

**Northumberland Association for  
Progressive Stewardship**  
*welcomes you to*

# ***Solar in Northumberland***



**A program about cost-savings  
and other benefits from the use of  
Solar Energy in our community**

**Saturday, February 23, 2019  
Fellowship Hall  
Heathsville United Methodist Church  
Heathsville, Virginia**



# *Today's Program*

## **"Solar in Northumberland"**

★ **Welcome and Program Introduction/Solar Power Basics**  
*Mike Ahart, NAPS*

★ **Is Solar For You?**  
*Randy Hinman, Powur PBC*

★ **Evolution of a Residential PV System**  
*Bette & Roger Gruben*

★ **"Solar Schools Save Money" Proposal by the  
NMS 6th Grade "Community Problem Solvers"**  
*Ms. Shauna McCranie, introduction:*

Charlie Hapgood

Sanaa Thomas

Jesus Lopez

Jesus Ramirez

Leon Zarraga Dominquez

Kayla Baker

Ava Wilson

Tre Booth

Brayden Newsome

Olivia Byrd

Cooper Haynie

Lily Padgett

Olivia Newsome

Itzel Santamaria

Anne Shackelford

★ **School Power Purchase Agreements & Solar Curriculum**  
*Erik Curren, Secure Futures*

★ **NAPS Business Meeting – Treasurer's Report, 2019  
Initiatives, Election of Board Members**

# NAPS – Solar Stewardship

## The Language of Solar & Some Basics

Lee Allain, NAPS

**Why Solar?** – Your Home Economics & Planet Earth Sustainability

### **Energy typical use in your home**      *(1000 Watts = one kilowatt, 1 kW)*

Typical Home Power Level - 5 kW (kilowatts)

Energy equals the product of power in kW and hours used, kWh

Typical Home Energy use - 1,000 kWh/Month (kilowatt hours/month)

Average Power Co. rate - 12 cents per kWh

Average Bill @ 1,000 kWh/Month - \$120/Month

Example: One kWh will light a 100 Watt light bulb for 10 hours, run a 1000 Watt heater for an hour, or run an electric vehicle about 3 miles

### **Energy available from the Sun**

100 Watts/square foot, or about 1 kW/square meter

Average usable sunshine - 5 - 6 hours/day, or about 2000 hours/year

Typical Solar Array Efficiency < 20%

250 Square feet on your roof @ 20% efficiency = 5 kW

Angles in NN - 38 Degrees Elevation pointed south (not critical)

### **A typical Solar System**

Typical Photovoltaic Array Panels @ 250 Watts (about 2.5' X 5')

Number of panels to grab 5 kW - 20 panels (about 250 square feet)

Charge regulator to protect array and battery/inverter

Inverter(s) to turn DC power into AC

DC input, typically 12V DC

AC output - 110V AC

Modified Sine wave/ Sine wave output

Turn-on transient "head room"

Grid Tie - Net Metering

Option - Batteries to accommodate night time - Extra \$s

### **Installation Cost Guide**

Dollars/Watt - \$2-\$5 depending on appearance, efficiency, test features, etc.

5 kW Array @ \$4/Watt = \$20,000 minus 30% = \$14,000 (Until 2020)

Your home increases in value by \$14,000

Typical Warranted Life of Array - 20-25 years

Cost per kWh over life - < 8 Cents per kWh, Payback in about 10 years

Dominion/Co-Op rates WILL increase while your cost is fixed

*Considering Solar?  
Here's another great resource:  
Solar United Neighbors of VA*

Solar United Neighbors is the only organization in the country dedicated to representing the needs and interests of solar owners and supporters. See how it's been helping people go solar, join together, and fight for their energy rights since 2007. Solar United Neighbors is a 501(c)3 non-profit.

It is an active community keeping up on changes in the industry, technology, and legislation, plus a list-serve full of members who can help answer just about any question.

There is literature about SUN on a table in back, please help yourself.

Visit the national web site at **[solarunitedneighbors.org](http://solarunitedneighbors.org)**

Visit the Virginia web site at **[solarunitedneighbors.org/virginia/](http://solarunitedneighbors.org/virginia/)**



# References and Contacts

## Presenters

Mike Ahart, President, NAPS: [mikeahart@NAPSva.org](mailto:mikeahart@NAPSva.org), 804-313-0274, [NAPSva.org](http://NAPSva.org)

Randy Hinman, Senior Solar Advisor, Powur PBC:

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Bette & Roger Gruben: [rogergruben@gmail.com](mailto:rogergruben@gmail.com), 804-450-0177, [NAPSva.org](http://NAPSva.org)

Shauna McCranie, TAG Student Coordinator: [smccranie@nucps.net](mailto:smccranie@nucps.net), 804-580-8032

Erik Curren, Chief Marketing and Bus. Dev. Officer, Secure Futures

[erik@securefutures.solar](mailto:erik@securefutures.solar), (540) 466-6128, [securefutures.solar](http://securefutures.solar)

## From NMS 6th-Grade Community Problem Solvers Presentation:

Press Release: Middlesex County Public Schools Saves \$2.6M Through Record-low 6.84¢/kWh Solar PPA - <https://www.prweb.com/releases/2017/11/prweb14912871.htm>

Article: Sun Tribe Solar and Westmoreland County Public Schools partner to develop the first pollinator-friendly solar farm for the Virginia Public School system - [https://www.suntribesolar.com/single-post/2018/10/17/Sun-Tribe-Solar-and-Westmoreland-County-Public-Schools-partner-to-develop-the-first-pollinator-friendly-solar-farm-for-the-Virginia-Public-School-system?hid=09445286E626F3260C72DAD70855F5B1&wordfence\\_logHuman=1](https://www.suntribesolar.com/single-post/2018/10/17/Sun-Tribe-Solar-and-Westmoreland-County-Public-Schools-partner-to-develop-the-first-pollinator-friendly-solar-farm-for-the-Virginia-Public-School-system?hid=09445286E626F3260C72DAD70855F5B1&wordfence_logHuman=1)

Video: Middlesex County Public Schools Solar Farm - [https://www.youtube.com/watch?v=A\\_Gnwo-rxVI](https://www.youtube.com/watch?v=A_Gnwo-rxVI)

Article: Virginia solar and wind Power Purchase Agreement (PPA) pilot program in Dominion Power service territory - [securefutures.solar/virginia-to-begin-pilot-ppa-program/](http://securefutures.solar/virginia-to-begin-pilot-ppa-program/)

The National Energy Education Development (NEED) project - [need.org/curriculum](http://need.org/curriculum)

RVA Solar Fund solar school grant program - [rvasolarfund.org](http://rvasolarfund.org)

Lee Allain, NAPS STEM/Solar project coordinator - 804-529-5491, [Leeallain7@gmail.com](mailto:Leeallain7@gmail.com)

Tony Stephan, Education Market Manager, Sun Tribe Solar - 703-967-8479, [tony.stephan@suntribesolar.com](mailto:tony.stephan@suntribesolar.com)

## Residential Solar Installers (partial list):

Prospect Solar: [prospectsolar.com](http://prospectsolar.com)

Ipsun Solar: [ipsunsolar.com](http://ipsunsolar.com)

P.E.G Solar: [PEGsolar.com](http://PEGsolar.com)

Teakwood Solar: [trent@teakwoodinc.com](mailto:trent@teakwoodinc.com), [teakwoodinc.com](http://teakwoodinc.com)

Arthur Fichter Solar Services: [Arthur@solarservices.com](mailto:Arthur@solarservices.com), [solarservices.com](http://solarservices.com)

Sigora Solar: [drew.gallagher@sigorasolar.com](mailto:drew.gallagher@sigorasolar.com), [sigorasolar.com](http://sigorasolar.com)

# NAPS MEMBERSHIP APPLICATION

Please fill out application and make check payable to  
“NAPS” and mail to:

NAPS  
P.O. Box 567  
Heathsville, VA 22473



Name(s) \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone (\_\_\_\_\_) \_\_\_\_\_ Fax (\_\_\_\_\_) \_\_\_\_\_

E-mail \_\_\_\_\_

Membership Category\* (check one):

- |  |  |
|--|--|
| <input type="checkbox"/> Individual \$15 | <input type="checkbox"/> Sustaining \$100              |
| <input type="checkbox"/> Family \$25     | <input type="checkbox"/> Patron \$250                  |
| <input type="checkbox"/> Student \$1     | <input type="checkbox"/> Business \$ _____ (min. \$50) |

***I would like to participate in:***

- |                                |                                   |
|--------------------------------|-----------------------------------|
| _____ Adopt-A-Highway          | _____ Creek Cleanup               |
| _____ Environmental Education  | _____ NAPS Exhibits               |
| _____ Finance                  | _____ Phragmites Problems         |
| _____ Fund Raising             | _____ Publicity and Newsletter    |
| _____ Grass Planting           | _____ Special Events Coordination |
| _____ Monitoring County Boards | _____ Any Project Assignments     |
| _____ Membership               | _____ Other _____                 |

\* The Internal Revenue Service has determined that NAPS qualifies as a tax-exempt organization under section 501 (c) (3) of the code. As such, dues and contributions to NAPS may be deductible by donor for tax purposes.

## Save the date!



# NAPS Earth Day Festival 2019

## Saturday, April 20

### Heathsville Farmers Market, 9am-1pm