

## Arcadia Green/ Sustainable Cheltenham May 2012

Arcadia University, located in Glenside (Cheltenham Township) Pennsylvania, has been an active member of Sustainable Cheltenham since it was formed in 2011, with Arcadia's President Tobey Oxholm and Assistant Provost Mark Curchack serving as members of the Steering Committee from the start. In this "report card", Arcadia identifies its "green initiatives" following the format of Sustainable Cheltenham. We would be pleased to provide additional information to anyone willing to join us in promoting a Sustainable Cheltenham.

A) COMMUNITY ENGAGEMENT: Engage and educate all Cheltenham citizens, students, and stakeholders to unite behind a shared set of goals to build a sustainable future.

- 1. Maintain the "Arcadia Cares" website that details sustainability efforts and achievements and provides a list of energy saving tips.
- 2. Established the Environmental Network, a student-led program that has begun to increase environmental awareness on campus, reduce the school's environmental waste, and maintain recycling on campus. They coordinate events and projects, plan cleanups and tree plantings off campus and the work to improve the recycling system on campus. Off-campus organizations that are supported include the Tookany/Tacony-Frankford Watershed Partnership, the Cheltenham Environmental Advisory Council, Transition Philadelphia (formerly Transition Cheltenham), the Downtown Glenside Community Partnership, the Friends of Fort Washington State Park, and Cedarbrook Middle School.
  - a. The Network hosted a table at the annual Glenside Street Fair and the Community Service Office's twice-annual Flea Market where students helped educate visitors about recycling projects that can be done with young children
- 3. Participate in and promote National RecycleMania contest.
- 4. Participate in Sustainable Cheltenham Task Force.
- 5. Host community-wide shredding, e-waste and repurposing events.
- 6. Arcadia students assisted students from the Cedarbrook Middle School in creating a riparian buffer along Rock Creek. Building the buffer was a key step in creating a permanent outdoor classroom to be utilized by all future Cedarbrook students and school partners.
- 7. The University hosted the founding meeting of the Creekside Cooperative, which had over 150 attendees from the local community.
- 8. The Coordinator of Community Service served on the Board of Directors of the Tookany/Tacony- Frankford Watershed Partnership.
- 9. As part of the annual "Dr. Seuss Day" engaged over 370 children and their families in recycling-based activities.

B) **RENEWABLE ENERGY:** Strive to reduce energy demand and emissions, and to offset 100% of the community's energy consumption with equal investments in renewable energy sources within the community, the region, and the state.

- 1. Newest construction, the University Commons:
  - a. Smart windows—Some windows are smart, opening and closing themselves to provide outside air to the building when they sense the pre-programmed need.
  - b. Smart lights—Lighting in the Commons senses how bright it is outside, decides if there is enough light and turns itself on if there isn't enough comfortable light.
  - c. Smart rooms—Occupancy sensors decide if the lights in certain areas need to be on if no one is around. New high-definition videoconferencing that brings global excellence to Arcadia University from around the globe in nanoseconds without any carbon.
  - d. Low-E insulated glass—Windows in the Commons are coated with a thin layer of metal that reflects radiant infrared energy while letting visible light pass. In the winter, radiant heat is reflected back inside, and in the summer infrared heat radiation from the sun is reflected away.
  - e. Smart floors—Below the floor, the concrete floors have radiant heat coils buried into the concrete. The unseen coils run heated water from the geo-thermal well system throughout the first floor area of the building, keeping visitors passively warm in the winter.
  - f. Solar panels—Panels above the balcony provide self-generated electricity by harvesting sunlight. The metal roof on the Commons was designed to accept more solar panels in the future.
  - g. Geo-thermal heating and cooling—More than four miles of piping connect 42 wells nearly 400 feet deep under Haber Green to utilize nature's temperate waters, which are stored in the earth, to warm and cool the Commons. The well field was designed to allow for an additional 42 wells for future growth.
  - h. Rainwater harvesting—An underground system captures and holds rainwater runoff from the roof of the Commons for irrigation of local plant material upon demand. The storm-water retention basin under Haber Green was built with 20 percent additional capacity for future building needs.
  - i. Natural light—Large window areas allow for additional natural lighting throughout the building.
  - j. Well water—A well 700 feet deep irrigates Haber Green. No processed city water will be wasted for this purpose.
  - k. Low-VOC paints—Paints low in volatile organic compounds (VOCs) are used through the buildings for a healthier indoor air environment.
  - l. Recycled materials—Virtually all construction-related materials disposed of were recycled for future use.
  - m. Piggybacking on existing infrastructure—The Commons shares many systems with Kuch. Electrical, elevators, bathrooms, water, fire protection, sprinkler systems, and electrical systems were adapted to accommodate the new building.
  - n. Energy savings—LED and other low-volt lighting technology and controls are used throughout both buildings, and the highest efficiency HVAC system now cools and heats the Alumni Gymnasium.

- 2. Sky parks—The new highly insulated, solar reflective flat roofing sections of the Commons and Kuch were designed for future green roofing options and elevated park areas.
- 3. New high-efficiency gas burning boilers in Boyer Hall, Taylor Hall and the Castle; covert from oil to gas in Blankley Hall.
- 4. Replace a 500 gallon water heater in the Dining Hall with an 80 gallon one that also heats the building.
- 5. Replace old pool heating system with high efficiency unit; using excessive heat to warm the building.
- 6. Mechanical HVAC systems redesigned to allow for constant full cycle circulation of hot water, allowing higher degree of even and efficient heating.
- 7. Changing a/c filters on regular basis.
- 8. Redesign residence hall dryer vents for more efficient operation.
- 9. Regular inspection of all electrical loads to find and repair any losses.
- 10. Installed insulation in residence hall stair wells and below third floor deck areas.
- 11. White, heat-reflective roof placed on Heinz Hall.
- 12. We will be painting the observatory with a special coating that allows it to turn white in the summer to reflect heat, black in the winter to absorb heat?
- 13. Will also be painting additional roofs white on Boyer, Taylor Hall and the library to reduce heat load in summer.
- 14. New roofing on Spruance Hall adding an insulating air space to reduce heating needs.
- 15. Repairing all rooftop ventilators to return to proper moisture levels and thus reduce a/c loads.
- 16. Retrofitted highly inefficient lighting systems in the pool area, fitness center and gym with high efficiency lighting systems; reduced electrical consumption by 50 percent with 5 year life on induction bulbs.
- 17. 100s of computer desktop systems go to sleep at night, to save energy.
- 18. CFL bulbs replaced almost all incandescent bulbs on campus.
- 19. Changed bulbs in long fluorescent fixtures from T-12 to more efficient T-8.
- 20. LED lighting, on motion sensors, in hallways of Heinz Hall and Thomas Hall.
- 21. Original casement windows replaced with thermo-pane glass in all buildings except the Castle.
- 22. Installed automated electronic thermostats to control heating and a/c in Oak Summit Apartments.
- 23. When not in use, buildings are shut down almost entirely.
- 24. Vending machines replaced by more energy efficient units.
- 25. Newest classroom building (Easton Hall):
  - a. Skylights on upper floor hallway and in stairwells.
  - b. Automatic occupancy sensors on light switches in hallways.
  - c. Partial earth sheltering of the foundation.
  - d. High R-value in concrete insulation panel on the roof.
  - e. Energy efficient lighting fixtures throughout.
  - f. Advanced HVAC controls conserve energy.
  - g. Pond lighting system is low voltage LEDs on a timer.
  - h. Able to share major building systems with adjoining structure, saving on additional use of resources.

- 26. Eliminate trays in the dining hall (saving the energy of washing).
- 27. Change heat-losing steam-driven kitchen appliances with electric systems used only on demand.
- 28. 1,000 LED bulbs around campus, replacing 1,800 watts of usage with 200 watts.
- 29. Install green roof on a portion of Boyer Hall (the Science building)
- 30. In Grey Towers Castle:
  - a. Make operable louvers in the penthouse; install high efficiency fans to use the natural updraft of the atrium for cooling in the summer (the Victorian system).
  - b. Move the heat sensor driving the heating cycle to indoors—saving \$50,000 in gas heating costs.
  - c. Install doors between breakfast room and the conservatory.
- 31. Replace gasoline powered campus motor fleet with electric carts.
  - a. Eliminated two vehicles.
  - b. VP Facilities and President given hybrid cars.
- C) **HOLISITC TRANSPORTATION:** Reduce vehicular travel and emissions, increase use of public transportation, and make it desirable and convenient to walk and bike throughout the township and region.
  - 1. Build bike path and 2 miles of walking trials, connecting to Township pathways.
  - 2. Build bus stop on Easton Road.
  - 3. Switch to electric carts and hybrid cars—eliminate two gasoline fueled vehicles.
  - 4. Establish Zip-Car site (August)
  - 5. Build connector roadways between previously isolated lots (reducing need to drive around campus).
  - 6. Install bike racks on campus.
- D) **WASTE REDUCTION:** Aggressively reduce solid and hazardous waste and maximize the use of waste products as a resource.
  - 1. Recycling containers in all campus locations with clear plastic liners to facilitate sorting.
  - 2. Now accepting comingled recyclables: waste stream reduced at least 30%
  - 3. Install five newer, more powerful trash and recycling compactors; cut back on pickups (and subsequent charges) and save on fuel.
  - 4. We recycle:
    - a. Light bulbs.
    - b. Computers and associated parts.
    - c. Clay from the pottery studio—reprocessed and reused.
    - d. Diseased and/or hazardous tree removal, limbs and their associated leaves are ground up and used for mulch.
    - e. Tree transplanting—in lieu of cutting down trees, Arcadia has transplanted (moved out of harm's way) many large-caliber trees to other parts of campus.
    - f. Building materials, including schist from prior estate buildings.
    - g. Blacktop.
    - h. Concrete.
    - i. Office paper to include all shredded documents.

- j. Corrugated boxes.
- k. All automobile oils and fluids.
- 1. Refrigerant oils and CFC refrigerant.
- m. All elevator oils.
- n. Cooking oils, converted to biodiesel.
- o. Motor oil.
- p. Batteries.
- q. Silver nitrate is recovered from photographic developing processes.
- r. Toner cartridges.
- s. Tires.
- t. Commingled bottles, cans and plastic.
- u. Scrap metal, stainless steel, copper, iron and steel.
- v. Residence hall furniture and mattresses are donated to those in need.
- w. Classroom desks and furniture are donated to various organizations.
- x. Clothing and personal items left behind by students are sold as a fund-raiser for community service or donated to various organizations.
- 5. Trayless dining hall (saves water and energy of washing trays.
- 6. Elimination of styrofoam food containers, replaced by recyclable paper.
- 7. Recycled material for napkins in dining services.
- 8. Biodegradable wrappers for takeout foods.
- 9. Discounted beverages for those using reusable mugs.
- 10. Install chemical dispensers that accurately set the dilution of cleaning chemicals, resulting in less waste.
- 11. Paper towels and toilet tissues use 20-40% recycled paper.
- 12. Working within the walls instead of building new structures to allow for growth and expansion: e.g.: Boyer Hall, Easton, Brubaker renovations /repurposing of non-functional spaces into useable spaces.
- 13. End of Year Recycling--Usable household items such as sofas, rugs, lamps, etc., in addition to clothing and non-perishable food items are collected at the end of each academic year. Donations are given to Salvation Army and local Community Food Banks.
- 14. Sponsor two flea markets annually, are open to local vendors and other community members looking for an alternate method of disposing of unwanted items.
- 15. Annual Day of Service event recycled 17,000 pounds of electronics that could have otherwise ended up in a landfill; more than 10 tons of paper were shredded by Nexcut in an environmentally-friendly process.
- E) *GREEN INFRASTRUCTURE:* Reduce storm water runoff and wastewater flows, and maximize the utility of rainwater as a resource.
  - 1. Water and sewer usage dropped by 20%:
    - a. Install low-flow showerheads in residence hall showers.
    - b. Low flow faucets common.
    - c. Comprehensive attention to dripping faucets and other water leaks.
    - d. Over 30 "power flush" low water use toilets.

- e. Some waterless urinals.
- f. Replace water-cooled mechanical system with high-efficiency air-cooled ones.
- 2. University Commons downspouts run to a catchment where water is used for irrigation.
- 3. Pond at Easton Hall uses recycled water that is filtered, along with rainwater it captures; none flows to sewers.
- 4. Construction of Easton Hall allowed us to redirect underground stream to its prior natural outflow.
- 5. Install new storm drains at curbside with overspill drains to accommodate heave flows.
- 6. Timed, drip irrigation system for small plant watering.
- 7. All new building and surface parking projects have underground detention basins with perforated pipes to allow slow percolation of storm water.
- 8. Added additional underground retention tanks to the field at Kuch to anticipate future construction needs have. Credit for an additional 10 k of building space covered by the additional underground retention tanks.
- 9. Preserving or increasing permeable surface:
  - a. Two new projects--classrooms behind Murphy Hall and Oak Summit parking deck—build on top of already impermeable surfaces.
  - b. Two houses on Limekiln razed and returned to grass.
  - c. Planned demolition of Kaname greenhouses will create c.5,000 sq ft of grassy area.
  - d. Construction of artificial turf playing field along Easton Road will have a permeable surface leading to detention below ground.
  - e. Use of inflatable dome over tennis courts in winter gives us a seasonal 18K sq ft building with no use of permeable surfaces.
- 10. Arcadia students assisted students from the Cedarbrook Middle School in creating a riparian buffer along Rock Creek (noted above).
- F) *ECOLOGICAL STEWARDSHIP:* Protect and improve the overall health and ecological diversity of the Township's habitats, waterways, and soils, both on public and private lands.
  - 1. In the past five years, we have planted 15,000 plants and 536 trees, many of these local, drought-resistant varieties.
  - 2. Trees in the path of new construction have been transplanted to elsewhere on campus.
  - 3. Forested areas have been cleared of debris and invasive undergrowth (e.g., Japanese knotweed); more light available to understory, trees healthier; created 3 new park areas.
  - 4. Planted over 3000 daffodil bulbs.
  - 5. 4 baby giant sequoia evergreen trees from California now live on campus.
  - 6. Will be building second community garden this summer next to bee hives we now have at Kanabe greenhouses.
  - 7. Discovered/identified and are nurturing a rare American chestnut tree found on campus.
  - 8. Cleanup and plant the Limekiln gateway triangle.
  - 9. Semi- annual policing cleanup of the campus creek to remove debris flowing into it.
  - 10. Set up tree farms to propagate our own seedlings.
  - 11. Work with PENNDOT to create a berm along Rte 309 that will eventually have hundreds of trees.

- 12. Above ground detention pond near Rte 309 has been planted and is now a wildlife habitat.
- 13. Food services uses the Monterey Bay Aquarium's Seafood Watch Guidelines for Sustainable Seafood to continually increase the amount of sustainable fish purchased.
- 14. Inspect and repair all underground tanks.
- 15. Provide spill containment areas around above ground tanks.
- 16. Convert majority of cleaning chemicals to a citrus based system.
- 17. Retrofit campus lighting to minimize regional light pollution.
- 18. More than 100 volunteers annually support High School and Wall Parks by removing invasive plants, cutting away brush and dead branches, and aiding in general clean-up.
- G) **HEALTHY LIVING FOR ALL:** Promote healthy lifestyle choices in Cheltenham by ensuring equitable access to recreation, natural areas, car-free transportation, fresh local foods, health care services, clean air, and clean water.
  - 1. Since 2005, food service cooking oil has been trans-fat free.
  - 2. Fair Trade coffees are offered daily at Easton Hall Café.
- H) *LOCAL ECONOMY:* Promote and support local and regional agriculture, artisans, institutions, industry, and business by strengthening connections to, and markets for, local goods and services.
  - 1. Food service provider (Parkhurst) strives to purchase local supplies:
    - a. Seasonal produce is sourced within 125 miles of Arcadia University through Pocono Produce Company. When in season, 25% of the produce used is from local growers.
    - b. Dairy is produced without the growth hormone rBST and is purchased from local family farms.
    - c. Meat is purchased from regional farms when available.
  - 2. Developing purchasing plans that encourage our students and staff to buy from local merchants.
  - 3. Local construction firm has been used for the past four or more building projects.
  - 4. Adopted a "buy local" policy in August 2011 as part of a procurement policy that also encourages use of Minority/Women/Disadvantaged Businesses.
  - 5. Volunteers are working on maintaining a garden for both students and community members as part of Transition Philadelphia (formerly Transition Cheltenham). The garden helps teach Arcadia students and members of the local community about sustainable horticulture and organic gardening.
  - 6. Arcadia will serve as a pickup location for a local farmers Community Supported Agriculture (CSA) project.