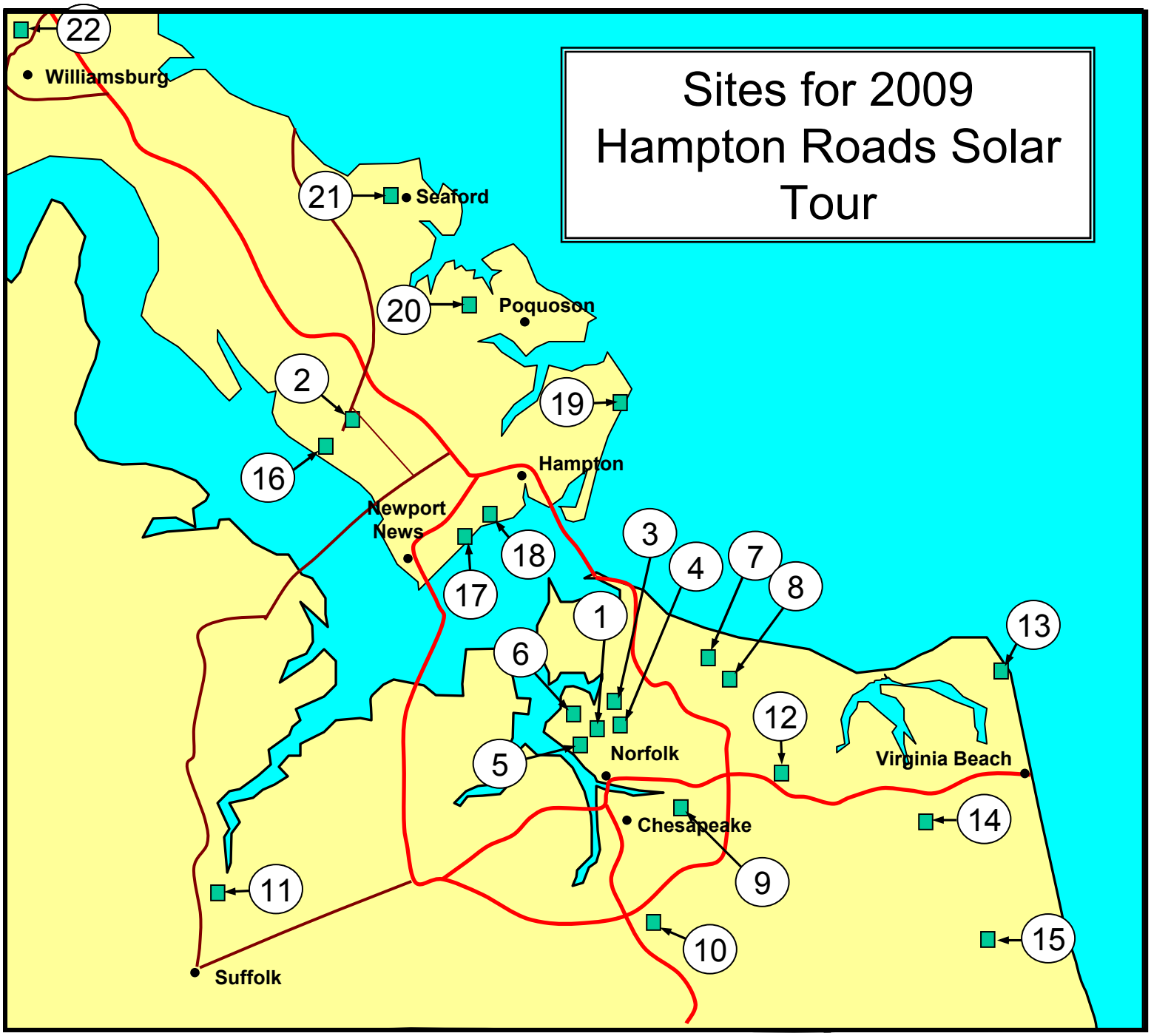

1. Ernie Morgan Center
2. Virginia Living Museum
3. McElroy Home
4. Amundsen Home
5. Stiles Home
6. Lambert's Point Community Center
7. Schein Home
8. Norfolk Botanical Gardens
9. Eagler Home
10. Good Home
11. Chung Home
12. Renaissance Academy
13. Johnson Home
14. Solar Services, Inc
15. The Mothership
16. Elber Home
17. Royer Technical Services
18. Cuker & Gerbing Home
19. Wright Home
20. Garden Atriums of Poquoson
21. Ross-Clunis Home
22. Ward Home

2009 Hampton Roads Solar Tour Program

<u>To the visitor</u>: The 2009 Hampton Roads Solar Tour is the first tour of its type to be held in the region, although similar tours have been going on for several years in other parts of the country. The purpose of the Tour is to demonstrate and demystify solar, renewable, and sustainable technologies so that you, the homeowner, can see them in action, talk to knowledgeable people, and go home and introduce them into your own homes. By doing so you will have done your part toward solving our energy and environmental problems. We hope you enjoy and learn from this event, and appreciate your feedback on how to improve it in the future.

The numbers for the sites listed have nothing to do with their quality or interest level. Other than Sites 1 and 2, they are simply a rough indication of their geographic location, so you can plan your tour time. Low numbers are on the Southside, high numbers are on the Peninsula. We expect you to plan your own tour in any order (you may avoid crowds by not following numerical order) and to get your own directions, but in some cases we've given you some extra information in italics to help you. **We strongly encourage you to visit Sites 1 or 2 to start your tour**, as they'll have lots of things to show and hand out. Site 2, the Living Green House of the Virginia Living Museum, will only be available for tour at 9 AM,; be make sure to arrive on time.

Starting Points

1. <u>Ernie Morgan Center</u> - 3500-A Granby St., Norfolk – The Southside tour begins here with a program at 9:00AM.
Features: PV system, daylighting, reused materials, eco-friendly décor, EcoGarden, straw-bale room

PV system provides approximately 40% of the Center's electrical needs. Four sun tubes and numerous windows take advantage of day-lighting. Reused materials were utilized throughout, including recycled linoleum, carpeting made of recycled plastic bottles, wallpaper from old posters and a hardwood floor reclaimed from an old pier. Low-flow faucets have been installed in each restroom, and programmable thermostats in two zones of the building help regulate heating/cooling for increased energy efficiency. The Center was recently painted with no VOC paints. The EcoGarden showcases green gardening techniques - native plants, rain barrels, rain gardens, a compost demonstration area, a pervious paver walkway and passive heating/cooling through the use of vegetation. An office with three straw-bale walls is available for viewing, with displays to showcase the depth of insulation and the actual bales of straw.

2. <u>Virginia Living Museum</u> - 524 J. Clyde Morris Blvd., Newport News – *This site will only be available for tour from 9:00 to 10:00 AM.*
Features: Living Green House (PV system, solar water heater, radiant heating, interactive fountain, day-lighting, passive solar architectural design elements.

Admission is waived for this hour only. The new Living Green House demonstrates many renewable technologies and is a great place to start your tour. 3-200 watt solar PV panels connect to the grid. An evacuated tube type solar water heater connects to a radiant floor heating system embedded in the slab concrete floor; portions are visible for the guests to view. Over 25 other green building techniques/products are also on display in this demonstration house.

The tour is scheduled to begin at 9:00 AM (participants need to arrive on time at the museum admission area-----the group will not be charged for the tour) and should last 45-60 minutes. Any participants who want to tour the entire museum that day will receive a $1 discount off regular admission fees.

PV = Photovoltaic

3. McElroy Home - 5614 Shenandoah Ave., Norfolk

Features: solar hot water, PV system, a green roof and a rainwater cistern.

Pre-heat temperature of the solar hot water heater is 110F in the winter, over 140F in the summer. The panel system measures solar energy captured by the system. With the federal tax break, the renewable energy certificate (REC) and the offset of natural gas, the system should pay for itself within 7 years.

The PV system makes 3400 W at peak sun and provides about 40% of monthly electric needs. The system should pay for itself within 11 years.

The green roof should have a lifetime of over 50 years and saves about 20% of air-conditioning bill. The 3000-gallon cistern, collects an estimated 80,000 gallons of rainwater per year. *(More information is at http://web.me.com/ruthandscott/Our_Green_House/)*

4. Amundsen Home – 1317 Baecher Lane, Norfolk

Features: PV system, solar water heater.

The PV system is large enough to nearly eliminate the electric bill from the utility.

5. Stiles Home – 1121 Graydon Ave., Norfolk

Features: EarthCraft™home (pending certification), sealed envelope, geothermal heat pump, energy efficient windows, roof overhangs, sky lights

The 2nd EarthCraft™ structure in VA. The envelope and crawl space are sealed. The geothermal heat pump is sized to post-insulation needs.

6. Lambert's Point Community Center - 1251 West 42nd St., Norfolk

Features: LEED-certified, solar tubes, bio-retention, low "heat-island" effect

The City of Norfolk's first LEED certified facility. Solar light tubes maximize natural lighting. An underground bio-retention storm water storage system and rain-garden reduce runoff and landscaping water use. The roof system has a low "heat-island effect" on the neighborhood.

7. Schein Home - 2735 E. Little Creek Rd, Norfolk

Features: Eco-renovation, PV system, solar water heater, low-impact cooling, recycled denim insulation, energy-efficient windows and roof, unique garden, low construction waste, rain barrels

The PV system provides about ½ of the power needs. Solar water heating provides almost all of hot water requirements. All major rooms have ceiling fans . Recycled denim is used over the insulation layer. There is a drought resistant garden; the grass was removed and all trees and shrubs are drought-tolerant. Recycled tire mulch is used in the entire garden and a composter for garden waste. Bricks from the demolition (prior to the addition) are used in various places in the garden and the neighbor's yard as well. All metal from the demolition was recycled, some sold. *The main part of the house and the bath in the master suite is fully handicapped accessible.*

8. Norfolk Botanical Gardens – 6700 Azalea Garden Rd., Norfolk

Features: solar electric system (used to power the water feature pumps in the Butterfly Pavilion).

9. Eagler Home - 4005 Ridgewood Court, Chesapeake

Features: Eco-renovation, peak venting system, energy-efficient roofing, solar water heater, biofuels heating system, low construction waste, energy efficient appliances, low-VOC paints

Light-colored architectural shingles reflect light . Solar panels heat water for hot water, swimming pool, and as part of the home heating system. Foundation power vents allow the house to "breathe". Attic insulation was upgraded to R49, all exterior walled electrical outlets have foam insulation, all windows/doors are energy efficient and include "layering" of blinds, shades, and window treatments. The electricity from the power company is from 100% "Green" sources. All fixtures, appliances, lighting, fans, toilets, cabinets, doors, flooring, etc. were either sold, donated to charity, or given away! Numerous low-impact gardening and lawn care techniques are applied.

10. Good Home - 202 Shadowlake Ct., Chesapeake

Features: solar hot water heat to home and pool, PV system.

11. Chung Home – 211 River Inlet Rd, Suffolk

Features: PV system.

12. Renaissance Academy – 5100 Cleveland St., Virginia Beach

Features: geothermal heating/cooling, PV system, solar hot water system, day-lit classrooms, rain water used for flushing toilets, a 16,000 sq. foot green roof.

PV = Photovoltaic

13. Johnson Home - 8304 Ocean Front Ave., Virginia Beach

Features: **PV system, a control system to automatically open/close blinds.**

14. Solar Services, Inc – 877 Seahawk Circle, Va. Beach

Features: **PV system**.

There is a digital control system in the office remote from the system. A solar hot water system is installed in the office with BTU meter and digital control. This solar hot water system is the first in the country to be registered for the sale of renewable energy credits. For heating/cooling high efficiency mini split heat pump units were used. Recycled carpet and low VOC paints were applied when we finished out the building. We also have a demonstration gray-water recycling unit in the office and a demonstration roof is set up in the office to show a solar pool heating system.

15. The Mothership – 1921 Benecia Drive, Virginia Beach (*FollowPrincess Anne Road to Ashville Park Blvd; Go through the clock tower and look to the left.*

Features:**EarthCraft™, PV system, geothermal heating/cooling, gray-water recycling system, sealed crawl space.**

It has the lowest HERS Rating of any EarthCraft™ house in Virginia or Georgia. The electric system guarantees heating and cooling bills of no more than $115/month on average per year (so far, the power company owes the owner). The house has concrete construction designed to withstand hurricane-force winds. Recycled materials are used in various places around the house.

16. Elber Home - 213 Anne Burras Lane, Newport News

Features: **solar hot water system, PV system.**

17. Royer Technical Services - 1326 Chesapeake Ave., Hampton

Features: **wind turbine, 2 PV systems with computer interfaces for system monitoring.**

18. Cuker & Gerbing Home - 144 Alleghany Rd., Hampton

Features: **PV system, solar awning**

Solar electricity and cooling methods have reduced the electric utility bill by about half. Clothes lines were also installed on the back porch to replace the electric dryer.

19. Wright Home – 32 Riley's Way, Hampton

Features: **passive solar energy, energy efficient windows, solar water heater, eco-friendly décor, rain barrels**

There are no trees or obstructions from neighbors to block radiation and no obstructions. South-facing glazing area is about 6% of total floor area. West-facing window area is larger than usually recommended for esthetic reasons; north- and east-facing windows are minimized. Location in a flood zone requires the house to be elevated on pilings; the challenge is addressed by incorporating elevated 5" thick x 5' wide concrete slabs under the main floor solar windows, and then covering them with ceramic tile. Two 3-ton heat pumps supplement heat and A/C. These have SEER up to 15 and HSPF up to 9. Insulation of exterior surfaces is primarily cellulose. Roof overhangs reduce solar heating in the summer. Renewable bamboo flooring is used throughout and new carpeting minimized to reduce VOC.

20. Garden Atriums of Poquoson - #4 Garden Atrium Way, Poquoson -

Features: **"Net Zero" home, passive solar heating, PV system, rainwater harvesting, eco-friendly décor, Xeriscaping, day-lighting.**

The house is cluster zoned to maximize land use. It is heated 100% by passive solar heating, and 100% of the electricity needs are met by photovoltaics. 95% of the water needs are met via rainwater harvesting. No off-gassing materials were used; it has zero VOC paints, dye-free carpets, and solid wood cabinets. The CO_2 level is kept the same as outdoors via broad-leafed plants, and oxygen levels are much higher than outdoors. Air toxins are eliminated via indoor plants. The site is terraced to maximize water absorption; no irrigation is needed. Day-lighting is maximized for better eye health, and windows are minimized for improved sound insulation and quietness. Recycled granite veneers and wood floors are used throughout.

21. Ross-Clunis Home – 222 Landing Rd, Seaford –

Features: closed cell spray foam insulation (soy and recycled plastic), high efficiency gas heat pump with a fresh air recovery ventilator, high efficiency hurricane-rated windows and doors.

22. Ward Home – 168 Ruth Lane, Williamsburg

Features: solar water heater, PV system.