



## Innovative Financing Tools for Energy Efficient Buildings

How to do energy efficiency retrofits with low up-front financing costs



# LOW/NO CARBON ENERGY INVESTMENTS AT SCALE A SUSTAINABLE ENERGY UTILITY STRATEGY

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Foundation for Renewable Energy and Environment

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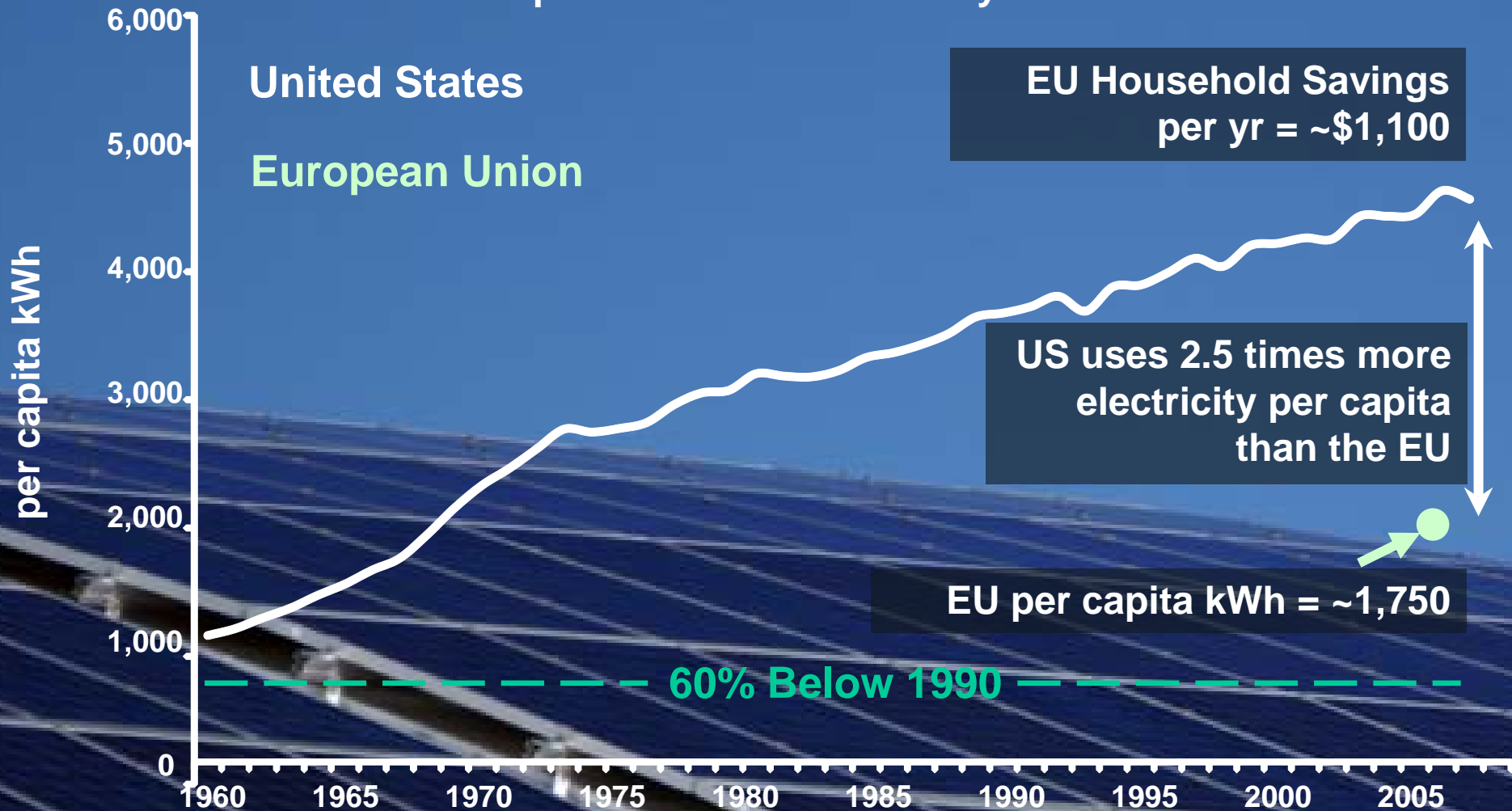
## Mission & Organization

The *FOUNDATION FOR RENEWABLE ENERGY AND ENVIRONMENT* is a non-profit, international organization established to promote a better future based on energy, water and materials conservation, renewable energy use, environmental resilience, and sustainable livelihoods.

- FREE was founded in 2011 by Dr. John Byrne, Director and Distinguished Professor of Energy and Climate Policy Center for Energy & Environmental Policy, University of Delaware, Ken Becker of Becker Capital, and Maya Stendhal of Madison Global Advisors.
- A unique feature of FREE is its ability to harness the creativity and bandwidth of expertise of an evolving network of more than 300 specialists in law, finance, economics, energy technology, environmental protection, and urban planning who are active in over 40 countries. These FREE Minds are a vital resource enabling the Foundation to address the pressing issues of our era with the sort of in-depth and diverse thinking they require.

# U.S. Energy Obesity

Per capita residential electricity use

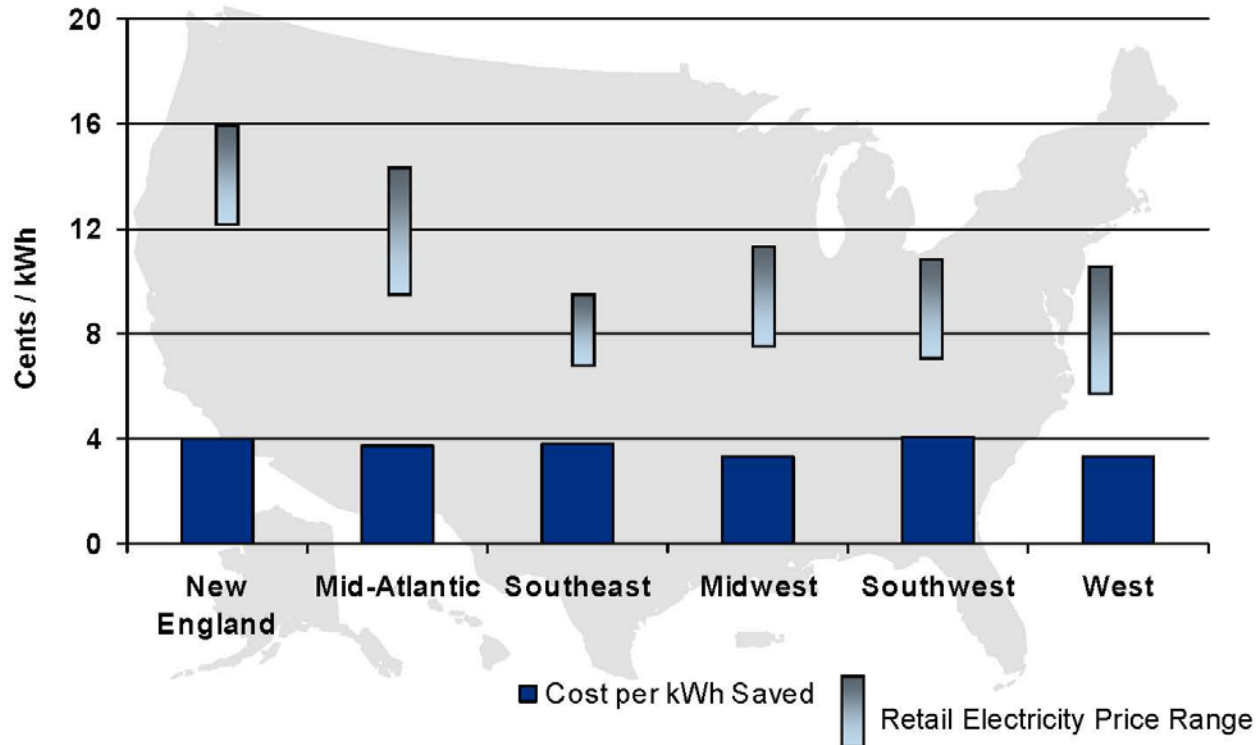


EIA, 2011 State Energy Data System (SEDS); U.S. Census Bureau, 2011, 2007, 2000, 1990

# The “Negawatt” – not consuming

The cost of saving energy is significantly less than electricity rates throughout the U.S.

## Cost per kWh vs Cost per nWh



Source: Erhardt-Martinez & Laitner (2008) *The Size of the U.S. Energy Efficiency Market*. ACEEE.

# GREEN JOBS: THE SUSTAINABLE ENERGY ADVANTAGE



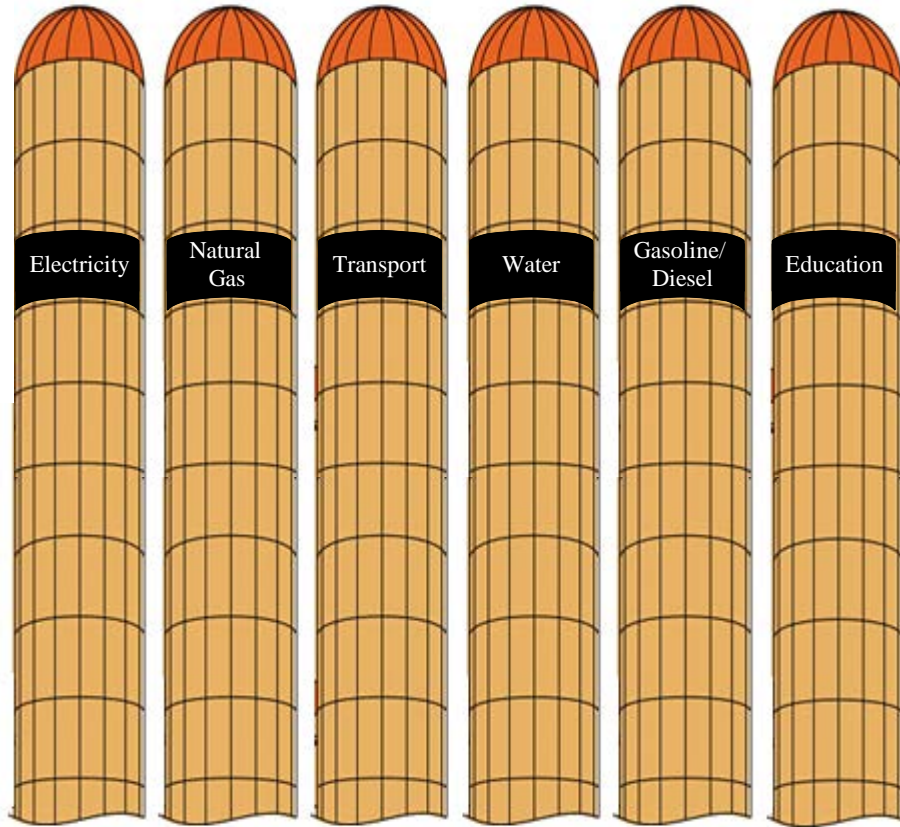
## Permanent Jobs Created per Million US\$ Invested

<b>COAL PLANTS</b>	<b>4</b>
<b>ENERGY EFFICIENCY &amp; CONSERVATION</b>	<b>12-15</b>
Smart/Green Buildings	14.7
Air Sealing / Insulation	12.0
<b>RENEWABLE ENERGY</b>	<b>10-19</b>
Solar Thermal	19.0
Solar Electric (PV)	15.7
Wind	11.9
Geothermal	10.5
<b>INFORMATION &amp; COMMUNICATION TECHNOLOGY</b>	<b>18-26</b>
High-Speed Broadband	26.4
Smart Grid	21.7
Intelligent Transport	17.7

Sources: Erhardt-Martinez & Laitner, *The Size of the U.S. Energy Efficiency Market*. ACEEE. 2008. American Solar Energy Society (ASES). *Renewable Energy and Energy Efficiency: Economic Drivers for the 21st Century*. 2007. Singh & Fehrs, *The Work that Goes into Renewable Energy*. REPP. 2001. London School of Economics (LSE) and the information Technology and Innovation Foundation (ITIF). *The UK's Digital Road to Recovery*. 2009. ICT job creation does not include 'network effects.'

# SHIFTING THE ENERGY PARADIGM: THE SUSTAINABLE ENERGY UTILITY MODEL

Old Model



New Model



# SNAPSHOT OF THE DELAWARE SEU ENERGY EFFICIENCY BOND SERIES

TRANSACTION: TAX-EXEMPT BOND SOLD ON AUGUST 1, 2011 AA+ by S&P

PAR VALUE = \$67.45 MILLION WITH PREMIUMS = \$72.55 MILLION

SERIAL BONDS: maturities from 1 year (borrowing rate = 0.65%) to 20 years (rate = 4.37%)

EFFECTIVE BORROWING RATE = 3.67%

AVERAGE SIMPLE PAYBACK PERIOD: ~ 14 yrs

SIX STATE PARTICIPANTS	BOND PROCEEDS (incl. Premium)
Department of Children, Youth and Their Families	\$ 1.667 million
Department of Correction	\$39.699 million
Department of Natural Resources and Environmental Control & Carvel State Office Building	\$ 6.205 million
Legislative Hall, State of Delaware	\$ 5.199 million
State Courthouse	\$ 1.012 million

## TWO HIGHER EDUCATION INSTITUTIONS

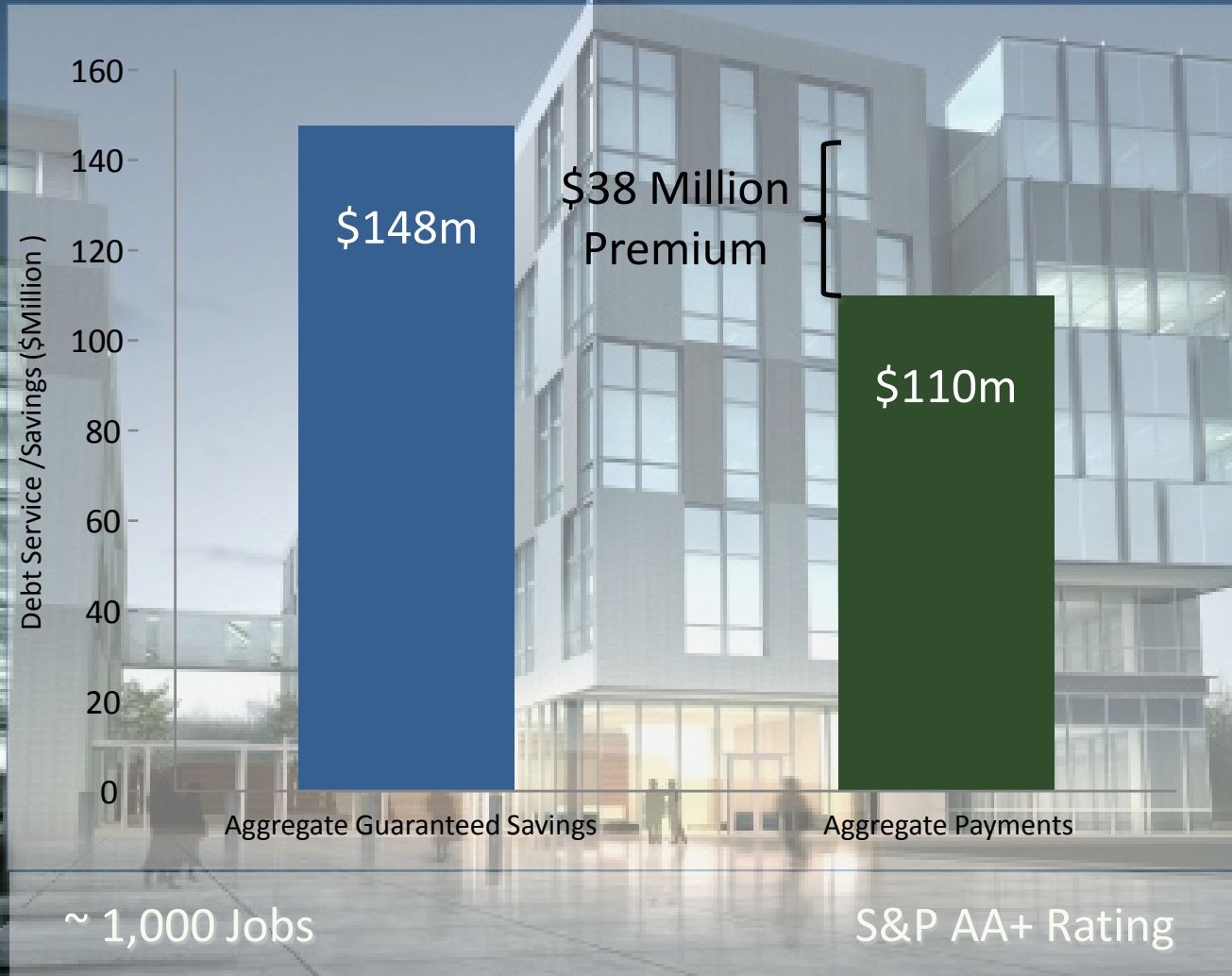
Delaware State University	\$12.108 million
Delaware Technical and Community College (3 campuses)	\$ 6.661 million

SIX ESCOs : Ameresco, Honeywell, Johnson Controls, Noresco, Pepco Energy Services, Trane

MAJOR BUYERS: Definitive Capital, Lord Abbott, First New York Securities, Merrill Lynch

# SCALING UP NEGAWATT INVESTMENTS

## The Delaware SEU Bond – Market Transformation





# Top Ten States by Per capita installed PV Capacity

TOP TEN	Cumulative Installed PV Capacity per person (W <sub>DC</sub> /person)
1. California	20.8
2. Hawaii	20.2
3. <b>DELAWARE</b>	<b>17.9</b>
4. New Jersey	14.6
5. Nevada	13.8
6. Colorado	11.8
7. Arizona	7.0
8. Connecticut	5.6
9. Oregon	3.7
10. Vermont	2.7
US Average	4.2

Data Source: Interstate Renewable Energy Council (IREC) *U.S. Solar Market Trends*.



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# SUSTAINABLE ENERGY AS AN INFRASTRUCTURE INVESTMENT

## *FREE*'s SUSTAINABLE ENERGY FINANCE ADVISORY SERVICE

The **Sustainable Energy Utility (SEU)** is an innovative public-private partnership exclusively delivering renewable energy and conservation services

**Implemented in:**

- Delaware
- Vermont
- Washington, DC
- Sonoma County, CA

**In development**

- CSCDA
- Applied Solutions
- Seoul, S. Korea
- China & India

*FREE*'s Education and Advisory Service (EAS) works with communities across the country and beyond to take advantage of the SEU model and its successful implementation in Delaware and other jurisdictions.

<http://freefutures.org/seu-initiative/education-and-advisory-service>





The White House

Office of the Press Secretary

For Immediate Release

December 02, 2011

## We Can't Wait: President Obama Announces Nearly \$4 Billion Investment in Energy Upgrades to Public and Private Buildings

In the White House press release on the President's *Better Buildings Challenge*, the Delaware & Washington DC SEUs were recognized for accomplishments meriting national attention.



At the 6<sup>th</sup> Clean Energy Summit in Manila (2011), the Asian Development Bank recommended the SEU Model to the region's policy-makers.

# SUSTAINABLE ENERGY FINANCE PROGRAM

**NO NEW LEGISLATION OR NEW PROGRAM APPROPRIATIONS REQUIRED**

**FOCUS:** MUNICIPAL AND NON-PROFIT CREDITS

**TRANSACTION:** TAX-EXEMPT BOND FINANCING OF SUSTAINABLE ENERGY INVESTMENTS  
(based on demonstrated market success of the SEU Energy Efficiency Bond Series)  
LOW-COST FINANCING WHICH INCENTIVIZES 'DEEP RETROFIT' CHOICES  
AMONG THE BEST & FASTEST MEANS TO CREATE JOBS (4X more jobs per  
million\$ invested compared to conventional energy projects)

**FEATURES:**

- CUSTOMIZABLE TO LOCAL CONDITIONS
- NET SAVINGS ACCRUE TO PUBLIC PARTICIPANTS
- \$\$\$\$-DENOMINATED VERIFIABLE ENERGY SAVINGS
- PRE-APPROVED ESCOs
- COMMON DOCUMENTS
- MONITORING & VERIFICATION PROTOCOLS THAT SUPPORT PARTICIPANT GOALS
- LOW COST CAPITALIZATION OF E-E OPPORTUNITIES (by taking advantage of pooling and standardized transaction model of the SEU)

# SUSTAINABLE ENERGY FINANCE PROGRAM

## FREE Team

- **Team Lead:** **Dr. John Byrne**  
**FREE co-founder and**  
**Chairman of the Board**
- **Financial Advisor:** **Ken Becker**  
**Becker Capital and Finance and**  
**FREE co-founder**
- **Program Counsel:** **Baird Brown**  
**Drinker Biddle & Reath**



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<http://freefutures.org>

<http://freefutures.org/seu-initiative/free-sustainable-energy-financing-advisory-service>

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