

Meeting the 2030 Challenge

Reducing Greenhouse Gas Emissions

A report developed at the request of the City of Richmond by individuals and statewide organizations — public and private — committed to Richmond's future

June 27, 2007

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Conclusions

As one participant stated, today's marketplace is "green." Such a broad pronouncement encompasses many concerns including energy efficiency, indoor-air quality, water and land conservation and climate change. And, as publications as diverse as *National Geographic*, *Newsweek*, *Sports Illustrated* and *Glamour* attest, the world is undergoing climate change.

A tipping point has occurred where students are adding it to their list of criteria when choosing colleges. Employees are demanding it in their work places. Families with members who have respiratory allergies or ailments require it in their homes, work places and public schools. Many major manufacturerers now offer "green" products in response to this cultural shift in consumer demands.

Financial institutions are providing attractive interest rates to building owners who specify energy-efficient construction methods and materials. Virginia localities are eligible for similar incentives for public buildings through the VML/VACo Finance Program. The Energy Policy Act of 2005 offers tax credits for a wide array of energy-efficient elements of buildings and for buying alternative-fuel and flex-fuel vehicles.

With Mayor Wilder's actions in 2006, Richmond has positioned itself among the leading cities of the world that believe in a new economy based on sustainability. This means that for potential employers, for future residents and for its current population the city will make itself a healthier, more energy-conscientious community and part of the founding members in a new marketplace based on energy independence and stewardship.

The 2030 Challenge initiative endorsed by acclamation in 2006 by the nation's mayors, including Wilder and five others from Virginia, aims to address climate change by reducing greenhouse gas emissions. Almost half of these emissions have been traced to buildings and building construction.

The participants of the meetings held at the Virginia Center for Architecture in Richmond developed general suggestions to present to the city and specific ideas within each suggestion to be used as a structural framework for achieving the goals of the 2030 Challenge. These suggestions will be offered as starting points for the other municipalities in Virginia whose mayors supported the 2030 Challenge. By partnering with the Virginia Municipal League and the Virginia Association of Counties, the participants will make this a statewide initiative.

Some of the ideas can be implemented today. Others might need to wait. Some cities, because of their resources or specific needs, might choose different strategies than their neighbors. All are intended to be recommendations. It is up to the cities' leaders to choose the ones that make the most sense for their situation or to modify them to fit their particular needs.

To advance the ideas from these meetings, all participants including those from Maggie L. Walker Governor's School for Government & International Studies indicated a strong desire to work with the city, the VSAIA and any other organizations on a continuing basis as these ideas are explored, developed, refined and implemented.

Summary

The five constituent groups invited to participate in the meetings March 30 and June 5 agreed on these major ideas:

1. Revise the city's master plan, incorporating defined environmental policies within the city's plan for future development
2. Establish a baseline and methodology for estimating and measuring the energy usage of all building types in the metro-region and for measuring greenhouse gases associated with such energy use
3. Establish an energy manager position or management team with the authority and independence to effect change in the community. The city's energy manager would have authority over all aspects of the implementation of Richmond's program. Note that this position would not have any involvement in the energy performance of city-owned buildings, but rather the development, adoption and implementation of the overall program points discussed in this document, and for developing the market toward adoption of the program.
4. Institute incentives for designs and programs that reduce energy use or provide energy through renewable resources
5. Develop and implement an educational program that would enhance the possibility of a cultural shift among decision makers in the political, business, educational and non-profit communities as well as citizens of the region
6. Adopt a sustainable/energy efficient/green building program to establish standards for new and renovated structures

7. Investigate opportunities offered through the re-regulation of the utility industry; innovative collaboration of educational, business, non-profit and governmental entities; and other avenues as they arise
8. Adjust auditing procedures to allow operating-budget savings realized through energy-efficient design to offset capital-budget expenses for initial construction or renovations
9. Market Richmond's green qualities and aspirations to current and future residents and businesses by partnering with all local marketing entities such as Venture Richmond and news entities to ensure that Richmond's commitment to carbon neutrality is leveraged by every marketing avenue available

Methodology

Architects convened the meetings for the Richmond government, but it was the participants themselves — including architects — who offered the expert ideas to the city.

The participants were divided among five groups: Energy, Finance, Government, Housing, and Industry. Energy was led by Tommy Thompson, an energy manager in the Virginia Department of Mines, Minerals and Energy. It is this agency that has been entrusted with the responsibility for implementing the Energy Policy Act, adopted in 2006 by the Virginia General Assembly.

Finance was led by Raymond Owens of the Federal Reserve Bank and Steven Lowrie of Money Management Systems. Government was led by Duncan Abernathy, the director of government and industry affairs for the VSAIA. Housing was led by Chris Lowrie, the executive director of Housing Virginia. Industry was led by Michael Pellis, an architect with Baskervill's Richmond office.

Those participating reflect a who's who among statewide organizations and government entities. All of the participants are listed in Appendix II. They were segregated by occupation or agency into the five single-focus groups.

For the first meeting, each group developed recommendations for the city to review. At the end of the first meeting, while listing the recommendations and perceived obstacles, it became apparent that the suggestions from one group overlapped ideas in one or more others. This led to the second meeting in which the finance group was the only one retaining its single focus. (Its members concentrated on writing a statement that could be used as a grant request for Community Reinvestment Act funds. This is still in

process.)

To address the obstacles or challenges identified in the first meeting, the government group participants joined the other three — Housing, Energy and Industry — and the other participants were randomly divided among those three groups as well. In this way there were experts from each area of investigation to identify possible solutions to the perceived obstacles. The goal of these sessions was to develop a framework for implementation of the recommended programs. A consensus was reached that one entity should oversee and implement the outlined objectives.

Suggested Actions

We have divided the major themes identified in the summary into an outline. It is our intent that this detail provide some background for the city to be able to set its own priorities in selecting the ideas to implement the goals of the 2030 Challenge.

- I. Master plan –
 - A. The first item identified by the city to address its goals for the 2030 Challenge was a revised master plan. The goal is to have the city's policies regarding sustainability and energy efficiency come alive in the planning documents. Included in this plan would be areas identified for Community Reinvestment Act grants, which would be available for people wanting to improve their buildings' energy efficiency.
 - B. In cooperation with GRTC, work with VCU, Virginia Department of General Services and other major employers within the city to create nodal transportation opportunities that provide more efficient commuting and intracity travel options. Expand transportation options throughout city.
 - C. Set date for implementation with intermediate dates for public comment
- II. Emissions baseline — This has been instituted nationwide through a climate registry (<http://www.theclimateregistry.org/>) that began with 31 states and to which Gov. Timothy Kaine added Virginia's name in May 2007.
 - A. Use energy-consumption baselines already developed by the U.S. Green Building Council and the Environmental Protection Agency for average consumption by building type
 - B. Begin adding data into the database being developed by the climate registry
 - C. Follow existing formats to begin developing a Richmond-specific baseline. Compare and contrast with national/regional baselines.

- D. Set date for implementation with annual public reviews after that date
- III. Energy manager — Through Executive Order # 48 in 2007 (http://www.governor.virginia.gov/initiatives/ExecutiveOrders/pdf/EO_48.pdf), Governor Kaine established a similar position in most state agencies. This manager's responsibility is to reduce energy obtained through non-renewable fuels to 20 percent below 2006 usage by the year 2010.
- A. Position to be filled by a professional or group of consultant professionals as opposed to an appointee
 - B. Set date for position advertisement with projected hiring date/contract start date
 - C. *Audit city facilities to identify energy-saving infrastructure improvements. Work with lending organization(s) and third-party provider(s) (to be selected) to develop a self-supporting Energy Savings Performance Contract at no net cost to the city.*
 - D. Authority will encompass all aspects of city's energy policies
 - 1) Education, recognition and information gathering programs with emphasis on auditing existing building stock to determine where greatest improvements can be made
 - 2) Conservation programs
 - 3) Transportation, both alternative fuels for fleet vehicles, for example, and alternative means such as mass transit and bicycles
 - 4) Mandating community design that would foster walkable communities within new developments. Design infill projects and infrastructure changes to minimize necessity for automobiles
 - 5) Collaboration with all major utility users including utility companies, universities, businesses, community partners, churches, and state government.
 - 6) Incentives for developers including density bonuses and expedited permitting processes
 - 7) Zoning or building regulations that focus on implementing renewable energy ideas
 - E. Progress toward carbon-neutral goals will be reviewed annually
- IV. Incentives
- A. Identify aspects of projects or programs that would qualify for incentives
 - 1) Use of renewable sources of energy for electricity or heating
 - 2) Enhanced use of natural daylight in lighting schemes
 - 3) Use of collected rainwater in building systems
 - 4) Innovative control of stormwater
 - 5) Compliance with national, measurable building programs
 - 6) Other incentives for projects or programs that are in keeping with

the goals of the Challenge

- B. List potential incentives available
 - 1) Arlington County, for example, offers density bonuses and floor-area-ratio bonuses to projects that meet LEED standards
 - 2) Expedited permitting and plan review
 - 3) Waivers on related zoning regulations
 - 4) Tax credits as outlined in the Energy Policy Act of 2005
 - 5) Recognition and awards
 - 6) Infrastructure assistance grants
 - 7) Others as appropriate
 - C. Set date for implementing highest-priority incentives with projected dates for implementing subsequent tiers
- V. Educational program
- A. Quote existing and new scientific evidence to verify climate change and identify the effects that can be seen in Richmond and the central Virginia region
 - B. Use existing and develop new materials that teach residents what they can do to reduce greenhouse gas emissions including information about special financing products available for home upgrades, using mass transit, commuting by bicycle, etc.
 - C. Educate large energy consumers to reduce energy use through controlling peak loads
 - D. Use new schools' sustainable characteristics as potential teaching tools for all age groups (National Energy Education Development program in place in several Virginia schools)
 - E. Establish intermediate steps to meet 2030 Challenge goals and publish the progress annually
 - F. Disseminate this information through all media:
 - 1) City's website
 - 2) Richmond-area company newsletters and websites
 - 3) Non-profit organizations newsletters and websites
 - 4) Traditional television and newspaper outlets
 - G. Set date for all programs with public review dates, as necessary
- VI. *Sustainable/energy efficient/green-building* program
- A. Investigate various programs as they relate to energy efficiency (LEED, Rebuild America, EarthCraft Homes, etc.)
 - B. Adopt a program that suits the measurable parameters established by the city's incentives program
 - C. Establish the thresholds under that program that will allow projects to qualify for city incentives for the energy part of the project
 - D. Set dates for implementation

VII. Opportunities

A. Develop transportation alternatives

- 1) Provide more bicycle racks
- 2) Provide striping on pavement for bicycle lanes
- 3) Add bus routes and organize them in an easy-to-use manner. Use successful models as Portland, Oregon, and San Francisco.
- 4) Institute light rail to replace the most-used bus routes

B. Review re-regulation of the utility industry for opportunities to shift current subsidies to renewable energy solutions

C. Participate in developing and supporting legislative measures developed with Virginia Municipal League to implement statewide strategies

- 1) Energy efficiency disclosure for all structures pending sale or resale
- 2) Grants or tax credits for energy-efficient structures or upgrades to structures
- 3) Grants or tax credits for renewable-energy resource development or implementation
- 4) Extending tax credits for energy-efficient appliances
- 5) Encouraging construction within developed areas with existing infrastructure

D. Encourage internships and other educational opportunities for students interested in government, environment, architecture, or related fields of study with Maggie Walker Governor's School, VCU or any other school offering such programs, including those in surrounding counties

E. Continue alternative-fuels investigation and incentives for fleet vehicles (public and private)

F. Continue investigation of capturing methane from wastewater treatment plants and landfills and using it to power electric generators

G. Seek aid from federal sources. Sen. Jim Webb has pledged his support for the Challenge.

H. Investigate the secondary market for investment opportunities such as the Community Reinvestment Act or the idea of auctioning carbon emissions

VIII. Auditing

A. Reconcile territorial difficulties inherent in trying to separate the capital budget process from the operating budget process

B. Allow the savings in the operational budget to offset expenditures in the capital budget when the capital improvements lead to the savings

C. Set an implementation date for accomplishing this

D. Review for effectiveness annually

IX. Marketing

- A. Coordinate efforts in all areas and publicize as many as possible as regularly as possible, especially on inauguration and annual review dates
- B. Compare with the efforts of other cities
- C. Market Richmond's "green" benefits to and then through local, regional and state economic development offices

Appendix I Related resources:

2030 Challenge – www.architecture2030.org

The American Institute of Architects - http://www.aia.org/adv_sustainability

Arlington County – <http://www.arlingtonva.us> (click on "departments," then "environmental services," then "green buildings & energy")

EarthCraft House – www.earthcraftvirginia.org

Environmental Building News –
<https://www.buildinggreen.com/ecommerce/ebn.cfm>

U.S. Department of Energy – <http://www.eere.energy.gov/>

U.S. Green Building Council – <http://www.usgbc.org/>

Virginia Sustainable Buildings Network – <http://www.vsbnet.org/>

Appendix II Text of Resolution 50, U.S. Conference of Mayors, 2006:

ADOPTING THE “2030 CHALLENGE” FOR ALL BUILDINGS

WHEREAS, the U.S. Conference of Mayors has previously adopted strong policy resolutions for cities, communities, and the federal government to take actions to reduce fossil fuel consumption and global warming pollution; and

WHEREAS, the Inter-Governmental Panel on Climate Change (IPCC), the international community’s most respected assemblage of scientists, has found that climate disruption is a reality and that human activities are largely responsible for increasing concentrations of global warming pollution; and

WHEREAS, the U.S. Building Sector has been shown to be the major consumer of fossil fuel and producer of global warming causing greenhouse gases; and

WHEREAS, the federal government through programs fostered within many of its key agencies and numerous state governments as well as municipalities across the U.S. have adopted high performance green building principles; and

WHEREAS, a recent study completed by Lawrence Berkeley National Laboratory, the most definitive cost-benefit analysis of green buildings ever conducted, concluded that the financial benefits of green design are between \$50 and \$70 per square foot, more than 10 times the additional cost associated with building green; and

WHEREAS, the large positive impact on employee productivity and health gains suggests that green building has a cost-effective impact beyond just the utility bill savings; and

WHEREAS, studies have indicated that student attendance and performance is higher in high performance school buildings; and

WHEREAS, recognizing that a building’s initial construction costs represent only 20-30 percent of the building’s entire costs over its 30 to 40 year life, emphasis should be placed on the “life cycle costs” of a public building rather than on solely its initial capital costs; and

WHEREAS, the construction industry in the U.S. represents a significant portion of our economy and a significant portion of the building industry is represented by small business and an increase in sustainable building practices will encourage and promote new and innovative small business development throughout the nation; and

WHEREAS, the American Institute of Architects (AIA), the national professional organization representing architects has adopted a position statement calling for the immediate energy reduction of all new and renovated buildings to one-half the national average for that building type, with increased reductions of 10% every five years so that by the year 2030 all buildings designed will be carbon neutral, meaning they will use no fossil fuel energy.

NOW, THEREFORE, BE IT RESOLVED that the U.S. Conference of Mayors will encourage its members to adopt the following “2030 Challenge” for building performance targets:

New construction of City buildings shall be designed to and achieve a minimum delivered fossil-fuel energy consumption performance standard of one half the U.S. average for that building type as defined by the U.S. Department of Energy. Renovation projects of City buildings shall be designed to and achieve a minimum delivered fossil-fuel energy consumption performance standard of one half the U.S. average for that building type as defined by the U.S. Department of Energy.

All other new construction, renovations, repairs, and replacements of City buildings shall employ cost-effective, energy-efficient, green building practices to the maximum extent possible; and

NOW, THEREFORE, BE IT FURTHER RESOLVED that the U.S. Conference of Mayors will work to increase the fossil-fuel reduction standard for all new buildings to carbon neutral by 2030, in the following increments:

60% in 2010

70% in 2015

80% in 2020

90% in 2025

Carbon-neutral by 2030 (meaning new buildings will use no fossil fuel GHG emitting energy to operate); and

BE IT FURTHER RESOLVED that the U.S. Conference of Mayors will urge mayors from around the nation to join this effort by developing plans to fully implement the above mentioned targets as part of their procurement process and by establishing policies to insure compliance and measure results; and

BE IT FURTHER RESOLVED that the U.S. Conference of Mayors will urge mayors from around the nation to develop plans to fully implement the above mentioned targets for *all* new and renovated buildings within the City; and

BE IT FINALLY RESOLVED that the U.S. Conference of Mayors will work in conjunction with ICLEI Local Governments for Sustainability and other appropriate organizations to join this effort to develop plans to fully implement similar targets as mentioned above.

Appendix III Participants in 2030 Challenge Discussions Held March 30 and June 5, 2007, at the Virginia Center for Architecture in Richmond, Virginia, and via telephone on other dates.

Government	Conaway Haskins	Office of U.S. Senator Jim Webb
	Bert Jones	Va. Division of Engineering and Buildings
	Paula Eubank	Va. Department of Housing and Community Development
	Shea Hollifield	Va. Department of Housing and Community Development
	Bill Dupler	Chesterfield County
	Rachel Flynn	Richmond
	Brian Cox	Richmond
	Brooke Hardin	Richmond
	Kathy Graziano	Richmond
	Christopher Beschler	Richmond
	Larry Land	Virginia Association of Counties
	Bob Lauterberg	Virginia Municipal League/Virginia Association of Counties Finance
	Denise Thompson	Virginia Municipal League
	Jim Boyd	Heyward Boyd Architects PC
	Duncan Abernathy	Virginia Society of the American Institute of Architects
	Industry	Michael Pellis
Michael Cross		Baskervill
Bryna Dunn		Moseley Architects, James River Green Building Council
John Grier		Urban Land Institute
Karl Bren		Green Visions Consulting
Steve Vermillion		Associated General Contractors
Annette Osso		Virginia Sustainable Building Network
Alan Hansen		DBI Architects, Inc.
Lou Wolf		SMBW Architects, PC
Bill Black		Virginia Society of the American Institute of Architects
David Keith		Clark-Nexsen PC
David Puckett		FPW Architects
George Salinas		IBM
Dick Ford		Commonwealth Architects
Sally Brown		Virginia Center for Architecture
Adele McClain		Partnership for Smarter Growth
Trent O'Connor	Maggie Walker Governor's School	
Energy	Thomas Thompson	Va. Division of Mines, Minerals and Energy

Robin Jones
Harold Crowder
Bob Burnette
Ken Schaal
Daryl Bishop
Ron Jefferson
Garry Simmons
Ed Slipek
Bernice Chu
Lauren Williams

Va. Division of Mines, Minerals and Energy
Dominion Virginia Power
Dominion Virginia Power
Commonwealth Solar Power
Pepco Energy Services
AEC
Appalachian Power Co.
Maggie Walker Governor's School
Maggie Walker Governor's School
Maggie Walker Governor's School

Housing

Josh Galloway
Tyler Craddock
Kit Hale
Chris Lowrie
Lyn Boyer Haines
Sylvia Hallock
Anthony Scott
Kendra Jones
Stephen Weisensale

Better Housing Coalition
Home Builders Association of Richmond
Housing Virginia
Housing Virginia
ElderHomes
Habitat for Humanity
Richmond Redevelopment and Housing Authority
Maggie Walker Governor's School
Architects Dayton Thompson + Associates

Finance

Raymond Owens
Steven Lowrie
Randolph Trow
John Exum
Theresa M. Swann
Jim Chandler
Glenn Hudson
David Jeffers
Tina K. Neal

Federal Reserve Bank of Richmond
Money Management Systems
First Market Bank
Bank of America
Bank of America
Virginia Housing Development Authority
Local Initiatives Support Corporation
Indelium
Ferris Baker Watts

Appendix IV T. Duncan Abernathy

An architect licensed in Virginia since 1993, Duncan Abernathy has served since 1996 as the director of government and industry affairs for the Virginia Society of the American Institute of Architects. He has addressed various organizations on legislative topics related to architecture including the Public-Private Education Act, the Virginia Public Procurement Act and professional-service overlap. Abernathy's duties include representing the profession before legislative and regulatory bodies. His efforts on behalf of the architecture profession in Virginia were recognized by the national organization in 2002 with the association's distinguished achievement award. He continues a small architecture practice in his off hours.

Sally Brown

Sally Brown has been active in Richmond civic affairs since the early 1990s when, as a board member of Stony Point School, she successfully led the effort to reverse declining enrollment and restructuring of the board. She currently serves on the Mayor's Advisory Committee for Shockoe Bottom, Shockoe Slip, Fulton Bottom & Rockets Landing Development; the Community Advisory Committee for VCU; and the 17th Street Farmers' Market Advisory Committee. With an education in interior design and architecture, she has taught design at several institutions in Virginia; published articles and papers on design, furnishings and architecture; and was the curator for furniture and architecture exhibitions in Virginia. Ms. Brown has exhibited her own work in several Richmond venues. She also serves on the board of the Virginia Center for Architecture Foundation. Ms. Brown is a fellow at the Institute for Urban Design in New York City.

Chris Lowrie

With twenty-five years of marketing and public relations experience, Chris Lowrie has worked in national, regional and local fund development and marketing, and served as executive director of the Virginia Home Energy Rating Organization, a pilot program for U.S. Department of Housing and Urban Development

and U.S. Department of Energy. Her work with this nonprofit was awarded with a Virginia Senate resolution in 1996. Lowrie completed undergraduate studies in Creative Writing at Hobart College in Geneva, New York, and graduate studies in Social Marketing at Syracuse University. She was a member of the Sorensen Institute of Political Leadership, class of 2000, and ran for the House of Delegates in the 65th District in 2001.

Steven Lowrie

A seasoned management executive and social entrepreneur, Steven Lowrie has 25 years of experience in marketing, public relations, real estate, finance and business development. Relocating to the United States in 1993 from Scotland, he formed a company involved in creating strategic partnerships with federal, state and local governments, banks, real estate groups, builders and others to promote awareness in residential energy efficiency and financing. In a four-year period, his company affected the energy efficiency of over 50,000 homes in 42 States. He negotiated, designed and implemented several national programs for the financing of energy-efficient new homes, among which were those of E-Seal and Energy Star. Steven has been a featured speaker at literally hundreds of conferences in the U.S.A., Australia and Europe and has appeared in many radio and TV interviews about real estate, energy efficiency and the environment. He has also helped launch an Internet real estate company and a groundbreaking construction technology product.

Michael Pellis

Michael Pellis, a Senior Project Architect at Baskervill, had his own design practice for eight years in the San Francisco Bay Area. His designs incorporated active and passive heating and cooling whenever possible as well as incorporating recycled, low VOC and renewable materials. Some highlights of his work include the American Hebrew Academy (<http://www.americanhebrewacademy.org/applying/tour.asp> click on "view campus map"), a 74-building campus in North Carolina with the largest closed loop geothermal system in the United States. Another example is the Margarido Residence (<http://www.m-c-d.net/>), a 4,500-square-foot residence located in Oakland, California, which is sponsored by the USGBC as part of

the first LEED pilot project for new home construction and is slated to be completed by the end of 2007. Recently, he co-founded a resource team for Baskervill called Best Environmental and Energy Practices (BEEP). This group promotes environmental awareness within the firm and acts as a resource that integrates sustainability into the designs for our clients.

Thomas (Tommy) R. Thompson

Tommy Thompson is currently serving as Energy Manager in the Division of Energy of the Department of Mines, Minerals, and Energy and has been in this position for over three years. His current job involves review of performance contracts, technical specialist for natural gas, heating oil, and electricity contracts, energy data collection and analysis. Prior to that, he was Director of Utilities at Virginia Commonwealth University and has held various engineering and management positions in the private sector. Tommy received his B.S. in Computer Science and M.B.A. from Virginia Commonwealth University. He is a past president of the Richmond Chapter of the American Society of Heating, Refrigerating and Air-Conditioning Engineers and holds certifications in Energy Management and Energy Procurement.