

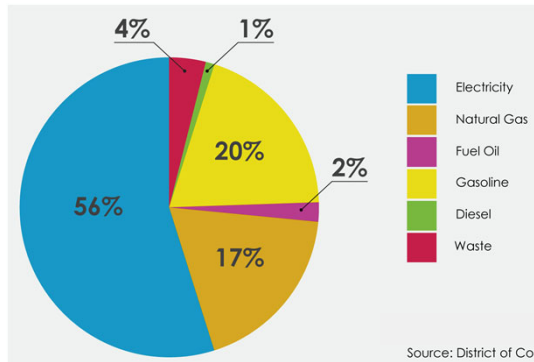
# DC NET-ZERO ENERGY Elective Program Development

Bryan Bomer  
Green Building Program Analyst

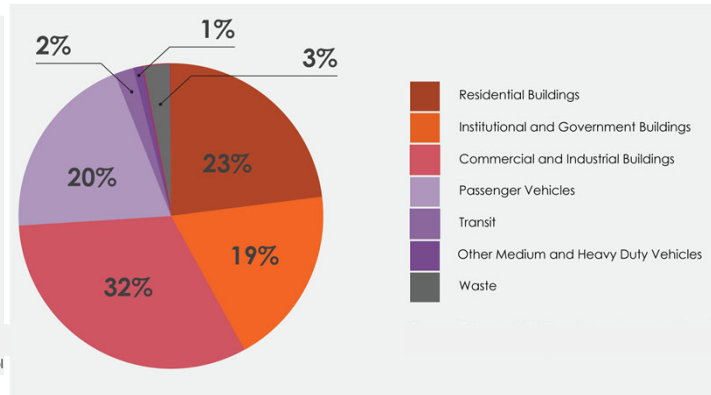


## ENERGY USE AND EMISSIONS IN DC

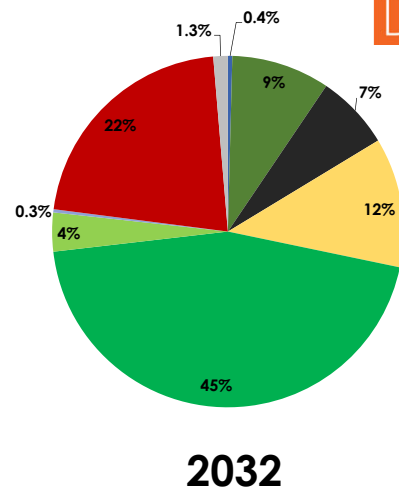
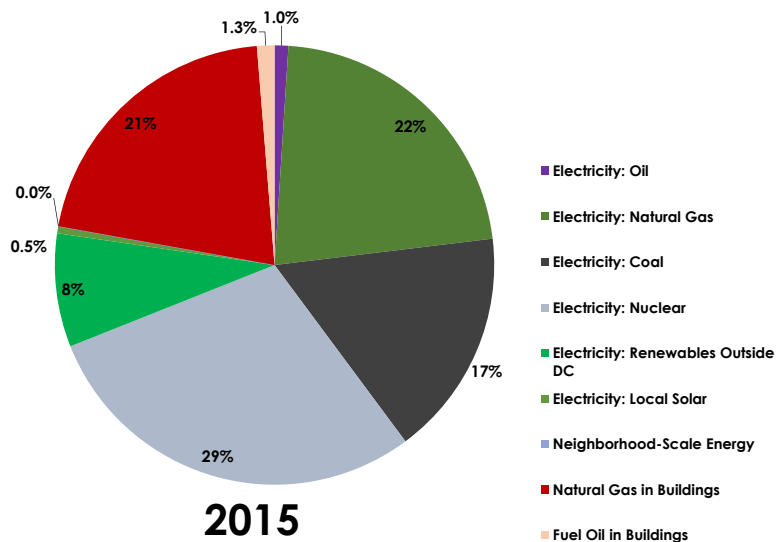
**PROPORTION OF GHG EMISSIONS BY SOURCE**

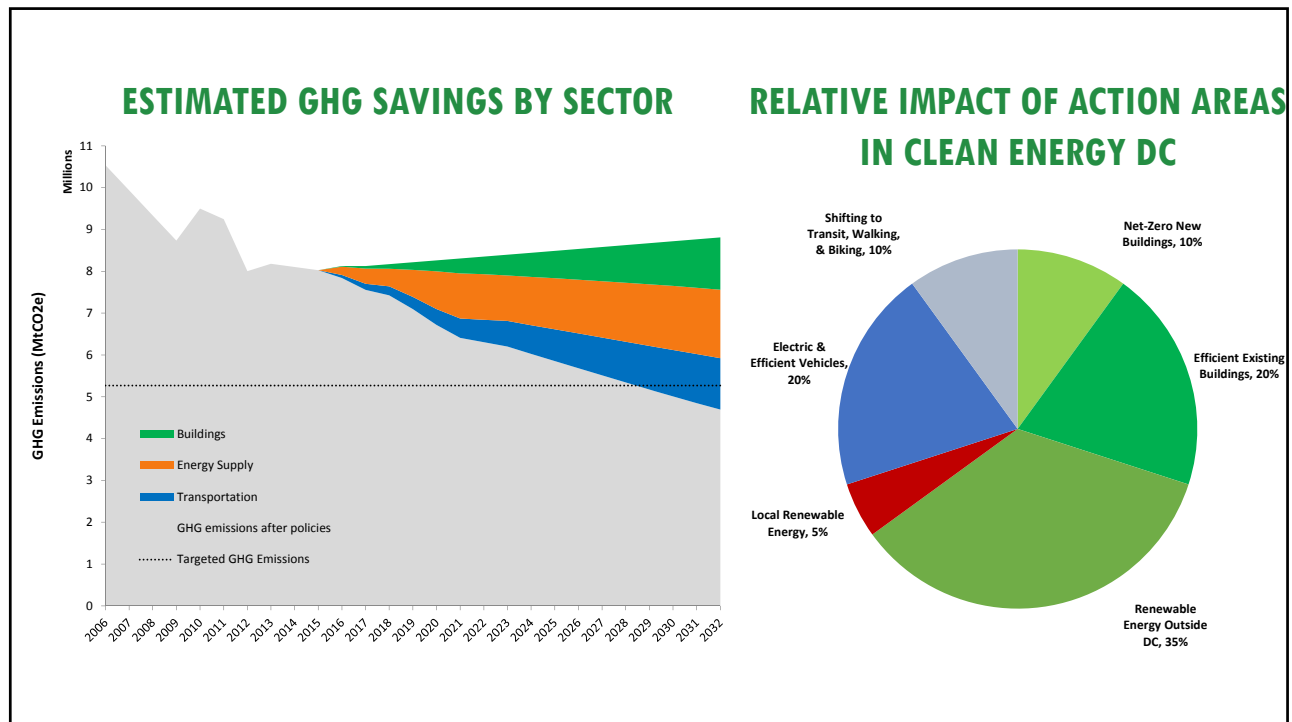


**MODELED PROPORTION OF GHG EMISSIONS BY SECTOR**



## BUILDING SECTOR SOURCE ENERGY MIX





## NET-ZERO ENERGY CONSTRUCTION

- Residential new construction – 2022
- Commercial requirements – 2026
- Proposed DC 2018 Energy Code includes Appendix Z: Net-Zero Pathway
- DC easing the path for adoption
  - Solar + Stormwater
  - Zoning regulations
  - Permitting
- District Energy & Microgrids



## DISTRICT GOALS, PLANS, REGS & PROGRAMS

### REGULATIONS & PROGRAMS

- New construction
  - Mandatory Net-Zero Energy Codes targeted for...
    - Residential by 2022
    - Commercial by 2026
  - Voluntary NZE Program
    - Commercial: Appendix Z & Alternative Compliance Pathways
    - Residential: DCRA NZE Program & Alternative Compliance Pathways
  - Green Building Act & DC Green Construction Code (10,000 SF +)
    - 2018 IgCC review & adoption required under Sustainable DC 2.0
- Existing Buildings
  - Building Energy Performance Standard (Clean Energy DC Omnibus Act)
  - 100% RPS by 2032
  - Energy Benchmarking step-down to 10,000 SF+

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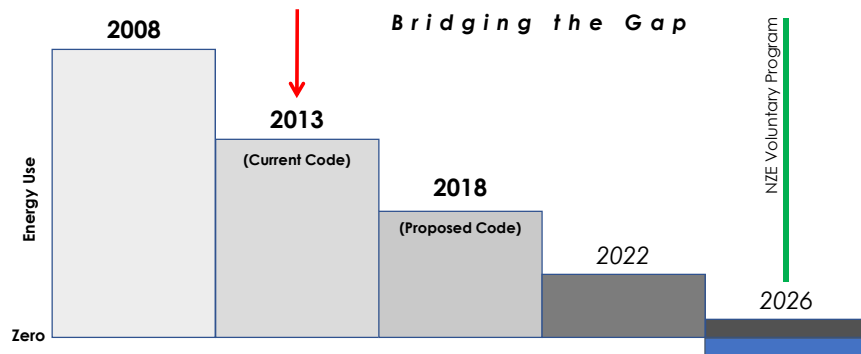
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## THE PATH TO NET-ZERO ENERGY BUILDINGS



Net-Zero Energy Code requirements per **Clean Energy DC Plan & Sustainable DC 2.0**

- **2026** Net-Zero Commercial Energy Code / **2022** Net-Zero Residential Energy Code

DCRA is working with project teams interested in being early NZE adopters

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## NET-ZERO ENERGY VOLUNTARY PROGRAM PATHWAYS COMMERCIAL

- DCRA NZE Pathway (Appendix Z)
  - Design, construction, and outcome based NZE Code
- Appendix Z basics:
  - Meet a ZEPI of 30 using equation **ZEPI = 50.4 (EUIp/EUI)**
  - Calculated in accordance with Appendix G to ASHRAE 90.1-2016
  - Meet maximum annual heating demand of **4.2 kBtu/ft<sup>2</sup>**
  - Meet maximum annual cooling demand of **6.4 kBtu/ft<sup>2</sup>**
  - Building **Commissioning** of building envelope, airtightness testing, HVAC, lighting, DHW, renewable systems
  - **No on-site combustion** allowed
  - Renewables: Minimal on-site + off-site (with specific guidance)
  - Metering and energy benchmarking
  - Performance **verification** within 24 months
- Alternative Compliance Pathways (Commercial)
  - LBC Energy Petal, ILFI Zero Energy Building, [PHIUS+, PHI, or DOE NZE-Ready + solar], LEED Zero Energy, LEED Zero Carbon

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## ALTERNATIVE COMPLIANCE PATHWAYS

**101.10.6 Alternative Compliance Paths for Commercial Building Projects.** In lieu of the requirements of the *Energy Conservation Code-Commercial Provisions*, commercial building projects that comply with one of the alternative compliance paths set forth in Sections 101.10.6.1 through 101.10.6.7 shall be deemed to comply with the *Energy Conservation Code-Commercial Provisions*.

**101.10.6.1 Appendix Z.** Demonstrate compliance with all sections of Appendix Z with the exception of Z5.2 of the *Energy Conservation Code-Commercial Provisions*.

**101.10.6.2 Compliance Utilizing ILFI Living Building Challenge.** Design, construct and certify to the International Living Future Institute's Living Building Challenge program for either full Living Building Challenge or Energy Petal certification. The owner shall provide documentation to the *code official* confirming registration with the Living Building Challenge program prior to permit issuance. The owner shall have an 18-month period from the date of issuance of the first certificate of occupancy, or from approval of the final inspection, to submit official evidence of certification to the *code official*. The *code official*, for good cause and upon written request, is authorized to extend the period to submit evidence of certification.

**101.10.6.3 Compliance Utilizing ILFI Zero Energy Building.** Design, construct and certify to the International Living Future Institute's Net Zero Energy Building Certification. The owner shall provide documentation to the *code official*

## NET-ZERO ENERGY VOLUNTARY PROGRAM PATHWAYS RESIDENTIAL

- DCRA NZE Residential Energy **Calculator**
  - Designed for **SF detached, attached, townhomes, small multifamily**
  - Sets a target EUI for the building: **24 kbtu/sf annual or better**
    - As the building increases in stories, the target EUI is lowered
- Alternative Compliance Pathways (residential)
  - LBC Energy Petal, ILFI Zero Energy Building, [PHIUS+, PHI, or DOE NZE-Ready + solar], LEED Zero Energy, LEED Zero Carbon
- Sets an **on-site renewable energy** KW system size
  - Addresses situations where building footprint and number of stories necessitate **off-site renewable energy purchase**
  - Addresses situation where there is shading and on-site solar not an option
- **No combustion** on site

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## NZE VOLUNTARY PROGRAMS

### Program

- Net-Zero Energy Program for all buildings types
- Administered by Building Department (DCRA Green Building Division)

### Outreach

- Branding/marketing Development
- NZE Regional Coalition

### Green Ambassador Program

- Two-part incentive program designed to encourage and assist early adopters

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## NZE DRAFT: GREEN AMBASSADOR INCENTIVE PROGRAM PHASE I

Design   Plan Review*	Post Occupancy
<ul style="list-style-type: none"> <li>• Accelerated Permitting</li> <li>• Technical Assistance</li> <li>• Financing (Green Bank, DC PACE)</li> </ul>	<ul style="list-style-type: none"> <li>• Pay-for-Performance</li> <li>• Case Studies and Professional Directory</li> <li>• Technical Assistance</li> </ul>

\*Additional incentives for high-impact projects (affordable housing, schools)

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## GREEN BUILDING DIVISION

- **Plan review** and permitting
- Green/energy **Inspections**
- Post-occupancy data & tracking
- Policy & **code** development
- **Solar** and other green tech
- Community **outreach & education**
- **Technical assistance** to building industry
- **Net-Zero Energy** Assistance

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