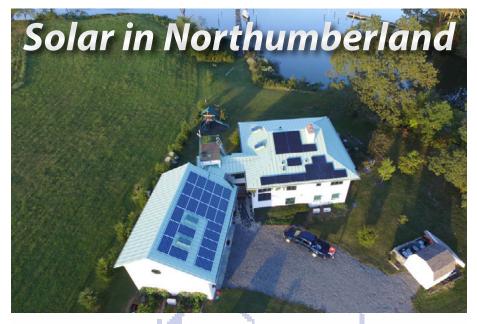
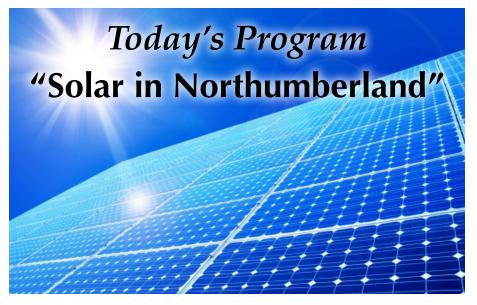
### Northumberland Association for Progressive Stewardship

welcomes you to



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



- 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 Shackleford

#### 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 nonprofit.

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** 

Visit the Virginia web site at **solarunitedneighbors.org/** virginia/



### **References and Contacts**

#### <u>Presenters</u>

- Mike Ahart, President, NAPS: mikeahart@NAPSva.org, 804-313-0274, NAPSva.org
- Randy Hinman, Senior Solar Advisor, Powur PBC: rjhinman2015@gmail.com, 804-218-7006, powur.com/randy.hinman/getsolar/
- Bette & Roger Gruben: rogergruben@gmail.com, 804-450-0177, NAPSva.org
- Shauna McCranie, TAG Student Coordinator: smccranie@nucps.net, 804-580-8032
- Erik Curren, Chief Marketing and Bus. Dev. Officer, Secure Futures erik@securefutures.solar, (540) 466-6128, securefutures.solar
- From NMS 6th-Grade Community Problem Solvers Presentation:
  - Press Release: Middlesex County Public Schools Saves \$2.6M Through Record-low 6.84<sup>[2]</sup>/ 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-solarfarm-for-the-Virginia-Public-School-system?hid=09445286E626F3260C72DAD70 855F5B1&wordfence\_logHuman=1
  - Video: Middlesex County Public Schools Solar Farm 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-ppaprogram/
  - The National Energy Education Development (NEED) project need.org/curriculum
  - RVA Solar Fund solar school grant program rvasolarfund.org
  - Lee Allain, NAPS STEM/Solar project coordinator 804-529-5491, Leeallain7@gmail.com
  - Tony Stephan, Education Market Manager, Sun Tribe Solar 703-967-8479, tony. stephan@suntribesolar.com

Residential Solar Installers (partial list):

Prospect Solar: prospectsolar.com

Ipsun Solar: ipsunsolar.com

P.E.G Solar: PEGsolar.com

Teakwood Solar: trent@teakwoodinc.com, teakwoodinc.com

Arthur Fichter Solar Services: Arthur@solarservices.com, solarservices.com

Sigora Solar: drew.gallagher@sigorasolar.com, sigorasolar.com

NAPS MEMBERSHIP APPLICATION	
Please fill out application and "NAPS" and mail to: NAPS P.O. Box 567 Heathsville, VA 22	NADO.
Name(s)	
Address	
City	State Zip
	Fax ()
E-mail	
Membership Category* (che	eck one):
<ul> <li>Individual \$15</li> <li>Family \$25</li> <li>Student \$1</li> </ul>	<ul> <li>Sustaining \$100</li> <li>Patron \$250</li> <li>Business \$ (min. \$50)</li> </ul>
I would like to participate in: Adopt-A-Highway Environmental Education Finance Fund Raising Grass Planting Monitoring County Boards Membership	Creek Cleanup NAPS Exhibits Phragmites Problems Publicity and Newsletter Special Events Coordination Any Project Assignments 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