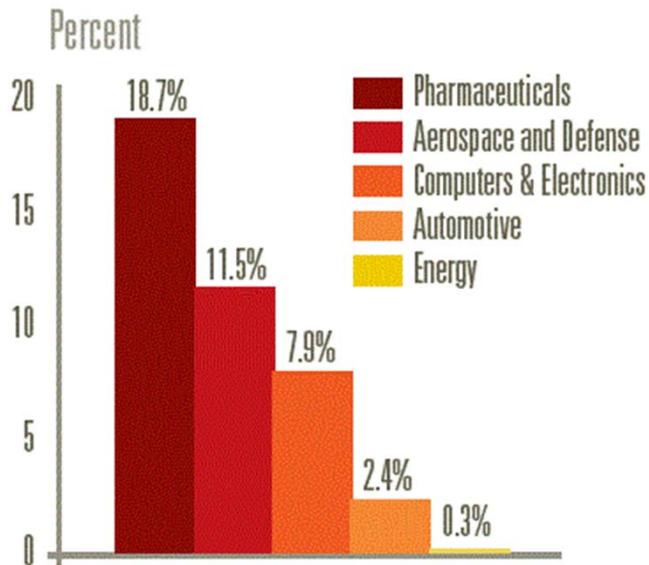


eeb
HUB Energy
Efficient
Buildings
Hub

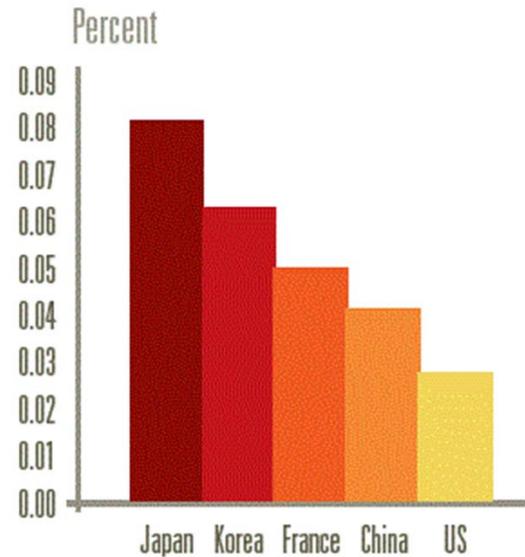
US Government Must Fill the R&D Gap: Market Failure

R&D Spending as a Share of Sales



Of all major technology-dependent sectors, the energy sector spends the smallest portion of its sales on research and development.¹

Public Energy RD&D Spending as a Share of GDP, 2007



Among its major trading partners and competitors, the United States spends the smallest fraction of its GDP on energy RD&D.⁷

“A Business Plan for America’s Energy Future,” American Energy Innovation Council.

<http://www.americanenergyinnovation.org/full-report/>

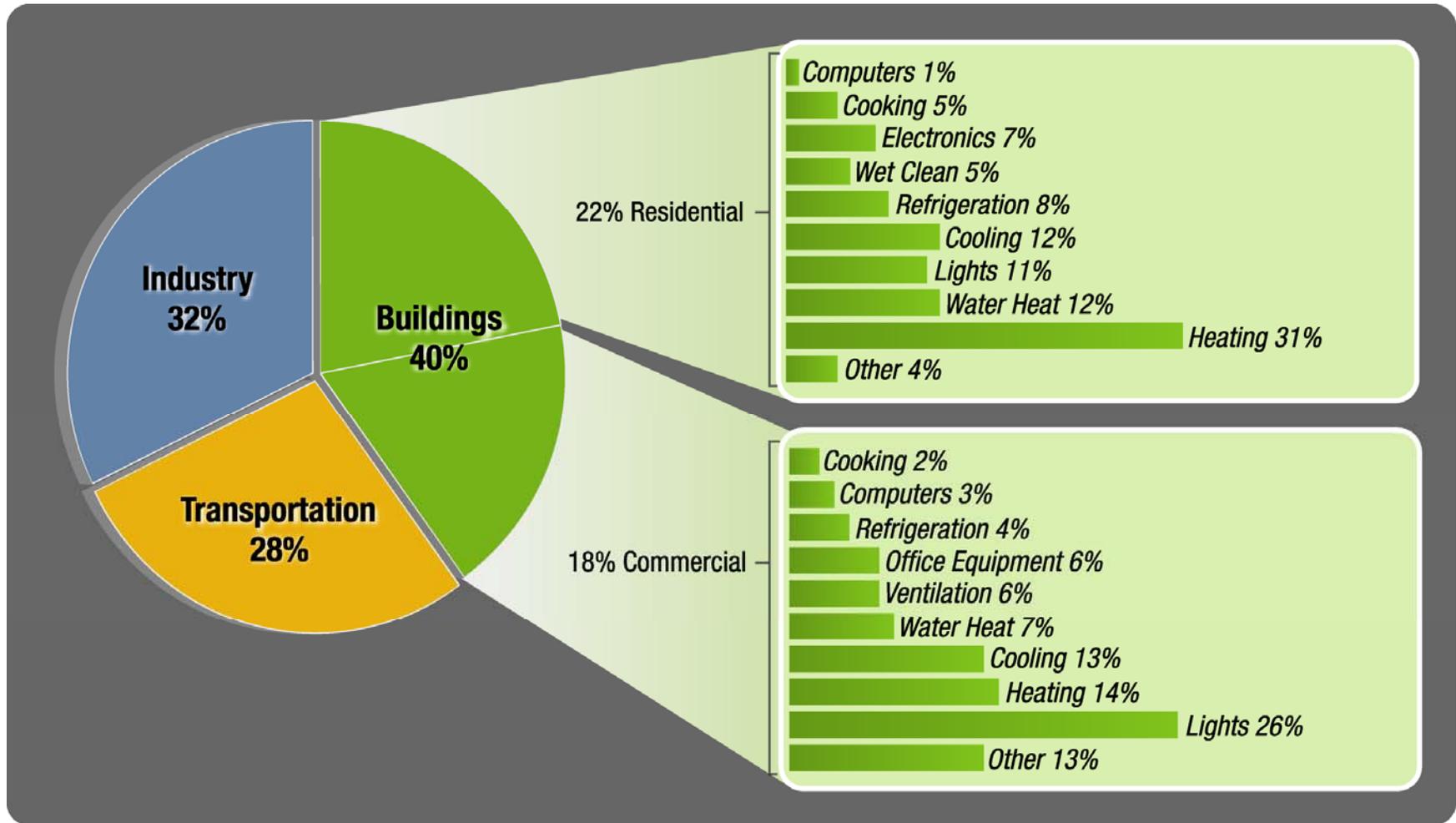


Figure prepared by National Renewable Energy Laboratory and the U.S. Department of Energy



An Emergent Organization

- 22 initial performers, now 25
 - Research universities
 - DOE laboratories
 - Industrial firms
 - Economic development agencies
 - Community and technical colleges
- Not a closed consortium
- Dynamic association
- Driven by performance
- An emergent organization
- A ***deployment*** focus, not a lab

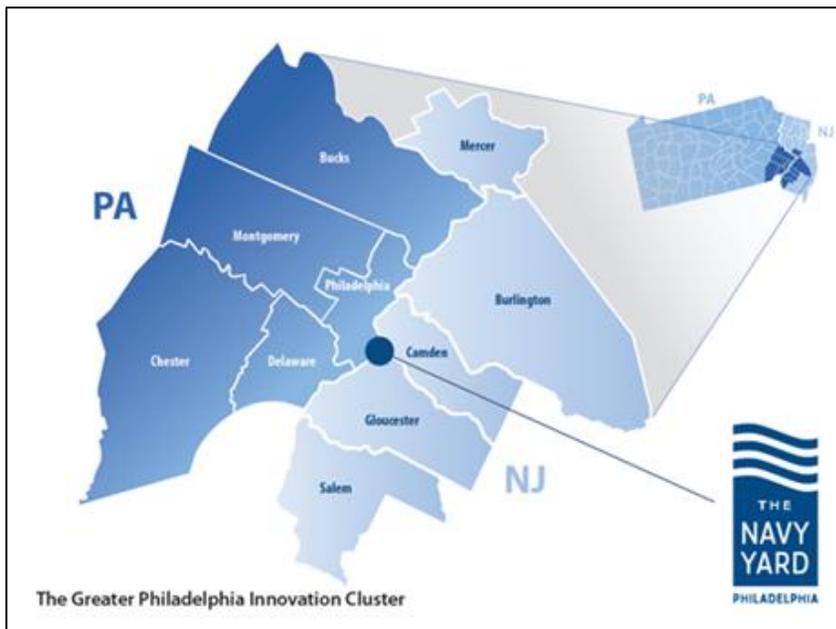
EEB Hub Performers:

The Pennsylvania State University
Bayer MaterialScience
Ben Franklin Technology Partners of SE PA
Carnegie Mellon University
Collegiate Consortium
Delaware Valley Industrial Resource Center
Drexel University
IBM Corporation
Lawrence Livermore National Laboratory
Lutron Electronics, Inc.
Morgan State University
New Jersey Institute of Technology
Philadelphia Industrial Development Corporation
PPG Industries
Princeton University
Purdue University
Rutgers University
United Technologies Corporation
University of Pennsylvania
University of Pittsburgh
Virginia Tech
Wharton Small Business Development Center

Energy- Regional Innovation Cluster (E-RIC)

Dual E-RIC Mission

Reduced energy use in buildings
Regional economic development



- Department of Energy
 - \$122 million
- Economic Development Administration
 - \$5 million
- National Institute of Standards and Technology
 - \$1.5 million
- Small Business Administration
 - \$1.3 million
- Commonwealth of Pennsylvania
 - \$30 million

Knowledge Cluster and Public-Private Partnerships Foster Regional Economic Development

- The **total market for energy efficiency in buildings** will reach **\$103.5 billion by 2017**, an increase of more than 50% from the 2011 market value of \$67.9 billion (Pike Research)
 - Over 7,000 buildings in Greater Philadelphia are retrofit ready*
- EEB Hub anchors an emerging innovation sector that can **attract companies** and **create both manufacturing and export opportunities**
 - Mark Group, Pace Controls, Oxicool, Viridity Energy*
- **Our challenge and opportunity:** *leverage the Hub for attracting additional innovation and industry cluster growth*

Goal, Vision, and Mission



OVERALL GOAL:

Reduce annual energy use in the regional commercial buildings sector by 20 percent by 2020.

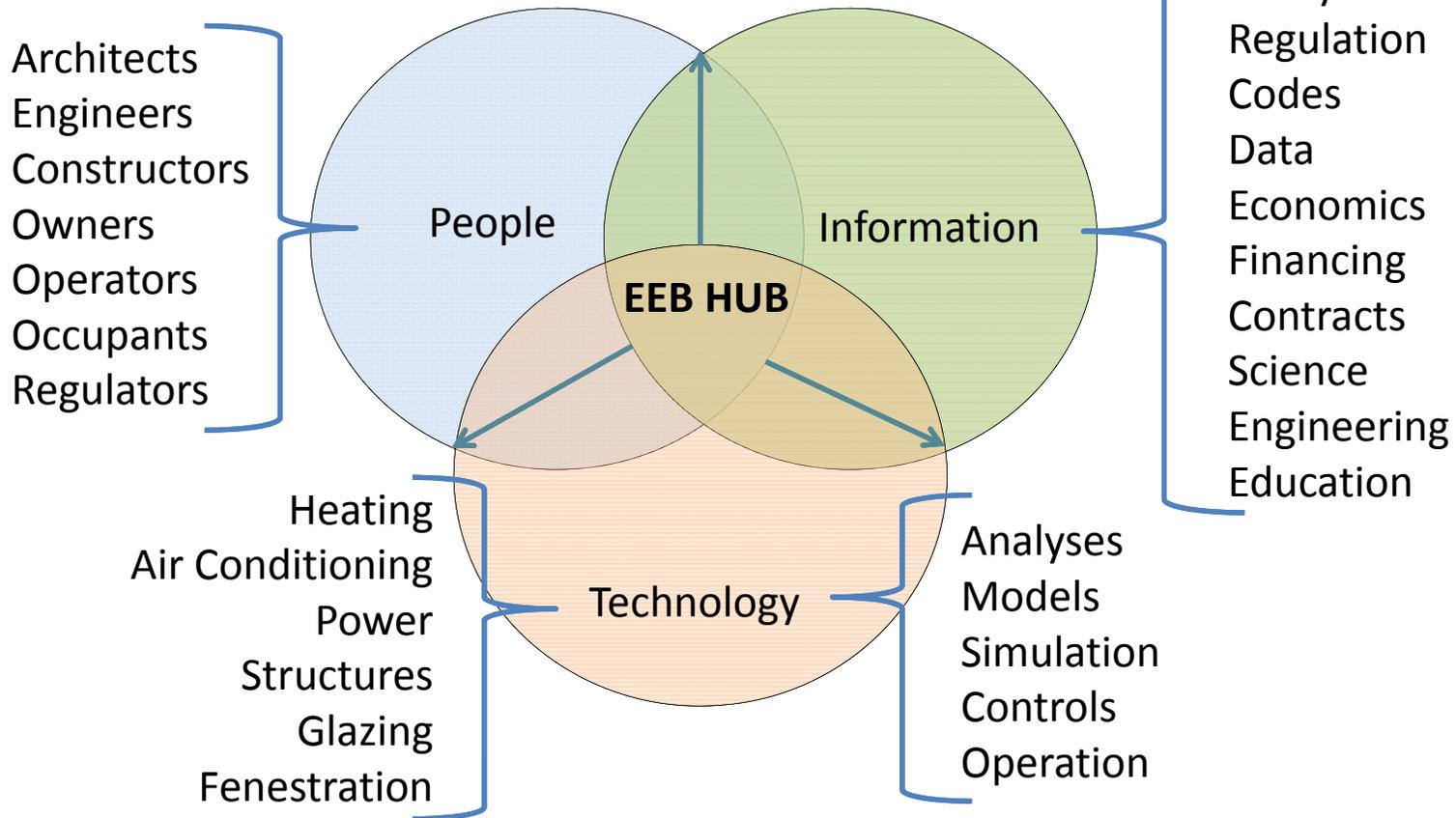
VISION:

Design, demonstrate and deploy market proven solutions in the Greater Philadelphia region so that the buildings sector accomplishes its full potential for ongoing energy efficiency.

MISSION:

Accomplish the goal through informed people, validated information, and proven technologies.

The Challenge: Adoption



EEB Hub Objectives

1. Develop and deploy to the building industry a **state-of-the-art modeling platform to integrate design, construction, commissioning, and operation**
2. Demonstrate the **market viability of integrating energy saving technologies for whole building solutions** at the Navy Yard and elsewhere in the region.
3. **Identify policies that accelerate market adoption of energy efficient retrofits** of commercial buildings and support policy makers in the development of such policies in the Greater Philadelphia region.
4. **Inform, train, and educate people** who design, own, construct, maintain, or occupy buildings about proven energy saving strategies and technologies
5. **Help launch ventures with new and existing companies** that will exploit market opportunities for providing whole building energy saving solutions.

Entrepreneurial Ecosystem at The Navy Yard

Partners:

- Satellite Quorum
- Hub Commercialization Center
- Wharton SBDC
- DVIRC

Assets:

- 270 buildings
- Test bed for research and demonstration
- Smart Grid/Building to Grid Integration
- Clean Energy Campus/Corporate growth



Building 661 Retrofit Project



EAST FACADE



S.W. CORNER



GYM INTERIOR



ROOF & PARKING LOT



Advanced Energy Retrofit
Living EEB Laboratory
Permanent EEB Hub HQ

Thank You

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