Resilience Measures

Strategy rules:

- MUST reduce GHGs and/or increase resilience
- MUST be equitable (we'll discuss in more detail next time)

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-  = your new ideas!

Incorporate climate projections into land use, building regulations, and capital investment

Implement green infrastructure measures and other measures outlined in RVA H20 Plan and in the Clean Water Goal of Richmond 300 to improve water quality and reduce stormwater runoff

Establish assessment guidelines for public infrastructure that ensure resilience to current and future hazards.

Regular building "check ups" to identify issues before it is too late.

Bury utilities underground along all Great Streets and bury utilities underground where possible on all other streets (What is a great street?)

Relocate overhead utilities to alleys or bury overhead utilities to accommodate mature canopy street tree planting

Make all new buildings net zero and develop/begin implementing plans for existing building to get as close to net zero as possible as soon as possible.

Use stormwater fees to fund resilience projects.



Objective #2 - David
*Maximize energy efficiency,
performance and resilience in all
existing buildings*

Objective #2: Maximize energy efficiency, performance and resilience in all existing buildings

Strategy bucket: Building code, zoning and permitting

Strategy rules:

- MUST reduce GHGs and/or increase resilience
- MUST be equitable (we'll discuss in more detail next time)

If it doesn't follow the rules, don't write it down!

-  = Richmond 300
-  = ideas from our last meeting
-  = your new ideas!

Create flexibility in the Zoning Ordinance to encourage the adaptive reuse of historical buildings and deter demolition, such as allowing for compatible densities and uses in historical areas (e.g., reduce parking requirements for historical institutional buildings that are changing uses).

Advocate in the General Assembly to amend the statewide uniform building code to require greater energy efficiency

Update building energy codes for all new buildings and retrofits to the latest model code.

Install metrics to measure efficiency improvements.

Refrigerant management program to reduce GHGs and phase out HFCs

Develop guide for high-performance / net zero energy new construction and historic retrofits to encourage green construction practices.

Instead of develop guide (as in the slide to the left) the "guide" should be a set of requirements that must be met at the time of construction

Work with allies around the state to have Virginia adopt the 2021 IECC now.

Work with allies around the state to lay out a timeline by which our building energy code shall require all new buildings to be net-zero.

Codes and incentives to require that current fossil fuel dependent systems are only replaced with electric ones

Vigorously enforce letter and spirit of current building code: Train plan reviewers to scrutinize Manual J and Manual D submissions. Advise inspectors to request blower door tests to verify that dwelling units meet the 5ACH threshold. Ensure that HVAC contractors submitting assurances of duct leakage compliance have real numbers. Trust but verify!



Objective #2: Maximize energy efficiency, performance and resilience in all existing buildings

Strategy bucket: Energy efficiency financing & incentives

Increase education/promotion of existing programs and expand programs to aid homeowners in implementing energy efficiency and stormwater upgrades, including establishing a Residential PACE (Property Assessed Clean Energy) program

Create a Commercial Property Assessed Clean Energy (CPACE) program

Advocate in the General Assembly for enabling legislation allowing jurisdictions to: Adopt residential PACE programs; Require energy benchmarking and public disclosure, and adopt local ordinance

Fund home repair and energy efficiency programs to assist individuals with deferred maintenance

Incentivize energy performance/efficiency improvements via utility programs, clean energy financing, etc.

Need to make sure language includes all residents & businesses to be equitable and obtainable financially

Improved life experience through improved energy performance

*From the Community Working Group:
Consider figuring out payment plans with contractors-- would it be more feasible if owners of existing buildings could pay say, \$30/month for improvements?*

Richmond gas can offer various on-bill financing programs for customer investment in EE.

Strategy rules:

- MUST reduce GHGs and/or increase resilience
- MUST be equitable (we'll discuss in more detail next time)

If it doesn't follow the rules, don't write it down!

*From the Community Working Group:
Ensure that taxes/fees to make improvements are also equitable-- money and resources/knowledge shouldn't be a barrier.- provide funding and outreach.*

Institute a green revolving fund to incentivize retrofits in city-owned buildings with start-up money from RGFI, state, or federal EE sources.

-  = Richmond 300
-  = ideas from our last meeting
-  = your new ideas!

Payment options for heat island residents



Objective #2: Maximize energy efficiency, performance and resilience in all existing buildings


Strategy bucket: Existing building benchmarking & retrofits


Strategy rules:

- MUST reduce GHGs and/or increase resilience
- MUST be equitable (we'll discuss in more detail next time)


If it doesn't follow the rules, don't write it down!

 = Richmond 300

 = ideas from our last meeting


 = your new ideas!

Develop a comprehensive 'green business' program, similar to that of Montgomery County, Maryland or the Loudoun County, Virginia Green Business Challenge





Work with local providers to market energy retrofit programs for low-income individuals 

Create programs that improve performance in undesirable areas for redevelopment.


Toward net zero buildings and percentage benchmarks/milestones


From the Community Working Group: Make sure timeline is equitable-- owners of rentals are often reluctant to make improvements. Share resources and support to homeowners and rentals, and make sure that rental owners aren't able to delay implementation more than other types of property owners. 

Some of the green papers can be consolidated into one benchmarking item

Start vigorously promoting energy audits and retrofits today - using all available resources. Advocate for additional resources from the GA and via utility regulation. 



Encourage industrial facilities to use Combined Heat and Power to generate electricity and thermal energy.

Establish action benchmarks (i.e. low-hanging fruit in the immediate future and think outside the box for big picture future improvement) 

Establish baseline of all existing buildings in order to improve energy performance through energy audits and retrofits. 


Create energy performance benchmark, standards, tracking, and reporting system and make publicly available

What about water conservation? 

Replace the natural gas & heating oil currently used to heat space and hot water with GHG-free electricity 

Ensure that resilience is defined/referenced in the report

0% loan for retrofits in commercial and residential properties.

Benchmarking (before and after retrofits) and ongoing measuring/tracking 

Incorporate LEED energy performance language to align






Objective #2: Maximize energy efficiency, performance and resilience in all existing buildings

Strategy bucket: Existing building resilience strategies

Strategy rules:

- MUST reduce GHGs and/or increase resilience
- MUST be equitable (we'll discuss in more detail next time)

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-  = your new ideas!

Consider equity-thermal comfort and safety? High performance buildings? Human experience? Quality of life?

Increasing energy efficiency increases passive survivability of the building and reduces carbon output. Start vigorously promoting energy audits and retrofits today - using all available resources (like local agencies that provide these services, often using utility rebates).

Advocate for additional resources for EE upgrades from the GA and via utility regulation.

Advocate for changes to VA building code to require more efficiency in existing buildings.

Buildings over 20K sq ft hire energy managers mandatory consistant code compliance



Objective #3 - Irina
*Ensure all Richmonders have
equitable access to affordable
and resilient renewable energy*



Objective #3: Ensure all Richmonders have equitable access to affordable and resilient renewable energy




Strategy bucket: Renewable Energy Financing & Incentives




Strategy rules:
- MUST reduce GHGs and/or increase resilience
- MUST be equitable (we'll discuss in more detail next time)




If it doesn't follow the rules, don't write it down!


-  = Richmond 300
-  = ideas from our last meeting
-  = your new ideas!



Evaluate the City's tax abatement program to incentivize preservation best practices, energy efficiency, and projects providing affordable housing. 




Evaluate establishing incentives to encourage the installation of solar panels on private buildings, such as matching the [federal 26%] incentive 



Consider a strategy like Baltimore - Neighborhood Sun, where people who subscribe to it get a 5% discount on their bills 


Create solar technician program and weatherization corps to train technicians. Install solar on all city schools and municipal buildings. Weatherize low-income areas at no cost to residents. 



Install microgrids and thermal/battery backup in low-income neighborhoods to increase resiliency and shed peak demand. 

Provide immediate relief to low income residents and/or residents of formerly redlined neighborhoods and heat islands 

Adjust pricing to encourage conservation/ utility bills reflective of use, and ensure there are programs to teach people about water conservation so that low-income families are not burdened with unexpectedly high bills. 

Provide incentives for residents/users to use renewable energy (give people a discount on their bills if they subscribe to renewable energy). 




Strategies can be unique to owners, renters and businesses. 


Provide incentives for strategic electrification (away from natural gas). 

Create fund and strategy to support reduction of urban heat island effect in all redlined neighborhoods. Use RGGI funds to support. 

Provide energy efficiency/auditing/ construction trades apprenticeship programs 

Facilitate development of community solar installations. 

Provide clean-energy financing - like energy performance contracting (ACE) 

Look at HB278 - upgrades to houses --HVAC, solar, etc... to defray costs? 






Objective #3: Ensure all Richmonders have equitable access to affordable and resilient renewable energy

Strategy bucket: Renewable Energy Projects

Strategy rules:

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Ensure lifecycle emissions / waste is considered for solar / battery installation - develop / secure responsible recycling

★ ★ ★ ★ ★

Encourage utilization of solar on brownfield sites (Gas Works, Rockett's Landing)

★ ★ ★ ★ ★

Increase opportunities for local solar and community solar farms on non-buildable land

★ ★ ★ ★ ★

Coordinate development of solar co-ops.

★ ★ ★ ★ ★

Create no-cost training program for solar technicians funded by RGGI. Install solar on local buildings with program graduates at steep discount.

★ ★

Create and maintain a massive education effort with appropriate industry partners to ensure that folks buying new homes or refinancing understand that solar and EE investments included in a mortgage often can be cash positive. Make it a rehab loan and save! (no room on slide 42 for this)

Explore a hydropower PPA for the city. (see [project on Ohio River](#))

★

Support community solar opportunities with buy-in possible for all residents.

★ ★

Install micro hydro on Browns Island for the beer trucks!



Objective #3: Ensure all Richmonders have equitable access to affordable and resilient renewable energy

Strategy bucket: Resilient Energy Sources

Develop micro-grids with on-site energy storage for critical public facilities

Develop microgrid communities with on-site energy storage

Implement ordinance requiring new construction to use all-electric energy (prohibit natural gas lines to new houses)

Ensure that resulting strategies are additive to existing policies

Support increased usage of energy storage technology, including small-scale storage systems in residential, commercial, and industrial buildings, vehicle-to-grid infrastructure, and larger stand-alone storage facilities where appropriate

Continuous monitoring of Richmond's energy sources to ensure that it is resilient and clean.

Concern about already overburdened communities losing greenspace to solar developments (incorporate into code - Residential areas need access to x amount of green space or you can't build solar developments where important canopy cover will be lost.

Add language to green slide, not just additive to existing policies, but replacing when necessary and appropriate

Strategy rules:
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Objective #4 - Wendy
*Achieve climate-neutrality and
maximize resilience in all new
buildings*

Objective #4: Achieve climate-neutrality and maximize resilience in all new buildings

Strategy bucket: Building code, zoning, and permitting

Advocate in the General Assembly to amend the statewide uniform building code to require greater energy efficiency

Evaluate creating legislation to require stronger energy-efficiency and green-building standards of developers requesting zoning variance and/or site plan approvals.

Review existing zoning and policy for impediments to renewable energy and revise them to reduce barriers

Create a cross-functional team including PDR, members of the development community, and energy professionals to create a streamlined overview and approval process that certifies buildings as net-zero.

Equitable development means building up through higher density.

Update building energy codes for all new buildings and retrofits to the latest model code

Create legislation to require stronger energy-efficiency and green-building standards of developers requesting zoning variance and/or site plan approvals.

Clarity on “equitable development means building up through higher density”

Add Special Use Permits to the middle blue sheet.

The administrative chapter of the building code allows an inspector to request any appropriate test. Start asking for blower door testing of new dwelling units today.

Strategy rules:
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- MUST be equitable (we'll discuss in more detail next time)

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-  = your new ideas!



Objective #4: Achieve climate-neutrality and maximize resilience in all new buildings

Strategy bucket: Green building strategies

Identify opportunities for green roofs on public facilities, and encourage green roofs in private development

Develop guide for high-performance / net zero energy new construction and historic retrofits to encourage green construction practices.

Identify the barriers that keep builders from doing this (i.e. lack of knowledge, lack of commitment, education)

Passive house apartment building

Create green buildings standards (i.e. green building and net zero are not the same thing so need to include both)




Recognize the importance of embodied carbon in existing buildings by renovating instead of building new.

Passive standards for commercial buildings

Provide public outreach/education, etc to overcome the barriers identified on the green builder note

Strategy rules:
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- MUST be equitable (we'll discuss in more detail next time)

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Objective #4: Achieve climate-neutrality and maximize resilience in all new buildings

Strategy bucket: Resilient building strategies

Strategy rules:

- MUST reduce GHGs and/or increase resilience
- MUST be equitable (we'll discuss in more detail next time)

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On development sites that encompass most of a city block or block frontage, require multiple buildings and/or façade articulation to increase visual interest, require massing that is responsive to the human-scale, and consider pedestrian through-block connections through existing super blocks to establish a street grid.

Design neighborhoods with a variation in building heights to encourage air circulation.

Increase building permeability by requiring new buildings to have functioning entrances from the sidewalk and restricting blank walls at ground level.

Require the screening of utilities, communication, transformers, and other service connections to buildings.

From the Community Working Group: Does comfort fall within resilience? Ensuring adequate ventilation and health (improved air quality?) Consider education about these issues as well!

“Increase building permeability...” doesn't really seem relevant to our vision

Isn't that the opposite of passive housing?

Encourage more battery storage capacity to mitigate unanticipated energy surges due to extreme weather. Sometimes batteries' grid-service benefits can finance this.

Maximizing EE increases passive survivability. So just work towards net-zero for everything. Fund it! Do it!

Who funds it?

Ensure emergency power sources are climate neutral equipment



Objective #4: Achieve climate-neutrality and maximize resilience in all new buildings

Strategy bucket: Financing, Incentives & Barriers

Engage local professional expertise to develop incentives and/or other components of a robust Green Building program

Identify funding, opportunities, and incentives to make this achievable.

Identify the benchmarks and strategies to get there.

Identify the penalties that create barriers (e.g. money, time, administrative demands)




From the Community Working Group: define climate-neutrality...not everyone knows what that means (education is key)

Offer a commercial (and residential) PACE program (property assessed clean energy)

RGGI funding

Strategy rules:
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*Strategies that may not
fit in these objectives*

Strategies that may not fit within the current draft objectives

Strategy rules:

- MUST reduce GHGs and/or increase resilience
- MUST be equitable (we'll discuss in more detail next time)

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Exit breakout rooms

Wrap-up and next steps

- Homework: Continue adding ideas to these slides until Feb. 22
- Next meeting: Wednesday, March 3, 11:00 - 1:00
- NOW:
 - Fill out feedback survey
 - Share updates, upcoming events, and resources in the chat

Buildings & Energy Input: Community Priorities

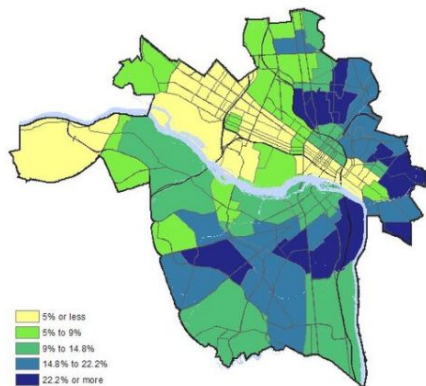
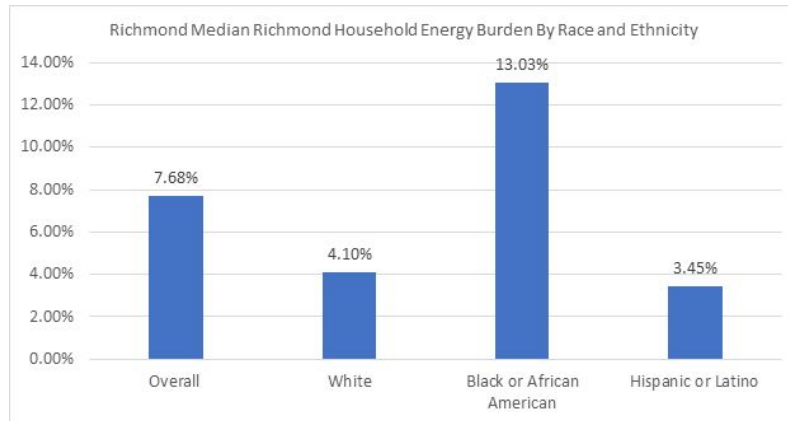


Housing & Buildings

Affordable Housing, Energy Burden, and Race/Ethnicity

Energy burden is a known contributing factor to evictions

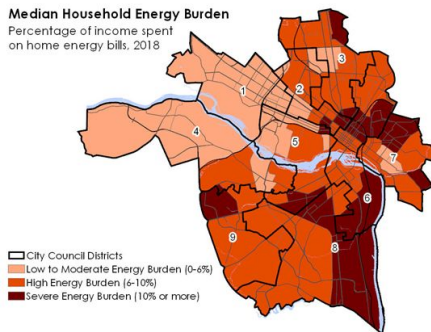
- US median household energy burden across 48 largest cities = 3.5%; Richmond = 7.7%
- Low-income, Black, and Hispanic or Latino households pay a much larger share of their income on energy bills



Median household energy burden:

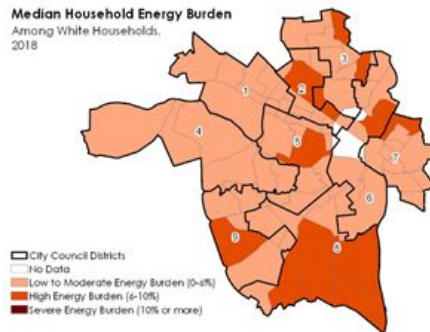
All households

Median Household Energy Burden
Percentage of income spent
on home energy bills, 2018



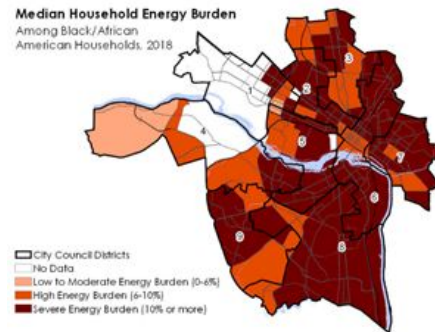
White Households

Median Household Energy Burden
Among White Households,
2018



Black/African American Households

Median Household Energy Burden
Among Black/African
American Households, 2018



Buildings & Energy Input: Community Priorities

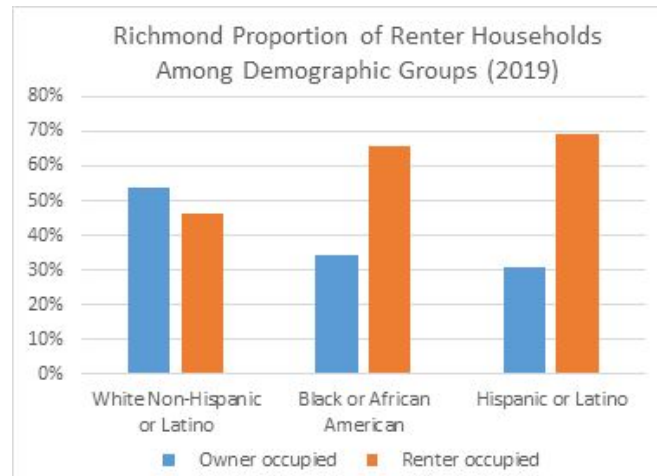


Housing & Buildings

Affordable Housing, Energy Burden, and Race/Ethnicity

Energy burden is a known contributing factor to evictions

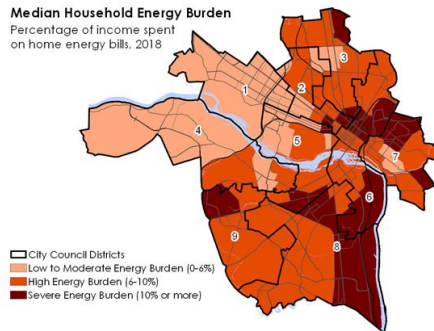
- Renters are more likely to have a higher energy burden than homeowners
- Black and Hispanic or Latino households are less likely to own their homes than white households
- Low-income, Black, and Hispanic or Latino renter households pay a much larger share of their income on energy bills



Median household energy burden:

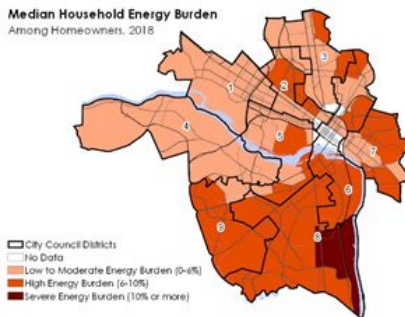
All households

Median Household Energy Burden
Percentage of income spent
on home energy bills, 2018



Homeowner Households

Median Household Energy Burden
Among Homeowners, 2018



Renter Households

Median Household Energy Burden
Among Renters, 2018

