ENERGY INSPECTORS®

COMPONENTS OF AN ENERGY EFFICIENT HOME

PRESENTED BY ENERGY INSPECTORS

ABOUT ENERGY INSPECTORS

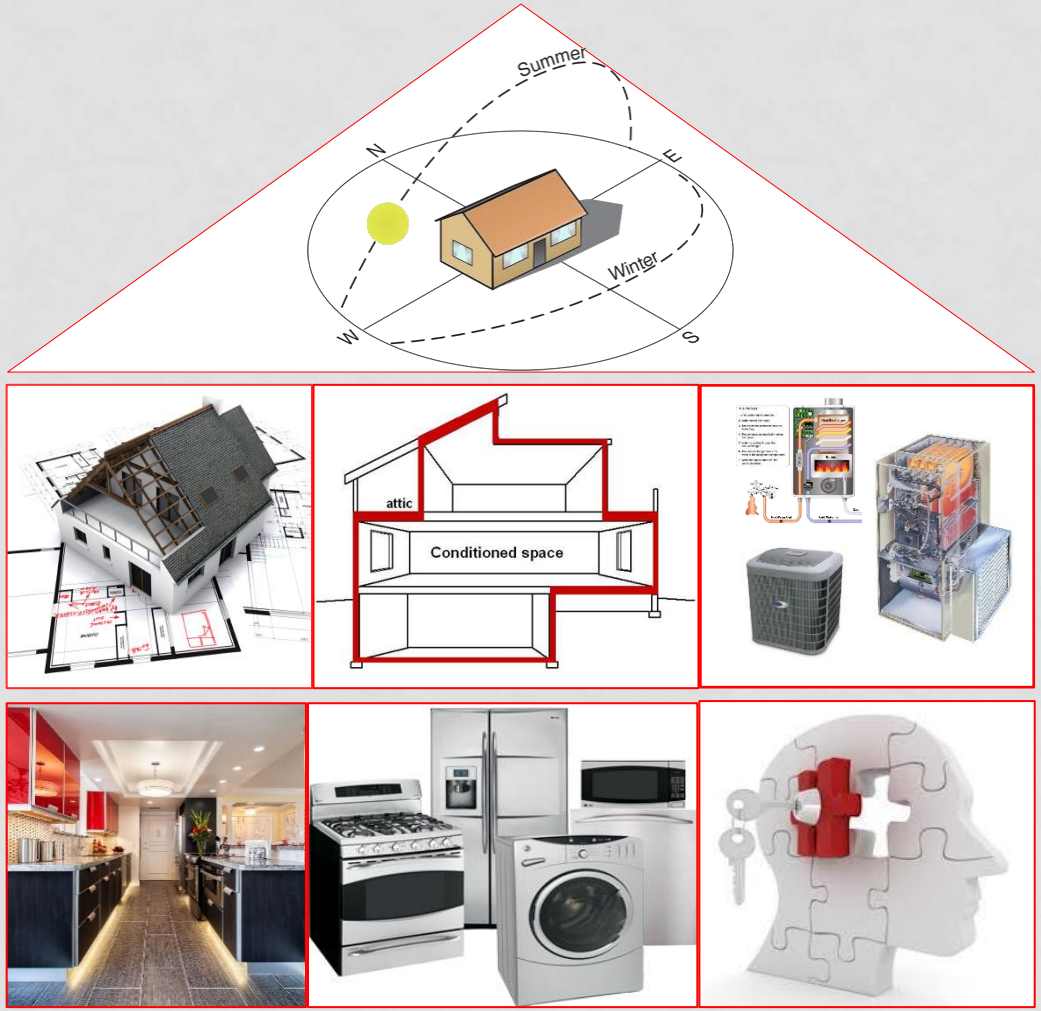
1. Founded in 1996
2. We provide comprehensive design, consulting and inspections services focused on energy efficiency and sustainability to the building industry
3. Operations in Arizona, California, Colorado, Nevada and Texas
4. 4th Largest LEED for Homes Provider in the nation
5. EPA ENERGY STAR Partner of the Year for the past 10 years

PURPOSE OF HOME

1. Safety
2. Comfort
3. Investment
4. Enable Experiences

ELEMENTS OF AN ENERGY EFFICIENT HOME

1. Building Orientation
2. Architectural Design
3. Building Envelope
4. Mechanical Systems
5. Lighting
6. Appliances
7. Behavioral



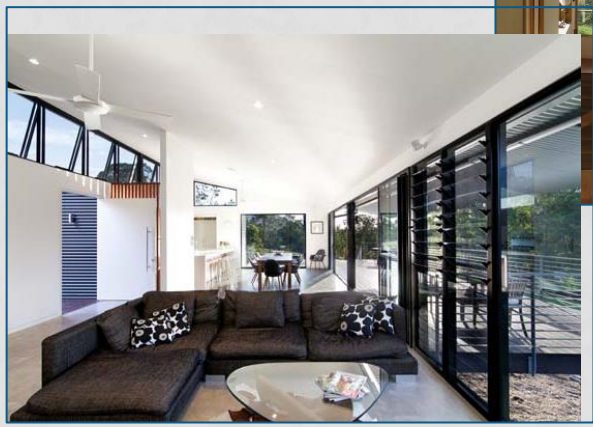
BUILDING ORIENTATION

Objectives:

1. Maximize annual energy yield of the PV Array

2. Maximize daylighting opportunities (windows along south walls)

3. Orient for cross ventilation



BUILDING DESIGN

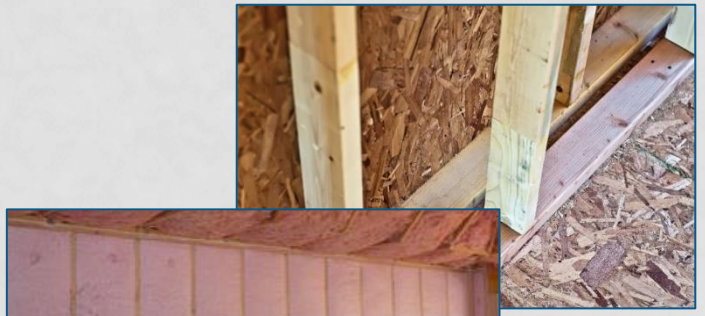
Objectives:

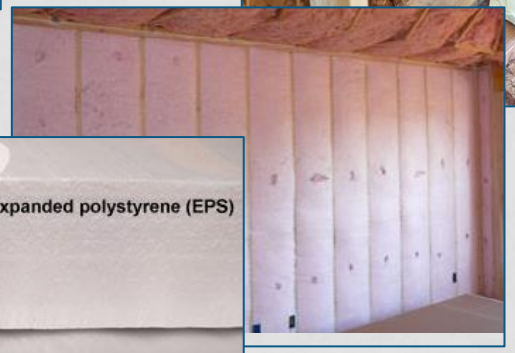
1. PV Friendly Roof design
2. Window Shading
3. Mechanical Systems Location
4. Open Floor Plans

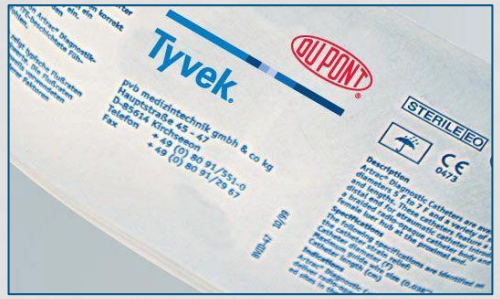
BUILDING ENVELOPE – WALL ASSEMBLIES

Objective:

1. Minimize Air Leakage
2. Control heat flow
3. Moisture Management







BUILDING ENVELOPE – HIGH PERFORMANCE WALLS

Wall Component	Scenario 1	Scenario 2
Framing Dimension	2X4	2X6
Framing Spacing	16”	16”
Cavity Insulation	R-15	R-19
Exterior Insulation	R-8	R-5

CEC Definition of High Performance Wall System: 0.051 U-factor

BUILDING ENVELOPE – HIGH PERFORMANCE ATTICS

Objective:

1. Control Heat Flow
2. Efficient Environment for Mechanical Equipment to Operate
3. Minimize Impact on Indoor Air Quality

UNVENTED ATTIC

VENTED ATTIC – CONDITIONED PLENUM SPACE

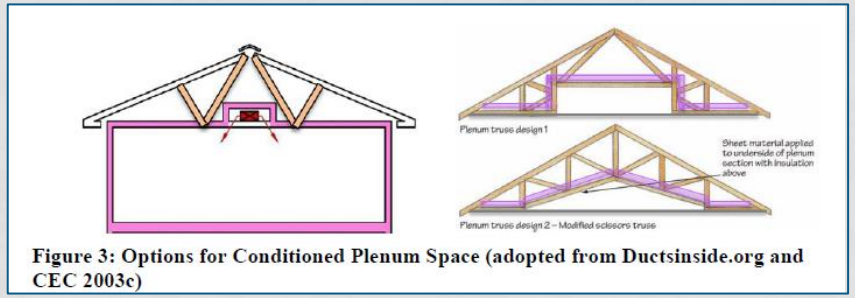


Figure 3: Options for Conditioned Plenum Space (adopted from Ductsinside.org and CEC 2003c)

MECHANICAL SYSTEMS – HEATING & AIR CONDITIONING

Objective:

1. Minimize Energy Consumption
2. Bring air distribution equipment into conditioned space
3. Personalize Comfort

Standard Split-System

Mini-Split

Variable Refrigerant Flow (VRF)

MECHANICAL SYSTEMS – VENTILATION

Objective:

1. Maintain positive indoor air quality
2. Minimize energy losses during ventilation
3. Minimize impact on occupants behavior

Ventilation Component	Strategy
ASHRAE 62.1	ERV/HRV
Bathroom/Laundry	Exhaust
Kitchen	Exhaust
Whole House	Climate Specific

MECHANICAL SYSTEMS – WATER HEATING SYSTEM

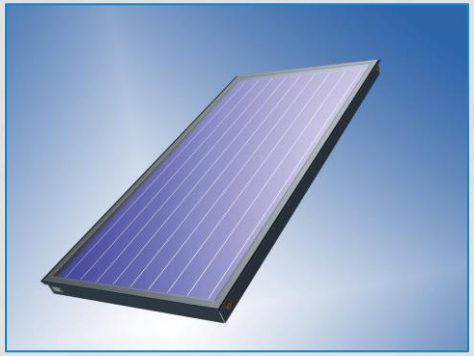
Objective:

1. Only Heat Water That Will be Utilized
2. Minimize Energy Consumption
3. Reduce Hot Water Delivery Time

Non-Condensing Tankless Water Heater

Condensing Tankless Water Heater

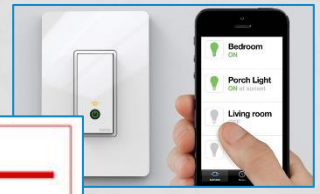
Solar Thermal

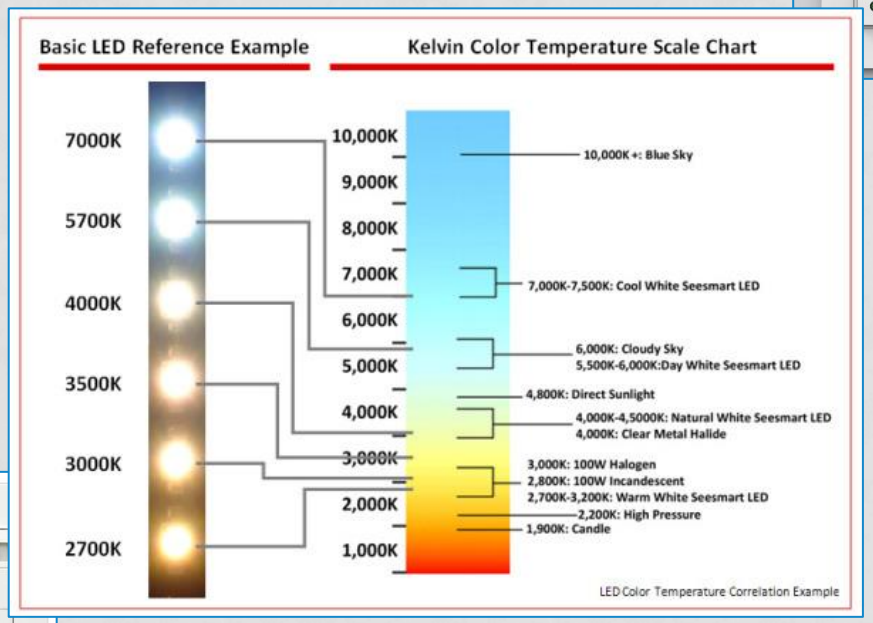


LIGHTING

Objective:

1. Reduce Energy Usage While Lighting Is In Use
2. Reduce Unnecessary Loads with Smart Controls
3. Match Lighting to Space Requirements
4. Utilize Daylighting





APPLIANCES

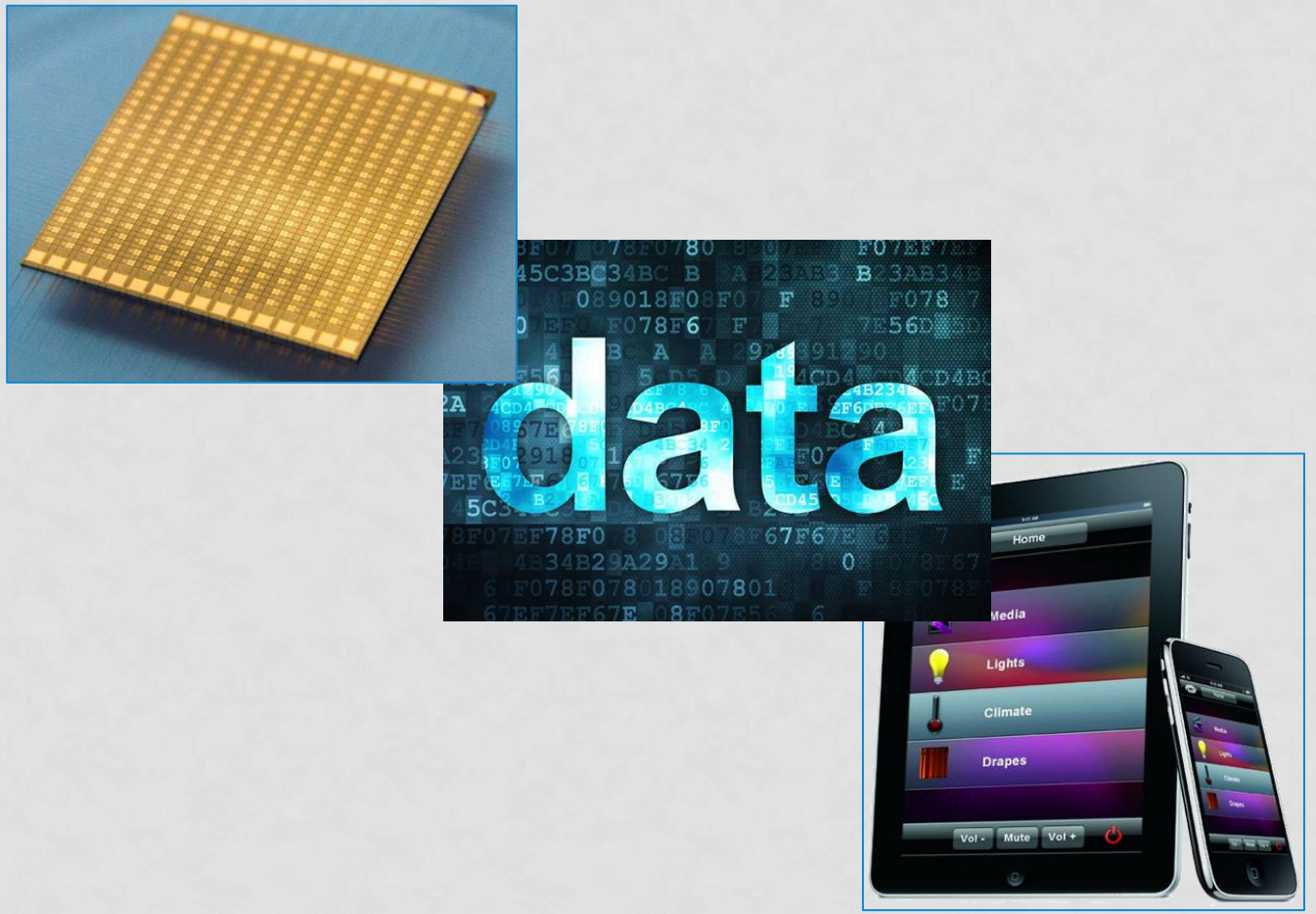
Objective:

1. Reduce Energy Usage Without Compromising Usefulness
2. Increase Energy Efficiency With Smart Controls
3. Go Beyond Energy

BEHAVIORAL

Objective:

1. Sensors
2. Data
3. Controls



CONSIDERATIONS FOR NEW PRODUCTS

- Is labor base trained to install product?
- Is there wide availability of the product, ideally from 2 or more sources?
- Does the product negatively impact the production schedule?
- If the product increases the cost of construction, can that cost be translated into increased appraisal value? If not, can it assist in closing home faster?