

Leveraging Utility Efficiency Programs to Promote Passive House Construction

The logo for Performance Systems Development is a dark green rectangle with a white border. Inside the rectangle, the words "PERFORMANCE SYSTEMS" are written in white, uppercase letters on the top line, and "DEVELOPMENT" is written in white, uppercase letters on the bottom line. The background of the slide features a decorative graphic of three curved, overlapping bands in shades of green and blue that flow from the left and right sides towards the center, framing the logo.

PERFORMANCE SYSTEMS
DEVELOPMENT

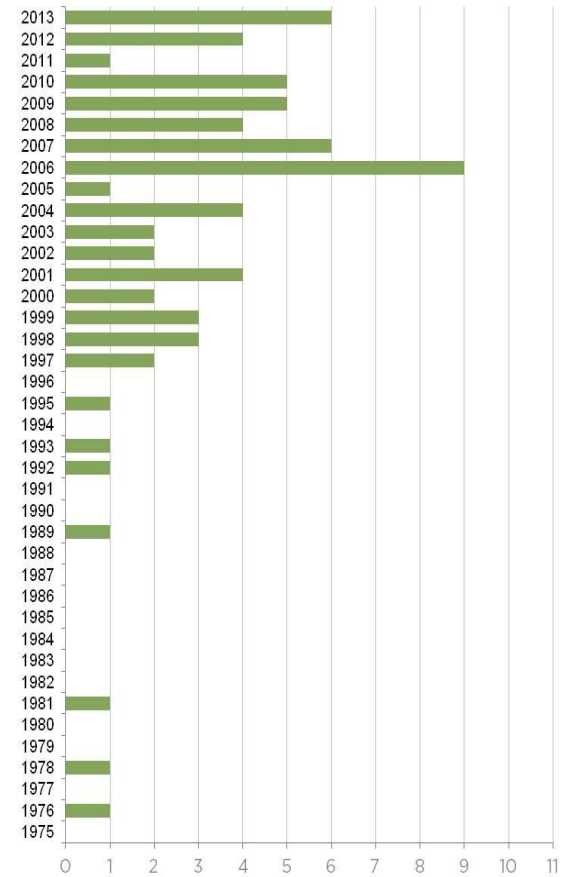
8th Annual North America Passive House Conference Pittsburgh PA 2013

Jim Phelps, CPHC
Quality Assurance Manager
jphelps@psdconsulting.com

Rob Shearer, NCARB, LEED AP,
Program Coordinator
rshearer@psdconsulting.com

Utility Incentive Programs

- Many states have enacted legislation to reduce the load on the energy grid.
 - In order to comply, utilities propose portfolios of programs to the State Public Utilities Commissions
 - Generally occur in cycles, one to five years is typical.
 - Utilities realized that there are energy savings to be claimed by incenting builders to build to standards better than current codes.



Residential Energy Efficient New Homes Programs, Ohio and Pennsylvania



Ohio Edison • The Illuminating Company • Toledo Edison

Met-Ed®

Penelec®

Penn Power®

West Penn Power®

FirstEnergy Companies

*FirstEnergy Program Numbers to
Date (PA: October 2009,
Ohio: March 2011)*

Savings of over 11,000 MWh

More than \$3.67 million in
incentives distributed

Over 3,800 approved homes.

Minimum Qualifications

- ENERGY STAR® certified
- 15% more efficient than code under which it was permitted
- Certificate of Occupancy date after program inception
 - Ohio: March 2011
 - Penn Power, Penelec, Met-Ed: October 2009,
 - West Penn Power: June 2013
- Serviced by a FirstEnergy utility

Eligible Service Territories-PA

PennPower
A FirstEnergy Company

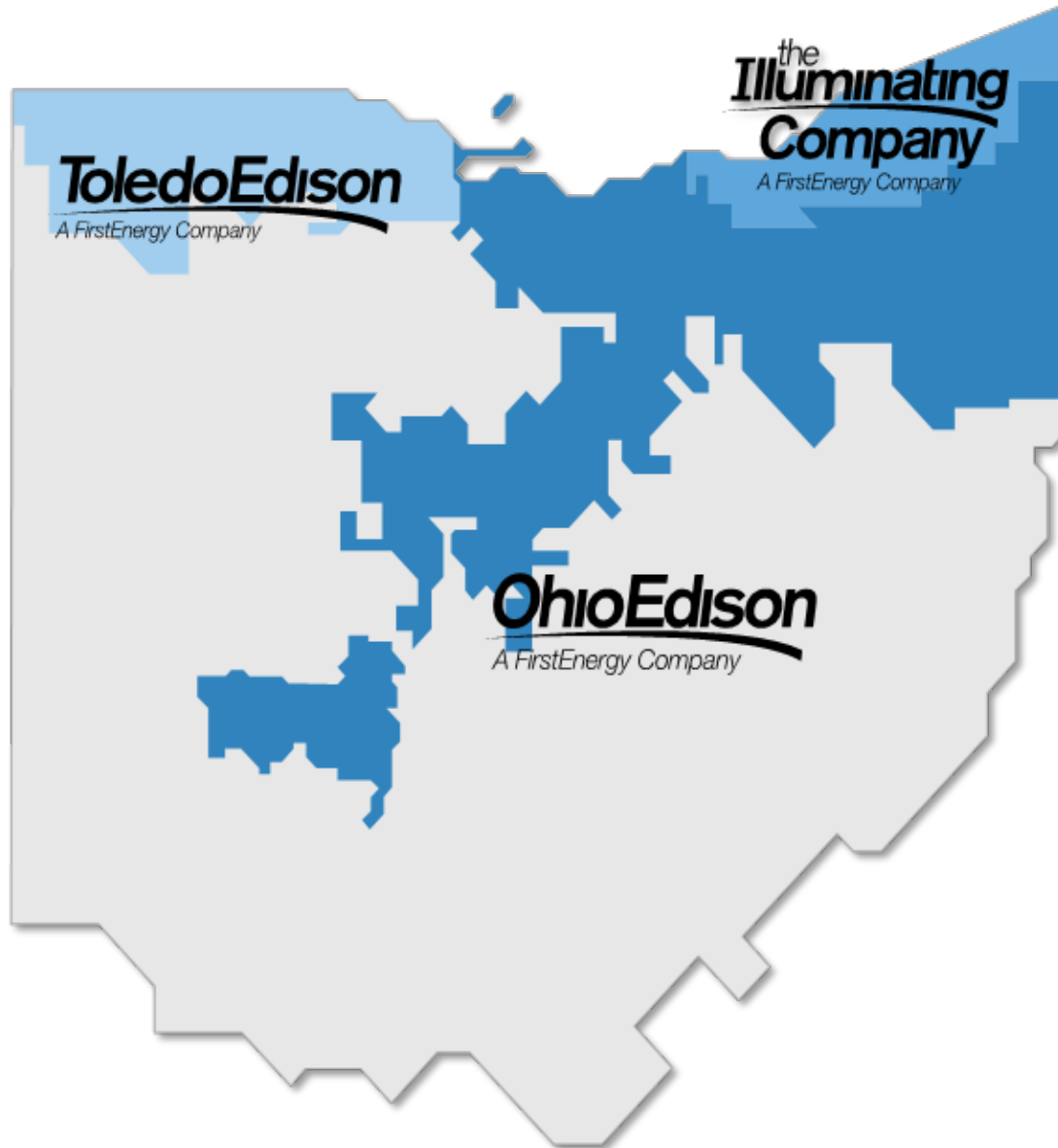
**WestPenn
Power**
A FirstEnergy Company

Penelec
A FirstEnergy Company

Met-Ed
A FirstEnergy Company



Eligible Service Territories-Ohio



<http://www.dsireusa.org/>

<http://energy.gov/savings>

Check your gas and electric utility websites

How to find a program near you



The screenshot shows the DSIRE website header with the logo 'DSIRE™ Database of State Incentives for Renewables & Efficiency'. It also features the U.S. Department of Energy logo and the IREC logo. A navigation menu includes Home, Glossary, Links, FAQs, Contact, About, and social media icons.



The screenshot shows the ENERGY.GOV website. The top navigation bar includes PUBLIC SERVICES, SCIENCE & INNOVATION, MISSION, and News & Blog. Below this is a search bar and a navigation menu with Home, My Account, Service Requests, Customer Choice, Outages, Safety, Save Energy, Products, and Help. The main content area is titled 'Save Energy' and 'Ohio'. It includes a sidebar with 'Ohio' and 'For Your Home / For Your Business' links. The main text describes energy efficiency programs and lists 'Incentive Programs' such as Home Energy Analyzer, HVAC Incentives*, Appliance Turn-In Program*, Energy Efficiency Products Program*, Easy Cool Rewards*, Energy Audit*, Energy Efficient New Homes*, Energy Conservation Kit*, and Lighting Discount Program*. A 'Need Help? Energy-Saving Tips' section features a 'Home Energy Analyzer' advertisement with the text 'MAKE YOUR METER happy WITH THE Home Energy Analyzer' and a 'GET STARTED' button.

<http://www.dsireusa.org/>



FEDERAL

Incentives/Policies for Renewables & Efficiency



Energy-Efficient New Homes Tax Credit for Home Builders



Last DSIRE Review: 01/04/2013

Program Overview:

State:	Federal
Incentive Type:	Corporate Tax Credit
Eligible Efficiency Technologies:	Comprehensive Measures/Whole Building
Applicable Sectors:	Construction
Amount:	\$1,000 - \$2,000 (depends on energy savings and home type)
Maximum Incentive:	\$2,000
Start Date:	1/1/2006
Expiration Date:	12/31/2013
Authority 1:	26 USC § 45L
Date Enacted:	08/08/2005 (subsequently amended)
Expiration Date:	12/31/2013
Authority 2:	H.R. 8 (American Taxpayer Relief Act of 2012)
Date Enacted:	01/02/2013
Date Effective:	01/02/2013
Expiration Date:	12/31/2013

Summary:

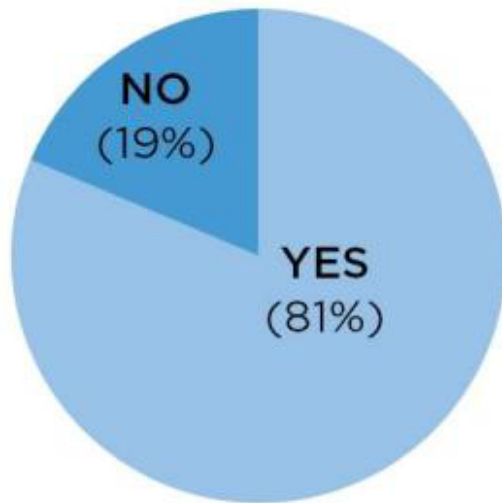
Personal Exemption

- [Residential Energy Conservation Subsidy Exclusion \(Personal\)](#)

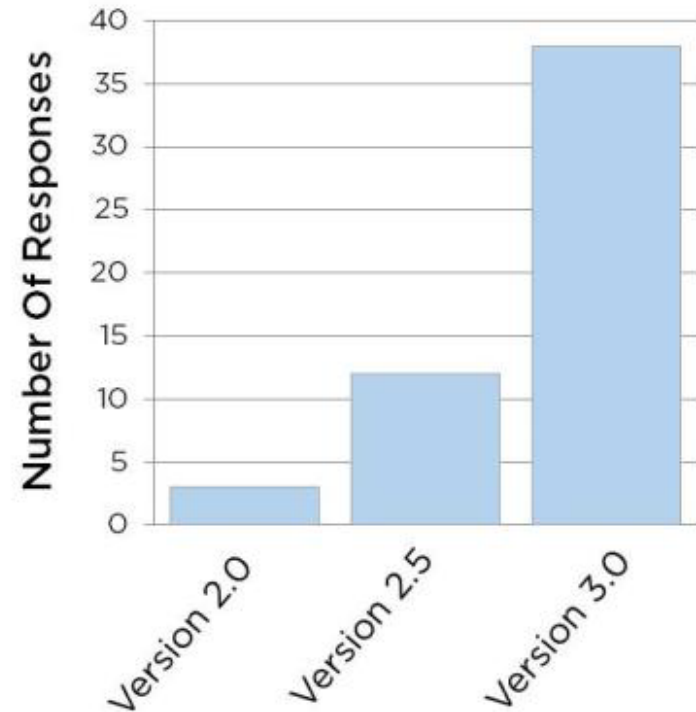
Personal Tax Credit

- [Residential Energy Efficiency Tax Credit](#)
- [Residential Renewable Energy Tax Credit](#)

Use of ENERGY STAR IN New Homes Programs



Of The YES



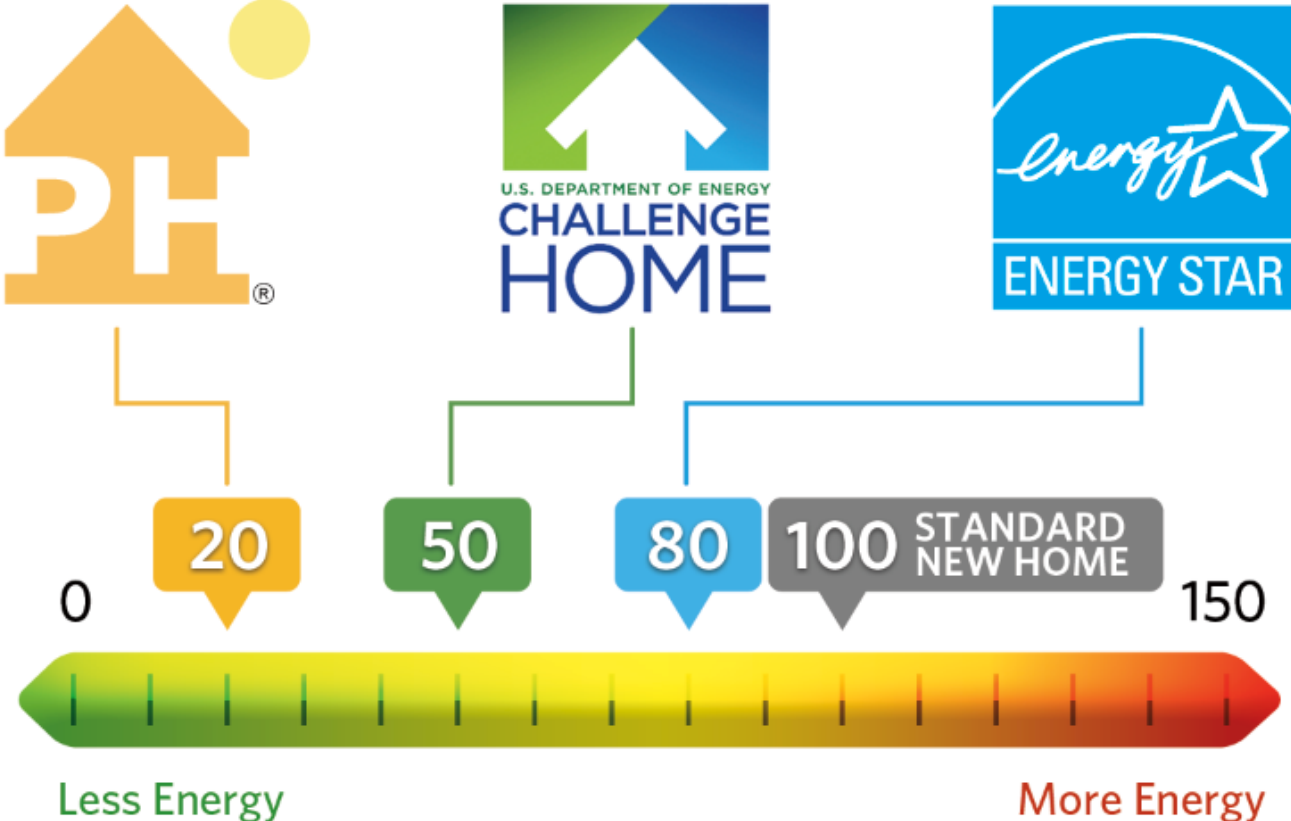
Source: http://library.cee1.org/sites/default/files/library/10911/CEE_NewHomesProgramOverview_Aug2013.pdf

PHIUS+Certification and DOE Challenge Partnership

Brief History

- **Feb 17th 2011** – RESNET enters partnership with PHIUS
 - **December 2011**- First PHIUS+ Rater training program
 - **August 20th 2012** – DOE Challenge enters partnership with PHIUS
 - **Starting in 2013** – PHIUS+ earns U.S. DOE Challenge Home and ENERGY STAR certification.
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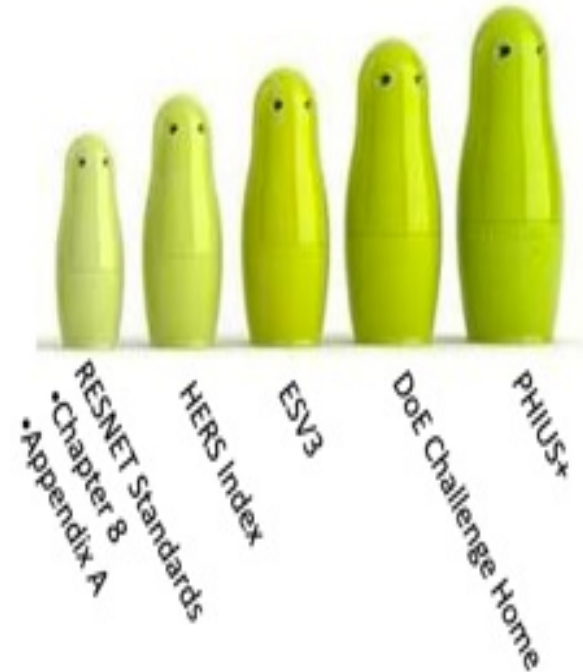
How do they compare?



PHIUS+ Certification and DOE Challenge Partnership

Benefits for PHIUS+ Projects

- Additional market recognition
- Multiple program elements
- Triple-label recognition
- Financial incentives through the HERS index
- Nationwide exposure



Program Mandatory Requirements



ES Version 3

- **ES3: Thermal Enclosure System**
- **ES3: Heating, Ventilation, & Air Conditioning system**
- **ES: Water Management**
- **Target HERS Index**
- **Third party QA/QC**



DOE Challenge Home rev 03

- **ES3: Thermal Enclosure System**
- **ES3: Heating, Ventilation, & Air Conditioning system**
- **ES: Water Management**
- **IECC 2012 Insulation**
- **Duct inside**
- **Efficient DHW delivery**
- **80% ES Lighting**
- **EPA Indoor Air Plus**
- **EPA Solar ready**
- **Target HERS Index**
- **Third party QA/QC**



PHIUS+ Certification

- **PHIUS Pre-Certification**
- **ES3: Thermal Enclosure System**
- **ES3: Heating, Ventilation, & Air Conditioning system**
- **ES: Water Management**
- **Ventilation Distribution**
- ***IECC 2012 Insulation**
- ***Duct inside**
- ***Efficient DHW delivery**
- ***80% ES Lighting**
- **EPA Indoor Air Plus**
- **EPA Solar ready**
- **Target HERS Index**
- **Third party QA/QC**
- **PHIUS specific QA/QC**

How can programs support advanced performance homes?

- **Utility Sponsorship**
- **Marketing**
- **Informational and training webinars**
- **Technical Support**



Incentives



Common Program Structures

Tiered program-% efficiency above code

- Increased incentives at 15%, 30%, 45%, etc.
 - Typically do not go beyond 45% or so.
 - Built in “Cap” at highest tier.

Tiered program-HERS Score

- Increased incentives at 80, 60, 50, etc.
 - Typically do not go beyond 50
 - Built in “Cap” at highest tier.

Prescriptive Incentives

- Per HVAC unit efficiency, % CFL's, Geothermal, solar, etc



Programs often have “bonuses” for certifications, such as ES, LEED. PH could be an additional “bonus tier.”

Incentive structure

FirstEnergy's Energy Efficient New Homes Program

- **Performance Based** incentive structure
 - \$400 per unit + \$0.10/kWh in projected savings
 - Greater savings = higher incentive.
 - No Cap



Program benefits

Why does embracing PH buildings make sense for the utility, in a performance based model?



= 3000 kWh/year



= 30,000 kWh/year



$= (\$400 + \$300) * 10 =$
\$7,000 in incentives



$= (\$400 + \$3000)$

$= \$3,400$ in incentives

Future structure?

Tiered Performance structure.



= \$400 + \$.10 /kWh



= \$600? + \$.10 /kWh



= \$1000? + \$.10/kWh

Passive construction in our Program



Strauss Residence

- **Builder:** Berges LLC
- **HERS Rater:** Residential Energy Services Company
- **Location:** Rocky River, Ohio
- **Year Built:** 2012

Passive construction in our Program

Strauss Residence

- **R-20 Slab**
- **R-22 Foundation Wall**
- **R-35 Above Grade Wall**
- **R-5.5 Windows**
- **R-55 Roof**
- **Ultimate Air Ventilation System**
- **Mini-split ASAP**
- **Air-tightness 0.6 ACH50**



Passive construction in our Program



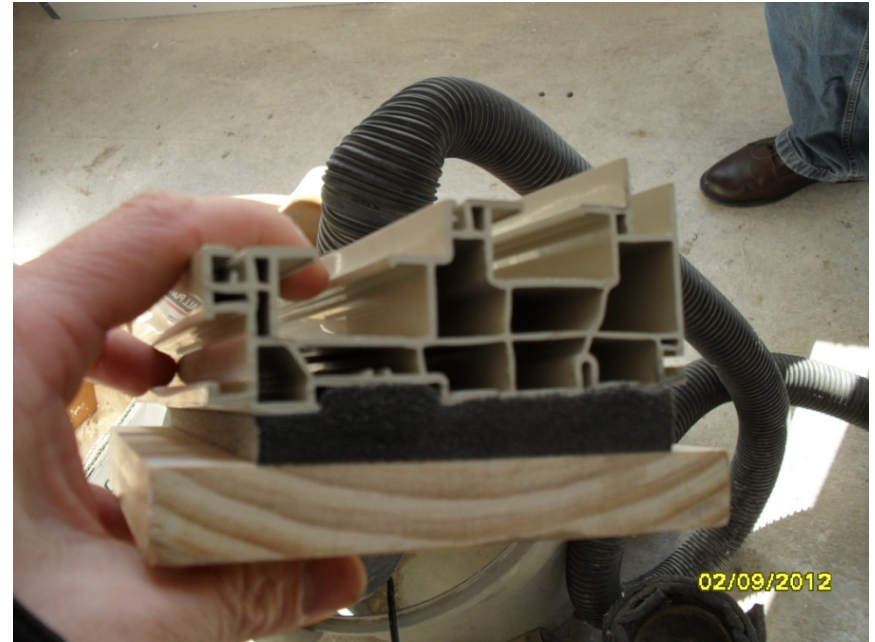
Nissen-Butler residence, Cleveland, Ohio

- **Builder:** Berges LLC
- **HERS Rater:** Residential Energy Services Company
- **Location:** Cleveland OH
- **Year built:** 2012

Passive construction in our Program

Nissen–Butler Home

- R-40 Slab
- R-52 Foundation Wall
- R-55 Above Grade Wall
- R-11 Windows
- R-69 Roof
- Zehnder Ventilation System
- Solar thermal & PV
- Mini-split ASAP
- Air-tightness 0.3 ACH50



Passive construction in our Program

Do you want to know more...



Incentive structure



Nissen-Butler residence, Cleveland, Ohio

- HERS Score of 15
- 84.4% savings above code
- Predicted savings of 33,384 kWh annually over reference home
- Incentive calc:
 $\$400 + (33,384 \times .10) =$
 $\$3,738.40 = 5.75$ times
average program incentive .



Strauss Residence, Rocky River, Ohio

- HERS Score of 38
- 50.6% savings above code
- Predicted savings of 16,099 kWh annually over reference home
- Incentive calc: $\$400 + (16,099 \times .10) =$
 $\$2,009.90 = 3.0$ times
average program incentive .

Lessons Learned

- *Typical program designs are not a “one size fits all”*
- *Predicted vs. metered energy use*
- *Additional QA/QC requirement for Passive House buildings.*
- *Rater certification and modeling*
- *“Uncapping” incentives to support high efficiency homes*

What are the next steps?



PERFORMANCE SYSTEMS DEVELOPMENT

Thank You

Jim Phelps, CPHC
Quality Assurance Manager
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