Be an Energy Hero
How?

With Green Construction, Healthy Homes, Net Zero,
Building Performance, Weatherization and More!
Weatherization/Home Performance
Energy Use in the U.S.

Buildings use about 40% of all energy in the United States
Residential Buildings

- Over 120 million residences in the U.S.
- About 90% of homes we’ll have in 2030 are already built!
Weatherization/Home Performance

What is it?

- Improve existing buildings for efficiency, comfort, and health
- Generally achieves about 20% savings
  - Deep energy retrofits would target 50% or more savings
Weatherization/Home Performance

- Major measures
  - Air sealing
  - Insulation
  - Efficient heating and cooling
  - Duct leakage can also be major
Other common measures?

- Water heater replacement
- Faucet aerators
- Replace old refrigerators
- New windows and doors (often not cost-effective)
- Efficient lighting (LEDs)

- No cost behavior changes (do not leave the refrigerator door open and dust the coils)
Customer Benefits of Building Performance

- Reduced utility bills
- Improved comfort
- Less pollution & safety problems
- Good investment - Many measures pay for themselves multiple times over their lifetime
Career Pathways

- Building/Home Performance Contractor
- HVAC Contractor with heat pump design experience
- Energy Efficiency Program Director
- Residential Building Code Official (with green building experience)
- Multifamily Quality Control Inspector
- Quality Control Inspector
- Multifamily Energy Auditor
- Healthy Home Evaluator
- Building Performance Crew Leader
- Residential Energy Auditor
- Energy Efficiency Sales Representative
- Energy Efficiency Technician (residential)
- Energy Efficiency Program Assistant
- Building Performance Installer
COOL TOOLS™ used in building performance

- Blower Door
- Infrared Camera
- Smoke Pens
- Borescope
- Combustion Analyzer
- Gas Leak Detector
- IAQ Monitors
- Energy Monitors
- Smart Home Tech
Green Construction

- Also known as green, sustainable, or high-performance building
- Creating better structures
- Less polluting, healthier and more efficient
Standards

LEED (1993)

WELL (2013)

RESET (2013)

FITWEL (2016)
Green Construction Fundamental Principles

• Use less materials

• Choose materials with less health and pollution impacts

• Design buildings run efficiently

• Build resilient structures that can adapt and will survive
Typical elements

- Single header leaving room for insulation.
- Insulated 3-stud corner or 2-stud corner with blocking.
- Inline or stacked framing when single top plates are used.
- Single top plate when studs and joists are aligned.
- 2x6 wood studs spaced 24” on center (versus 2x4 studs at 16” o.c.).
- Walls continuously sheathed with plywood or OSB.
- Jack studs and cripples at openings only where needed.
Green Construction Careers

• Sales
• Consultants
• Developers
• Design
  • Architects
  • Engineers
  • Urban Planners
• Construction
  • Construction Management
  • Tradespeople
Healthy Homes
Reduce Healthcare Costs and Housing Hazards

• $1.4 billion cost for preventable hospitalizations for asthma in 2004.

• Injuries occurring at home result in 4 million ER visits and 70,000 hospital admissions.

• Preventing lead poisoning among children saves $110 to $319 billion dollars annually.

One study found that the per visit cost for patients with asthma who were admitted to the hospital was nearly $6,000.
Outgassing/chemicals

- Many building materials and furnishings have chemicals that can outgas unhealthy chemicals
Outgassing/chemicals

- Some manufacturers have tried to reduce use of these chemicals
- There are **several labels and certification programs**
IAQ Monitors

- Small monitors for personal home measurements
- PM$_{2.5}$, VOCs, CO$_2$, temperature, radon, moisture
Net Zero Homes
Department of Energy: What is a Zero Energy Building?

- A 2:03 minute video
Careers for those interested in Zero Energy Buildings

Energy Raters / Building Science*
- Energy and Sustainability Analyst HERS Rater (PHIUS+ Rater)
- HERS Rater ation Specialist
- Construction nd Green Building Specialist*
- Building Scientist
- Building Decarbonization specialist

Construction*
- Construction Project Manager
- Project Manager, new construction
- General Contractor
- Project Developer

HVAC*
- Residential HVAC Design / Energy Modeling Specialist
- HVAC Installer / Technician
- HVAC Company owner
Careers for those Interested in Zero Energy Buildings

Energy Raters / Building Science
- Engineering
- Engineer
- Architectural Engineer
- Project Manager/Senior Mechanical/HVAC Engineer
- Senior Consultant/Engineer
- Energy Engineer

Project Management
- Assistant Project Manager
- Project Manager
- Senior Project Manager
- Project Developer

Architecture
- Project Architect
- Architect
- Intermediate Architectural Designer
- Design Program Manager

Energy Programs
- Energy Program Managers
- Building Energy Manager
- Commissioning / Energy Engineer

Higher Education
- Post Doc with advanced education
- Assistant Professor of Architecture
Positions with Green Building Leaders and Certifying Organizations

- Passive House and Jobs at Phius
  - PH Intern, Phius Certification Team Member, Phius Quality Assurance Associate, PH Coordinator, PH Consultant

- U.S. Green Building Council Jobs:
  - Internships
  - Arc Client Solutions Director
  - Associate, Market Transformation & Development (Mountain Region)
  - Business Systems Analysts
  - Compliance & Benefits Manager
  - Contracts Manager
  - Energy Programs Manager
  - GBCI Certification Reviewer
  - Global Market Development Associate
  - Green Building Coordinator / Green Building Specialist
  - LEED Certification Reviewers
  - LEED Specialist, Energy Engineer / LEED Specialist, Water
  - Manager, Business Intelligence
  - Quality Director, LEED Certification
  - Regional Coordinator, Market Transformation & Development (Mid-Atlantic and New England Region)
Types of Passive Buildings

- Single Family Homes
- Traditional and Modern architecture to fit a range of community visual aesthetics.
- Both new construction and retrofit of existing buildings.
Types of Passive Buildings

- Multi-family Buildings
- Office Complexes
- Skyscrapers
Passive House Principles
Use these ideas in your life plus consider these careers too
Be an Energy Hero

With Green Construction, Healthy Homes, Net Zero, and High Performance Buildings!

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