2012 Eco-City Progress Report & Key Environmental Indicators

Early in 2007, under the direction of and with strong commitment from the Mayor and Members of City Council, the City of Alexandria, in partnership with its Environmental Policy Commission (EPC), Virginia Tech Alexandria Campus and the community, embarked on a new initiative – Eco-City Alexandria – which culminated in the Council's adoption of the Eco-City Charter, the first of its kind in the Commonwealth, in 2008, as well as the Environmental Action Plan 2030 (EAP 2030) in 2009. Since then, the City and its residents have collectively completed numerous actions stipulated in this action plan aimed at fostering the goals of the Eco-City and leading Alexandria further towards environmental sustainability. This second annual report provides quantitative measures of the progress that the residents and the City government have made during 2012. These measures are in the form of 20 environmental indicators developed by the EPC in consultation with City staff.

Eco-Cities

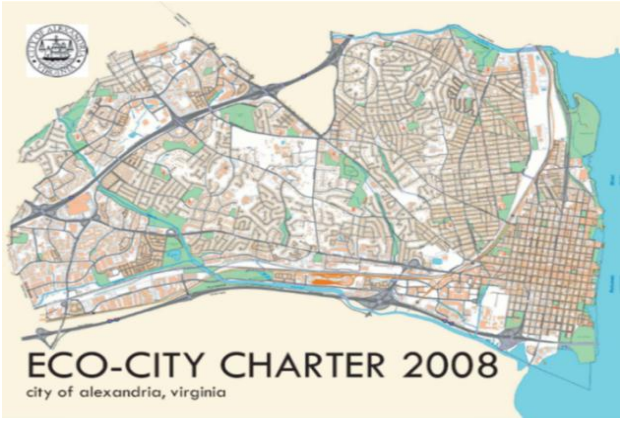
Eco-Cities are places where people can live healthier and economically productive lives while reducing their impact on the environment. They work to harmonize existing policies, regional realities, and economic and business markets with their natural resources and environmental assets. Eco-Cities strive to engage all citizens in a collaborative and transparent decision making process that is mindful of social equity concerns.

Sustainability is defined as meeting our community's present needs while preserving our historic character and ensuring the ability of future generations to meet their own needs.

The Eco-City Charter was the first Environmental Charter adopted in Virginia. The *Eco-City Charter* serves as a document to holistically guide City leaders and residents towards a more sustainable and healthy environment. It defines Alexandria's commitment to ecological, economic and social sustainability. The *Eco-City Charter* outlines essential environmental sustainability principles and core values, and is consistent with the City's 2015 Strategic Plan.

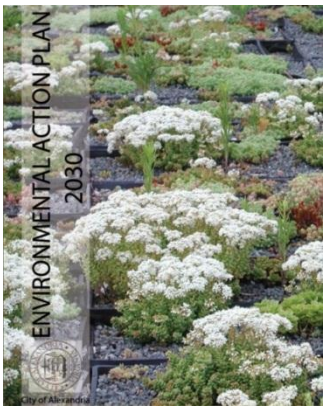
Eco-City Charter's Ten Guiding Principles

Land Use and Open Space	Building Green
Water Resources	Solid Waste
Air Quality	Environment & Health
Transportation	Emerging Threats
Energy	Implementation



The Environmental Action Plan 2030 follows the guiding principles outlined in the Eco-City Charter, and serves as a road map for City leaders and residents to implement the *Eco-City Charter.* Following an extensive community

outreach program which included an interactive Eco-City Café, open houses and an Eco-City Summit, City Council adopted the Environmental Action Plan (EAP) 2030 in June 2009. The EAP 2030 consists of 48 goals, 50 targets and 353 actions for the next 20 years to lead the City towards environmental sustainability.



Environmental Indicators - The Environmental Policy Commission spearheaded the development of the environmental indicators that can be measured on a routine (preferably annual) basis to quantify the progress made on the Eco-City initiative. In consultation with City staff, the commission decided on the 20 indicators listed in Table I which are related to the goals and targets of the EAP 2030 and represent activities that cover key stakeholders of Alexandria such as its residents, City government, businesses, the Alexandria City Public Schools (ACPS), DASH, American Virginia Water, and Alexandria Renew Enterprises (formerly ASA). This is the second time these environmental indicators were reported. The base year for each indicator has been chosen so as to provide a meaningful measure of progress. The "% Change 2011 vs. 2010" and "% Change Current vs. Base" indicate the % changes between 2011 and 2010 and between 2011 and the base year, with a green value meaning a favorable change and a red value an unfavorable condition. The current reporting period is either calendar year 2011 or Fiscal Year (FY) 2011 since some data for 2012 or FY2012 have yet to become available at the time of this report.

TABLE I – ENVIRONMENTAL INDICATORS

ENVIRONMENTAL INDICATOR (EI)	TARGET	BASE YEAR[1]		CURRENT PERIOD	LAST YEAR	% CHANGE	% CHANGE
		YEAR	VALUE	FY2011 or 2011	FY2010 or 2010	2011 vs. 2010	Current vs. Base
1. Air Quality Days - number of days with code red/ orange	NA	2003	13	7[2]	10	-30%	-46.1%
2. Per capita energy use, MWh per person per year	NA	2005	24.54	21.49[3]	24.28	-11.5%	-12.4%
3. City government operations energy use, MWh per year	NA	FY2006	151,964	117,254[4]	121,064	-3.1%	-22.8%
4. Greenhouse gas emissions by City government operations, metric tons of CO_2 per year	NA	FY2006	79,820	53,320[5]	65,616	-18.7%	-33.2%
5. Greenhouse gas emissions by residents and businesses, metric tons of CO_2 per year	NA	2005	2,092,991	1,777,215[5]	2,184,371	-18.6%	-15.1%
6. Per capita greenhouse gas emissions, metric tons of CO_2 per year	NA	2005	15.8	12.7[5]	16.1	-21.1%	-19.6%
7. Percent of new developments committing to green building standard	100%	FY2010	94%	96%	94%	+2.1%	+2.1%

ENVIRONMENTAL INDICATOR (EI)	TARGET	BASE YEAR[1]		CURRENT PERIOD	LAST YEAR	% CHANGE	% CHANGE
		YEAR	VALUE	FY2011 or 2011	FY2010 or 2010	2011 vs. 2010	Current vs. Base
8. Percent tree canopy	40%	2007	30%	N/A[6]	34%[6]	-	-
9. Number of acres protected since approval of Open Space Master Plan in 2003	100	2003	0	88	69	+27.5%	-
10. Percent solid waste recycling rate	35%	2008	26.9	48.4	41.4	+16.9%	+79.9%
11. DASH Public transit ridership - number of mass transit commuters per year	N/A	FY2007	3,743,499	3,750,776	3,789,544[7]	-1%	+0.2%
12. DASH Total passengers per mile / Total passenger per hour of service	NA	FY2007	2.9 / 34.0	2.7 / 24.8	2.8 / 25.2[7]	-3.6% / -1.6%	-6.9% / -27%
13. Per capita water use, gallons per person per year	NA	2005	38,249	36,724	38,116	-3.6%	-4%
14. Per capita waste water treated, gallons per person per year	NA	2009	36,016	39,986	36,723	+8.9%	+11%
15. Number of stormwater Best Management Practices (BMPs) in the City	NA	2005	292	349	328[8]	+6.4%	+19.5%
16. Number of respiratory health complaints received by the Alexandria Health Department	NA	FY2010	82	59	82	-28%	-28%
17. Percent of full service restaurants that are totally non-smoking	100%	FY2010	96.7	96.9	96.7	+0.2%	+0.2%
18. Percent of population living in a walkable community	NA	FY2010	73	73	73	0%	0%
19. ACPS energy usage per square foot of building space, Btu/ft^2/year	NA	FY2010	61,717	47,767[9]	61,717	-22.6%	-22.6%
20. ACPS waste composting rate, Pounds per year	NA	FY2008	77,900	170,182	266,329	-36.1%	+118.4%

[1] Base year for each indicator is chosen to provide a meaningful basis for comparison. Fiscal year starts July of the year before and ends at the end of June of the current year.

[2] All air quality days (one red and six orange) were due to ozone and for an 8-hour period.

[3] Energy use comprises electricity use (per calendar year) provided by Dominion and natural gas use provided by Washington Gas; based on Alexandria population of 137,602 for 2005, 139,966 for 2010 and 144,301 for 2011.

[4] City government operations include Alexandria City Public Schools (ACPS) and for calendar year 2011.

[5] Starting in 2011, all energy data reported in EI #2-6 are reported on calendar year basis. The significant changes in EI #3-6 for 2011 were due mainly to the 28.9% reduction in the GHG emission factor from 1,466 lb CO2e/MWh to 1,041.7 lb CO2e/MWh for 2011, per the SERC Reliability Corporation Virginia/Carolina eGRID sub region. The inventory does not include emissions associated with air or vehicle travel outside City limits, or emissions embedded in food or other consumer goods from outside of the City.

[6] Data is not available for 2011. The % tree canopy was measured in 2007 and 2010 using different techniques so these data may not be compared with certainty.

[7] The numbers which were provided in last year's report were DASH's own numbers and were revised using information the City filed in to the Federal Transit Administration's National Transit Data (NTD) Base.

[8] QA/QC was performed on the City's Best Management Practice (BMP) facility database during FY2012 and FY2013. The number of BMPs in the City during those years has been updated. The number of BMP facilities for 2010 was revised due to several factors, such as duplicate entries, facilities removed / replaced, or facilities planned but never built.

[9] Data is for calendar year 2011.

Main Findings from the Environmental Indicators

Several findings can be derived from Table I, even though the data reported in this table represents a snap shot of the progress made over a relatively short period of time.

1. Compared to 2010, the per capita energy use for the Alexandria community (EI #2) reduced by a significant 11.5% and is 12.4% less than that of 2005. This is an excellent trend and might result from the ongoing energy conservation effort from the community but it is a bit too early to confirm.
2. The Alexandria City Public School (ACPS) significantly reduced its energy usage per square foot of building space by 22.6% (EI #19). This is a direct result of its investment in renewable and energy-conserving technologies over the last few years as well as ongoing energy conservation efforts. City government energy use (EI #3) also reduced by 3.1% compared to 2010 and was 22.8% less than the base year (FY2006).
3. For the current reporting period, the GHG (greenhouse gas) emissions for the City government including the ACPS reduced by 18.7% (EI #4). Likewise, GHG emissions by the residents and businesses reduced by a similar 18.6% and the per capita GHG emissions (EI #5) by 21.1%. The major factor that contributed to these significant decreases in GHG emissions is the updated 2011 GHG emissions factor for electricity generation. In 2005 and 2010, this factor was 1,466 Lb. of CO_2e per kWh, while the same factor provided by the US Department of Energy for 2011 was 1,041.7 Lb. of CO_2e per kWh for the Virginia region. This directly reflects the increased use of natural gas and renewable energies combined with more efficient power plant technologies going from 2005 to 2011. In this regard, the recent permanent closure of the GenOn power plant in Alexandria and replacement of its electricity production with that using a cleaner fuel will further contribute to the reduction of the GHG emissions factor for the Virginia region.
4. The City achieved yet another record recycling rate of 48.4% in 2011 (EI #10) and is well on its way to meet the 2020 target of 50% stipulated in the City's Environmental Action Plan 2030.
5. The City made good progress on acquiring additional open space and the number of acres protected since the adoption of the 2003 Open Space Master Plan was 88 acres at the end of 2011 (EI #9).
6. The per capita water use reduced by 3.6% (EI #13) while the wastewater treated increased by 8.9% (EI #14). The number of storm water best management practices (BMP) increased by 6.4% (EI # 15).
7. The Number of respiratory health complaints received by the Alexandria Health Department (EI #16) reduced significantly by 28%.
8. ACPS waste composting rate (EI #20) reduced significantly by 36.1%.

Alexandria's Top Ten Environmental Achievements for 2012

1. **Permanent Closure of the GenOn Potomac River Generating Station (PRGS) as of October 1, 2012** – The permanent closure of this outdated coal-fired power plant marks a significant milestone for the City of Alexandria and its residents. For several years, this plant has been the single largest air pollutant source in the Northern Virginia region. At the peak of its production during the period 2001-2003, this power plant emitted some 15,000 tons of sulfur dioxide, 6,000 tons of nitrogen oxides and 600 tons of PM10 annually. Additionally, this plant has the capacity to emit up to 4.5 million tons of carbon dioxide annually, equivalent to emissions from about 600,000 cars.

2. **Solid Waste Recycling Rate -** The City reported its highest ever recycling rate of 48.4% to the Virginia DEQ for CY 2011. This significant increase over last year's reported 41.4% recycling rate was due primarily to significant increases in overall recycling collections. The City also partnered with a local non-profit foundation to recycle 110 tons of electronic items including 2,271 televisions and computer monitors. City residents dropped off 38,000 Gallons of Toxic Waste during 2012 thanks to the extended open hours of the Household Hazardous Waste Collection Center.

3. **Capital Bikeshare Established** – The City launched its participation in the Capital Bikeshare Network with the installation of eight bikeshare stations in Old Town. Capital Bikeshare Network is the largest bikeshare system in the country, with over 180 stations in the region, and more than 1,600 bicycles. Using Capital Bikeshare is an easy, environmentally-friendly and healthy way to get around Alexandria and enjoy the historic landscape of the city.

4. **Alexandria Transit Company's New DASH Buses and Trolleys** - In April 2012, Alexandria Transit Company (ATC), the operator of DASH, took over operation of the King Street Trolley using five brand new 30-foot low-floor hybrid electric trolleys. The new and improved King Street Trolley has been a great success since its launch in April 2012, and continues to gain in popularity. Since ATC started operating the King Street Trolley, monthly ridership has grown significantly, increasing over 65%, between May and September 2012.

5. **Solar Photovoltaic Systems Installed at Beatley Central Library and Other Alexandria Facilities** - Using funding from the Department of Energy EECBG program, the City and Alexandria Library worked jointly to complete installation of a solar photovoltaic system at the Beatley Central Library. Converting sunlight to electricity, the 42.3 Kilowatt system features 180 solar panels that spread across each of Beatley's five south-facing roof sections. Other installations of solar photovoltaic systems are located at (i) the new restroom building at Witter Recreational Fields which is the first park structure to include solar panels in the City; and (ii) Alexandria Renew main pump station building.

6. **Green Building Policy** - The Green Building Policy approved by City Council in 2009 has been successful in ensuring new developments commit to obtaining a minimum level of green building certification. In 2012, some of the notable projects that have been reviewed per the policy and will obtain a green building certification include (i) three residential buildings totaling 492 units with ground floor retail (Landmark Gateway); (ii) a 69,000 ft^2 grocery store with 253 residential units (Giant in Potomac Yard); (iii) a 130,000 ft^2 school (Jefferson Houston); (iv) a 370,000 ft^2 office building (IDA in Potomac Yard); and (v) a 39,000 ft^2 fire station (Eisenhower Avenue Fire Station).

7. **Sustainable Construction at Alexandria Renew** – Alexandria Renew Enterprises is currently going through a multi-phase facility upgrade called the State-of-the-Art Nitrogen Upgrade Program (SANUP) to enhance its ability to remove nitrogen from wastewater. As part of the program goals, it incorporated sustainable requirements directly into the construction contract documents, encouraging environmentally responsible behaviors and the use of green resources. Contractors are required to report their efforts on a monthly Sustainable Construction Log. The results for 2012 were quite impressive with several green practices quantified.

8. **Environmental Indicators** - The City and Alexandria

Environmental Policy Commission developed 20 environmental indicators that can be measured on a routine basis to quantify the progress made on the Eco-City initiative. One of the major findings from the first report on these indicators (published in April 2012) is that increased participation and commitment from residents and businesses are essential to Alexandria's success in reducing GHG emissions.

9. **Bicycle and Pedestrian Trail Construction** – The City completed several bicycle and pedestrian projects in 2012 aimed at making bicycling and walking safer. The Charles Barrett Safe Routes to School Project completed construction in October 2012. The project included shortened pedestrian crossings through geometric reconfiguration of intersections by the school, sidewalk installation, and parking changes. In Jones Point Park, the Mount Vernon Trail has been constructed with new park and trail connections at North Royal Street linking North Royal Bike Route to Woodrow Wilson Bridge Trail. For the Dora Kelley Park Trail, an eco-friendly material has been used for trail surface.

10. **City of Alexandria Achieves VML Platinum Level Certification for the Fifth Consecutive Year** - For the fifth straight year, the City of Alexandria earned Platinum level certification, the highest level of recognition by the Virginia Municipal League (VML) as part of its Green Government Challenge. This certification by VML reaffirms the City's long term commitment to the Eco-City Alexandria initiative.

Alexandria Environmental Policies, Plans and Programs Web Links

T&ES Office of Environmental Quality Website
http://alexandriava.gov/Environment
Alexandria Environmental Policy Commission Website
http://alexandriava.gov/EnvironmentalPolicyCommission
Eco-City Alexandria Website
www.alexandriava.gov/Eco-City
Environmental Action Plan 2030
alexandriava.gov/uploadedFiles/tes/eco-city/EAP_FINAL_06_18_09.pdf
Eco-City Charter
alexandriava.gov/uploadedFiles/tes/oeq/EcoCityCharter2008.pdf
Eco-City Alexandria "A Green-Ventory of City Environmental Policies, Plans and Programs
alexandriava.gov/uploadedfiles/tes/info/GreenVentoryReport.pdf
Eco-City Challenge
http://alexandriava.gov/EcoCityChallenge
Compendium of Model Sustainability Practices
ecocity.ncr.vt.edu/model.html
Open Space Plan
alexandriava.gov/uploadedfiles/recreation/info/OpenSpacePlan.pdf
Recreation, Parks & Cultural Activities Strategic Master Plan
alexandriava.gov/uploadedFiles/recreation/info/StrategicMasterPlan.pdf
Transportation Master Plan
alexandriava.gov/tes/info/default.aspx?id=3088
Water Quality Management Supplement
alexandriava.gov/tes/info/default.aspx?id=3844
Solid Waste Management Plan
alexandriava.gov/uploadedfiles/tes/info/solidwastemgmtplan.pdf
City of Alexandria Green Building Policy
alexandriava.gov/uploadedFiles/planning/info/GreenBuildingPolicyhandout.pdf
Green Building Resource Center
https://www.Alexandriava.gov/gbrc

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