

CABEC

Spring 2008

Where the Savings Are



Rebates and Incentives

Utility programs

Tax Credits

Residential and Commercial

Manufacturer Rebates

—REAL INCENTIVES—

Efficiency and Construction Quality

http://dsireusa.org

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http://www.dsireusa.org/ energy rebate

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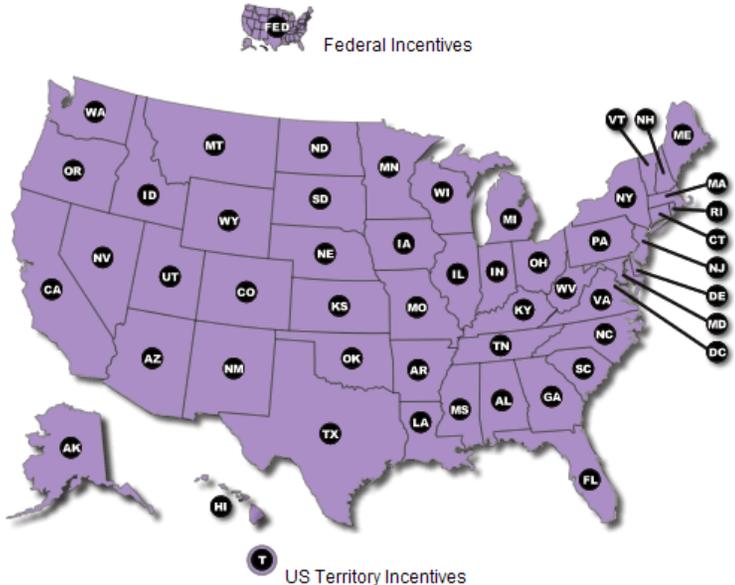
NC Solar Center IREC Contacts About Us NCSU



DSIRE is a comprehensive source of information on state, local, utility, and federal incentives that promote renewable energy and energy efficiency. Choose one or both databases to search:

Renewable Energy Energy Efficiency

FED Federal Incentives



US Territory Incentives

FAQs
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Summary Tables
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New / Updated Incentives

Last Updated: 05/27/08

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California Incentives for Renewables and Efficiency

[See Federal Incentives](#)

[See All Summaries](#)

[See Homeowner Incentive Summaries Only](#)

Financial Incentives

Green Building Incentive

- [Costa Mesa - Fee Waiver and Expedited Permitting for Green Building](#)
- [Marin County - Marin's BEST! Energy Incentive Program](#)
- [San Diego County - Green Building Program](#)
- [Santa Monica - Building Permit Fee Waiver for Solar Projects](#)
- [Santa Monica - Expedited Permitting for Green Buildings](#)

Leasing/Lease Purchase

- [Santa Clara Water & Sewer - Solar Water Heating Program](#)

Local Grant Program

- [Santa Monica - Green Building Grant Program](#)

Local Loan Program

- [Santa Monica - Solar Santa Monica](#)

Personal Deduction

- [Tax Deduction for Interest on Loans for Energy Efficiency](#)

Production Incentive

Incentives

[Incentives List](#)

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Production Incentive

- [California Feed-In Tariff](#)
- [City of Palo Alto Utilities - Solar Renewable Energy Credit Purchase Program](#)
- [SCE - Biomass Standard Contract](#)

Property Tax Exemption

- [Property Tax Exemption for Solar Systems](#)

State Loan Program

- [Agriculture and Food Processing Energy Loans](#)
- [Energy Efficiency Financing Program](#)

State Rebate Program

- [California Solar Initiative - Photovoltaics Incentives](#)
- [California Solar Initiative - Pilot Solar Water Heating Program](#)
- [CEC - New Solar Homes Partnership](#)
- [Emerging Renewables Program](#)
- [Self-Generation Incentive Program](#)

Utility Grant Program

- [Alameda Power & Telecom - Key Account Energy Efficiency Grant Program](#)
- [Alameda Power & Telecom - Weatherization Cash Grant Energy Efficiency Program](#)
- [Anaheim Public Utilities - Residential Energy Efficiency Grant Program](#)
- [Burbank Water & Power - Business Bucks Energy Efficiency Grant Program](#)
- [LADWP - Small Business Direct Install Lighting Program](#)
- [Riverside Public Utilities - Energy Efficiency Technology Grant Program](#)

Utility Loan Program

- [Alameda Power & Telecom - Commercial Energy Efficiency Loan Program](#)
- [IID Energy - Residential Energy Efficiency Loan Program](#)
- [Pacific Power - Energy FinAnswer](#)
- [Roseville Electric - Residential HVAC Financing Program](#)
- [SDG&E - Non-Residential On-Bill Financing Program](#)

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- [SDG&E - Non-Residential On-Bill Financing Program](#)
- [SMUD - Commercial Energy Efficiency Loan Program](#)
- [SMUD - Residential Energy Efficiency Loan Program](#)
- [SMUD - Residential Solar Loan Program](#)
- [SoCalGas - Non-Residential On-Bill Financing Program](#)

Utility Rebate Program

- [Alameda Power & Telecom - Commercial Energy Efficiency Rebate Program](#)
- [Alameda Power & Telecom - Solar Photovoltaics Rebates Program](#)
- [Anaheim Public Utilities - Commercial Energy Efficiency Rebate Program](#)
- [Anaheim Public Utilities - Green Building Rebate Program](#)
- [Anaheim Public Utilities - Greener Cleaners Energy Efficiency Incentive Program](#)
- [Anaheim Public Utilities - New Construction Energy Efficiency Incentives Program](#)
- [Anaheim Public Utilities - PV Buydown Program](#)
- [Anaheim Public Utilities - Residential Home Efficiency Rebate Program](#)
- [Anaheim Public Utilities - Small Business Energy Management Assistance Program](#)
- [Azusa Light & Water - Solar Partnership Program](#)
- [Banning Electric Department - Solar Support Program](#)
- [Burbank Water & Power - Business Energy Efficiency Rebate Program](#)
- [Burbank Water & Power - Green Building Incentive Program](#)
- [Burbank Water & Power - Residential & Commercial Solar Support Program](#)
- [Burbank Water & Power - Residential Energy Efficiency Rebate Program](#)
- [City of Healdsburg - PV Incentive Program](#)
- [City of Lompoc Utilities - Commercial Lighting Program](#)
- [City of Lompoc Utilities - PV Rebate Program](#)
- [City of Lompoc Utilities - Residential Energy Efficient Appliance Rebate Program](#)
- [City of Palo Alto Utilities - Commercial Advantage Energy Efficiency Program](#)
- [City of Palo Alto Utilities - PV Partners](#)
- [City of Palo Alto Utilities - Smart Energy Rebate Program](#)
- [City of Palo Alto Utilities - Solar Water Heating Program](#)
- [Colton Public Utilities - PV Rebate Program](#)

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- [Colton Public Utilities - PV Rebate Program](#)
- [Glendale Water and Power - Medium and Large Business Energy Efficiency Solutions Program](#)
- [Glendale Water and Power - Peak Hogs Energy Efficiency Rebate Program](#)
- [Glendale Water and Power - Residential Energy Efficiency Rebate Program](#)
- [Glendale Water and Power - Small Business Energy Efficiency Rebate Program](#)
- [Glendale Water and Power - Solar Solutions Program](#)
- [Hercules Municipal Utility - PV Rebate Program](#)
- [Hercules Municipal Utility - Residential Energy Efficiency Rebate Program](#)
- [IID Energy - PV Solutions Rebate Program](#)
- [IID Energy - Residential Energy Efficiency Rebate Program](#)
- [LADWP - Non-Residential Custom Performance Program](#)
- [LADWP - Residential Energy Efficiency Rebate Program](#)
- [LADWP - Solar Incentive Program](#)
- [Lassen Municipal Utility District - Residential Energy Efficiency Rebate Program](#)
- [Lodi Electric Utility - PV Rebate Program](#)
- [Lodi Electric Utility - Residential Energy Efficiency Rebate Program](#)
- [Merced Irrigation District - PV Buydown Program](#)
- [Modesto Irrigation District - Commercial Power Saver Rebate Program](#)
- [Modesto Irrigation District - Custom Commercial Power Saver Rebate Program](#)
- [Modesto Irrigation District - Photovoltaic Rebate Program](#)
- [Modesto Irrigation District - Residential Power Saver Plus Rebate Program](#)
- [Pacific Power - Irrigation Initiative](#)
- [Pasadena Water and Power - Residential Energy Efficiency Rebate Program](#)
- [Pasadena Water and Power - Solar Power Installation Rebate](#)
- [PG&E - Non-Residential Energy Efficiency Rebates](#)
- [PG&E - Residential Energy Efficiency Rebate Programs](#)
- [PG&E - Residential New Construction Program](#)
- [Plumas-Sierra REC - PV Rebate Program](#)
- [Plumas-Sierra REC - Residential Energy Efficiency Rebate Program](#)
- [Redding Electric - Earth Advantage Rebate Program](#)
- [Redding Electric - Residential and Commercial Energy Efficiency Rebate Program](#)

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- [Riverside Public Utilities - Commercial Energy Efficiency Rebate Program](#)
- [Riverside Public Utilities - Energy Efficiency Construction Incentive](#)
- [Riverside Public Utilities - Non-Residential PV Incentive Program](#)
- [Riverside Public Utilities - Residential Energy Efficiency Rebate Program](#)
- [Riverside Public Utilities - Residential PV Incentive Program](#)
- [Roseville Electric - Commercial Energy Efficiency Rebate Program](#)
- [Roseville Electric - New Commercial Construction Energy Efficiency Rebate Program](#)
- [Roseville Electric - PV Buy Down Program](#)
- [Roseville Electric - Residential Energy Efficiency Rebate Program](#)
- [Roseville Electric - Residential New Construction Rebate Program](#)
- [Savings by Design \(Offered by five Utilities\)](#)
- [SCE - Agricultural Efficiency Plus Program](#)
- [SCE - Non-Residential Efficiency Programs](#)
- [SCE - Residential Energy Efficiency Programs](#)
- [SDG&E - Business Energy Efficiency Rebate Programs](#)
- [SDG&E - Residential Energy Efficiency Rebate Programs](#)
- [SDG&E - Residential New Construction Energy Efficiency Incentive Program](#)
- [Sierra Pacific Power - SureBet Program](#)
- [Silicon Valley Power - Commercial Energy Efficiency Rebate Program](#)
- [Silicon Valley Power - Residential Energy Efficiency Rebate Program](#)
- [Silicon Valley Power - Solar Electric Buy Down Program](#)
- [SMUD - Commercial Energy Efficiency Rebate Program](#)
- [SMUD - Non-Residential PV Buydown](#)
- [SMUD - PV Residential Retrofit Buy-Down](#)
- [SMUD - Solar Water Heater Rebate Program](#)
- [SoCalGas - Multi-Family Residential Rebate Program](#)
- [SoCalGas - Non-Residential Energy Efficiency Rebate Programs](#)
- [SoCalGas - Residential Energy Efficiency Rebate Programs](#)
- [SoCalGas - Residential New Construction Energy Efficiency Incentive Program](#)
- [Truckee Donner Public Utility District - Residential Energy Efficiency Rebate Program](#)

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- [Truckee Donner Public Utility District - Residential Energy Efficiency Rebate Program](#)
- [Truckee Donner PUD - Photovoltaic Buy Down Program](#)
- [Turlock Irrigation District - PV Rebate](#)
- [Turlock Irrigation District - Residential Energy Efficiency Rebate Program](#)
- [Ukiah Utilities - PV Buy-down Program](#)

Alternative Fuel and Vehicle Incentives

- [U.S. Department of Energy's Alternative Fuels Data Center](#) **EXIT DSIRE**

Rules, Regulations & Policies

Appliance/Equipment Efficiency Standards

- [Appliance Efficiency Regulations](#)

Building Energy Code

- [Berkeley - Energy Conservation Ordinance](#)
- [California State Energy Code](#)
- [Marin County - Single Family Dwelling Energy Efficiency Ordinance](#)

Contractor Licensing

- [Solar Contractor Licensing](#)

Energy Standards for Public Buildings

- [Berkeley - Green Building Standards for City Owned and Operated Projects](#)
- [Green Building Action Plan for State Facilities](#)
- [San Diego - Sustainable Building Policy](#)
- [San Jose - Green Building Program](#)

Generation Disclosure

- [Power Source Disclosure Program](#)

Green Power Purchasing/Aggregation

- [Davis - Green Power Purchasing](#)

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Green Power Purchasing/Aggregation

- [Davis - Green Power Purchasing](#)
- [San Diego - Green Power Purchasing](#)
- [San Francisco - Renewable Energy Purchasing](#)
- [Santa Monica - Green Power Purchasing](#)

Interconnection

- [Interconnection Standards](#)

Net Metering Rules

- [California - Net Metering](#)

Public Benefits Fund

- [Public Benefits Funds for Renewables & Efficiency](#)

Renewables Portfolio Standard

- [Renewables Portfolio Standard](#)

Solar Access Law/Guideline

- [Los Angeles - Zoning Code](#)
- [Marin County - Solar Access Code](#)
- [Sacramento - Zoning and Subdivision Regulations](#)
- [San Diego County - Solar Access Regulations](#)
- [San Jose - Solar Access Design Guidelines](#)
- [Santa Cruz - Solar Access Ordinance](#)
- [Santa Cruz County - Solar Access Protection](#)
- [Sebastopol - Solar Access](#)
- [Solar Easement and the Solar Shade Control Act](#)
- [Solar Rights Act](#)

Solar/Wind Permitting Standards

- [Oakland - Self Certification for Renewables](#)
- [San Jose - Solar Hot Water Heaters & Photovoltaic Systems Permit Requirements](#)

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http://kdfc.com/pages/743368.php

- [Oakland - Self Certification for Renewables](#)
- [San Jose - Solar Hot Water Heaters & Photovoltaic Systems Permit Requirements](#)

Alternative Fuel and Vehicle Policies

- [U.S. Department of Energy's Alternative Fuels Data Center](#) **EXIT DSIRE**

Related Programs & Initiatives

- **Green Power Network: Buying Green Power in Your State** **EXIT DSIRE**
The U.S. Department of Energy's Green Power Network provides news and information on green power markets and related activities. This site provides state-by-state information on [Green Power Marketing in Competitive Electricity Markets](#) and [Utility Green Pricing Programs](#).

In addition, the site lists marketers of [Renewable Energy Certificates](#) (RECs) (also known as green tags or tradable renewable certificates), which represent the environmental attributes of the power produced from a renewable energy project. Whether or not consumers have access to green power through their local utility or a competitive electricity marketer, consumers can purchase RECs without having to switch electricity suppliers.

- **Wind Powering America** **EXIT DSIRE**
The U.S. Department of Energy's Wind Powering America site provides [state-by-state wind project information](#), including validated wind maps, anemometer loan programs, small wind guides, legislative briefings, wind working groups, and state-specific news.

 **DSIRE**
Database of State Incentives for Renewables & Efficiency

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History of Building

- Light Materials and Drafty
- Massive Walls and Structures and Drafty
- Lighter Materials and Drafty
- Lighter Materials and Tighter
- Add Glass
- Add Heating
- Add Cooling
- Add Insulation
- Add Ventilation



Homes were often Sited

- As people became aware of an areas local wind patterns, they incorporated this knowledge into design.

Northeast—'Saltbox' Style

- Classic design, short north facing wall with two story south facing entry.
- Cold 'nor'easters' blew onto minimal wall area.
- Two floors of South facing wall for winter maximum heat gain.
- Shade trees provide for summer relief.

Southeast—Charleston

Antebellum Style with a Piazza

- A piazza is a covered open porch or veranda supported by columns or pillars and attached to the outside of a building. In Charleston the piazza was an outdoor living space and generally shaded the south or west-facing windows from the heat of the sun.

Southeast—Charleston Antebellum Style with a Piazza



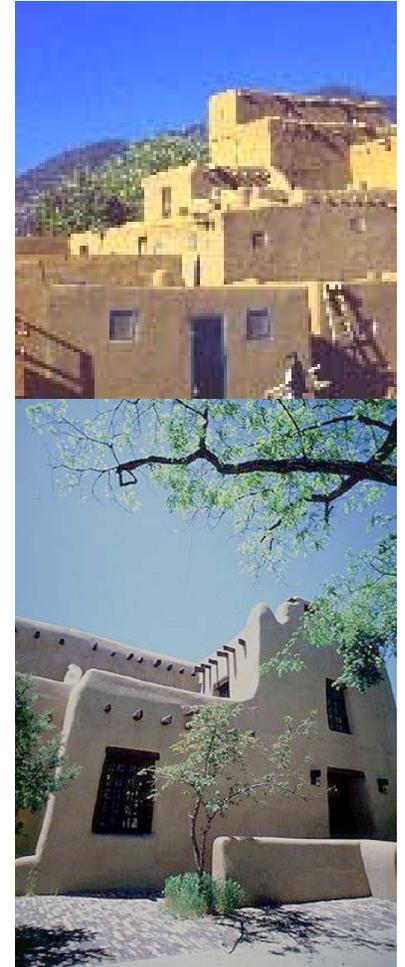
South—Dogtrot

- In the South, people sought relief from the summer heat on the open breezeways of their 'dogtrot' homes.
- It is a means of natural ventilation and light.



Southwest—Adobe

- “The descendants of the Mexican settlers of the San Luis Valley of Colorado tell us that when their ancestors wondered how thick to make the walls of their adobe homes in their new environ they turned the local ground squirrels. They measured the depth of the burros of and built to those specifications.



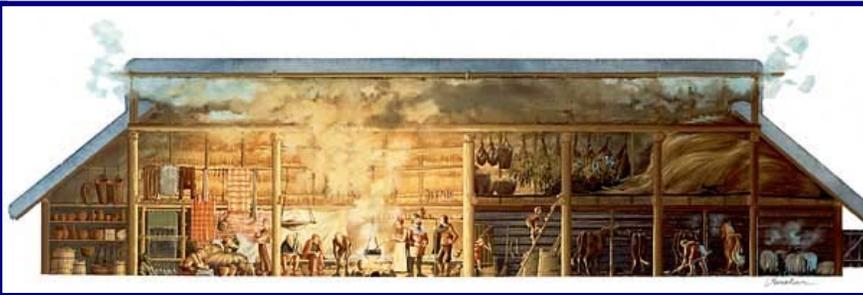
Natural Ventilation and Insulation

- Almost no homes enjoyed the benefits of insulation. Homes either had mass, stone walls, sod or logs, were timber framed with possibly some straw or mud in the voids.
- For many glass was an expensive luxury. Well into the 19th century glass was expensive and many homes had double shutters.
- Homes were naturally ventilated. Summer and Winter



Heating

- Homes for millennia had heating that was provided by a fireplace.
- In fact the English word for window does not come from a hole in a wall but a hole in the roof that the Vikings used to allow the smoke out of a building.
- Origin:
1175–1225; Middle English *windoge*, *windowe*
Old Norse *vindauga*, equiv. to *vindr* = *wind* +



Cooling

- Cooling typically was shade trees and siting the home to take advantage of cooling summer trade winds.
- Then came the advent of 'Air Conditioning' in the 20th Century.
- Homes became 'environments' within the much larger environment.



'Environment' within an Environment

- Today our homes are really 'environments' within the environment.
- Our inside environment is usually very different from the exterior environment which cause heat, air pressure and moisture flows to become increasingly more dynamic.

Building Performance Issues

- High energy bills
- High/Low interior humidity
- Uneven temperatures
- Warm/cool rooms
- Drafts
- Mold
- Wet crawlspaces
- Warped roof sheathing
- Window condensation
- Siding failures
- Stucco failures
- Insects
- Backdrafting of combustion equipment
- Poor indoor Air quality

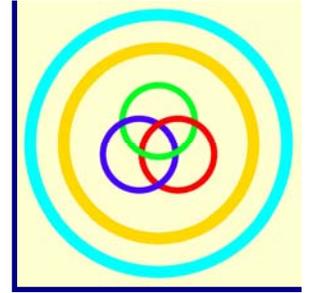
Synergy Homes

or “Whole House” Design/Build

- **syn·er·gy** *sĭn'ər-jē / - [sin-er-jee], n. pl.*
syn·er·gies
- The interaction of two or more agents or forces so that their combined effect is greater than the sum of their individual effects.

1660, "cooperation," from Mod.L. *synergia*, from Gk. *synergia* "joint work, assistance, help," from *syn-* "together" + *ergon* "work".

Building Synergy



- Building Envelope
 - Construction
 - Climate
 - Orientation
- Equipment and Systems
 - Indoor Climate
 - Appliances and Lighting
 - Ventilation
- Occupants
 - Habits/Customs
 - Age/Gender
 - Health
 - Environmental Preferences

Today!

- Buildings use 40% of the total U.S. Energy (including 2/3 of the electricity) and 16% of the total U.S. Water.
- “Each year in the U.S. about 13 billion worth of energy—in the form of heated or cooled air—or \$150 per household escapes through holes and cracks in residential buildings.”
 - —American Council for an Energy-Efficient Economy

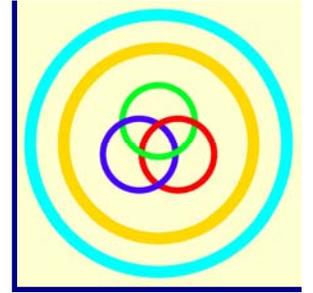
Then!

- “I considered fresh air as an enemy and closed with extreme care every crack and crevice in the room I inhabited.”
- “Experience has convinced me of my error. I am certain that no air is so unwholesome as air in a closed room that has been often breathed and not changed.”
 - —Benjamin Franklin

Today!

- “Most Americans spend about 90 percent of their time indoors, where pollutant levels may be 2-5 times higher, and occasionally 100 times higher, than outdoors.”
- —The Environmental Protection Agency (EPA)

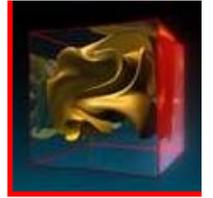
Building Synergy



- Buildings can be designed to be energy efficient, durable and sustainable—that's **SCIENCE**.
- The **ART** requires doing it in a manner that people can enjoy and that fits lifestyles, abilities and preferences.

Methods of Control

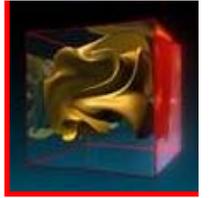
Convective Energy



- Air Barriers
- Insulation installed correctly
- Reduce thermal by-pass



Proper Alignment of Air and Thermal Barrier (CONTINUED)



- Art and science have their meeting point in method.
 - —Edward Bulwer-Lytton (1803 - 1873)
- Art is science made clear.
 - —Jean Cocteau (1889 - 1963)

What do Consumers Want?

- • 91% want energy efficiency
- • 61% want ENERGY STAR ratings
- • 80% say that current construction practices do not meet their interest in sustaining the environment
- • 96% are willing to pay more for “green” features
 - – 32% are willing to pay \$2,500 more
 - – 36% are willing to pay \$5,000 more
- • When asked to pick 3 out of 8 upgrades:
 - – 94% picked energy efficient features
 - – 59% picked improved indoor air quality features
 - – 40% picked kitchen cabinet upgrades
- Survey published in November 2001 issue of Professional Builder
 - www.housingzone.com



Other Programs

- **Alameda County Waste Management Authority & Alameda County Source Reduction and Recycling Board** www.stopwaste.org
- **RESNET** - www.natresnet.org
- **US Green Building Council – LEED for Homes** - www.usgbc.org/leed/homes
- **Building Performance Institute** - www.bpi.org
- **Energy and Environmental Building Association** - www.eeba.org
- **ENERGY STAR** – www.energystar.gov
- **Building Science Press** – www.buildingsciencepress.com

