Introduction

The Builder's Field Guide presents approaches to energy efficient construction used throughout the Pacific Northwest. Builders can use the guide to meet standards of the Super Good Cents® energy efficient home program. But the construction techniques the guide describes can help improve the energy efficiency of any home.

Super Good Cents specifications are based on Model Conservation Standards developed by the Northwest Power Planning Council, a regional power planning body created by the 1980 Northwest Electric Power Planning and Conservation Act.

The Super Good Cents program is a voluntary approach to meeting Model Conservation Standards. Electric utilities in the Northwest encourage energy efficient new home construction because it is generally less expensive to conserve electrical energy than to build new power generating facilities. And it is less costly to install efficiency measures during home construction than it is to install equivalent measures into existing homes.

Throughout the Builder's Field Guide, you will find references to 1994 Long Term Super Good Cents (LTSGC) specifications***—1994 LTSGC 2.2.1,*** for example. Refer to these specifications, included as an Appendix to the Builder's Field Guide, for specific requirements. Utilities sometimes have additional requirements or tailor standards to meet local needs.

Program specifications change over time. Specifications in this publication went into effect in January 1994. Consult the participating Super Good Cents utility for the most current program information.

Homes built to 1994 Super Good Cents standards have significantly better energy performance than homes built to 1994 energy codes in all Northwest states. But in some cases, specific state or local code requirements exceed Super Good Cents specifications. **WHERE LOCAL CODE REQUIREMENTS EXCEED SUPER GOOD CENTS STANDARDS, LOCAL CODE REQUIREMENTS MUST BE MET.**

The Builder's Field Guide follows the construction sequence and explains the energy efficiency details that must be addressed at each stage to meet Super Good Cents performance standards. You can photocopy the appropriate chapter for each crew member or subcontractor so they have the energy efficient construction details they need. Or discuss the issues raised in each chapter as bids are developed and as work proceeds.

DECIDING TO BUILD AN ENERGY EFFICIENT HOME: A SIMPLE WAY OF EVALUATING INVESTMENTS IN ENERGY EFFICIENCY

In most cases, building homes to Super Good Cents standards costs more than meeting state energy code requirements. Is the additional cost worth it?

You can analyze the additional cost as an investment and compare the return on investing in energy conservation or renewable energy to other investments you could make.

A "Rate of Return" method allows you to compare energy savings investments to savings account interest, stocks, or mutual funds, for example. In its simplest form, the rate of return is the annual dollar savings divided by the capital cost.

Step One: Calculate Net Capital Cost

The net capital cost is the price minus anything that reduces the price, such as incentives, tax credits, deductions, and manufacturer rebates.

Example:

Suppose that proposed energy improvements to a home cost $1,100 and qualify for a $100 tax credit. The net capital cost would be $1,000.

Step Two: Calculate the Annual Savings

Use the best available information to calculate the average annual savings. In the case of house envelope measures, use a computer program that estimates energy use such as SUNDAY or WATTSUN to compute estimated annual energy use with and without energy improvements. Multiply the difference by the cost per energy unit to determine annual dollar savings.

Example:

WATTSUN tells you that the house with the improvements uses 3.0 kWh/ft^2/yr. The house without improvements uses 4.0 kWh/ft^2/yr. The house floor area is 2,000 ft^2.

3.0 kWh/ft^2/yr x 2,000 ft^2 = 6,000 kWh/yr

4.0 kWh/ft^2/yr x 2,000 ft^2 = 8,000 kWh/yr

The difference in energy use is 2,000 kWh/yr.

If electricity costs $0.05/kWh, the estimated annual savings is 2,000 kWh x $0.05/kWh = $100

Step Three: Calculate the Tax Free Income Advantage

Like other investments, savings from energy conservation and renewable energy puts dollars into your pocket, but you do not have to pay income tax on it! Estimate the tax you would pay on the savings if it were taxable. Add that figure to the savings for a fair comparison with return on taxable investments.

Example:

On $100 a person in the 28 percent tax bracket pays 0.28 x $100 = $28 in federal income tax. If the state charges income tax, estimate that also and add to the annual energy savings.

Step Four: Adjust for Inflation

With your conservation investment, you shield money from inflation as you would with any income-producing, long-term capital asset. Liquid assets, however, are subject to inflation. Add the avoided cost of inflation to your cash flow stream for a fair comparison. Multiply the net capital cost by the annual inflation rate. Add the avoided cost of inflation to the annual energy savings.

Example:

Inflation is 3.5 percent per year. $1,000 x 0.035 = $35/yr in avoided inflation cost.

Step Five: Add All the Positive Annual Cash Benefits

Example:

Energy savings	$100
Tax benefit	28
Avoided inflation	35
Total annual cash benefit	$163

Step Six: Divide Annual Cash Benefits by Net Capital Cost

Example:
$163/$1,000 =16.3%

Step Seven: Compare Pre-Tax Rates of Returns

Example:

Savings account	4.5%
Money market	4.9%
CDs	6.75%
Mutual fund	15%
Conservation investment	16.3%

As you can see, conservation investments can be good income producers and tax and inflation shelters. You can use the rate of return method to assess investments in envelope measures, heating system improvements, solar water heaters, exhaust air heat pumps, energy efficient lighting, and a host of other investments in energy conservation and renewable energy.