RESEARCH OPEN HOUSE

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CREATING A RETRO FIT PROGRAM

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Apply for eligibility or available for all

Reason for improvements?

Appliance failure, lack of comfort, utility bill increase, purchase of new home, incentives (rebates, lower utility bill, "free" fixtures, money

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Creating a retrofit program for your area can be a challenge and includes many steps, including researching the area. The research below has been gathered from other existing programs in different locations and will cover: what a typical audit would look like, how it is completed, and what oppositions there may be for upgrades. This process will help determine the best program for your region or area.

FLOW CHART

Based on the information gathered from above, a flow chart was constructed. First, we determine the criteria for who is eligible for the program or we make the program available everyone. There could be a special program for those of lowincome status. Then we determine the reason for the improvements, whether the customer requests them or whether the customers are polled for feedback. The reason for improvements can include appliance failure, lack of comfort, or having incentives. We begin the process of determining the type of funding for which the customer is eligible. Next, we begin the utility bill review and/or energy audit. From this step, we can determine what upgrade oppositions would be best for the project and the customers. Upgrades can include appliances, envelope, HVAC system, or a mixture of these. Once we identify which upgrades would be appropriate, we can begin a cost comparison for implrementing the upgrades (Figure 2). We can also determine possible payback periods and savings (Figure 4), and create different levels of upgrades with pricing options (Figure 3). After determining the upgrades that should be made, we begin exploring payment oppositions and determine how much of the cost will be out of pocket. Next we will be creating a bid with all the specifications and details included. During the construction phase work hand and hand with the contractors and the auditor. We must remember that each project is unique and that we may have to change the process slightly for different projects.

given for improvements), reduce energy burdens <u>Funding</u> Local, state, and/or federal financing, incentives (rebates, lower utility bill, "free" fixtures, money given for improvements) **Utility Bill Review Energy Audit** Year reviews of electrical, gas, oil Blower door test Can obtain from previous owner, renter, or the Energy use Carbon score utility company Measure what the building is using vs. industry What you should be at Payback period standards Determine what is the energy burned Climate data Evaluation of appliances, fixtures, HVAC system, or a combination of both attic insulation Upgrade options **HVAC** <u>Appliances</u> <u>Envelope</u> Upgrade to Energy Star, oil/ Windows, doors, insulation, Upgrade for efficiency, ALL switching to mini splits gas to electric exterior finishing • Cost comparison for making upgrades • Level of upgrades • Fixture oppositions vs. cost • Different packages • Estimate of savings and payback period • Industry comparison vs. energy being used • Design examples <u>Payment</u> • Incentives, financing, local help, federal help, state help, rebates Creating bid • List of specification of specific fixtures, sealants, materials, application • Cost estimate of work • Details of each room's improvements • Proof of insurance Plans Typical Construction Phase • Architect and engineers create a bid set (not limited to: site, design, structural, mechanical, electrical, plumbing). • Place for bidding based on the drawings. Construction Phase • Working with the owner, contractors, and auditor in • GC submits a quota and then all are reviewed.









making sure all are on the same page.

• If occupants are still there, can the move temporarily?

• Check-ins, evaluation, possible bower door test.

• Begin outside and work inward.



• Typical goes to the lowest bidder and is a lump sum and

• Framing (walls, roof, windows are all installed)

fixed price.

• Inspections:

End of audit analysis and test

• Construction begins.

Foundation

• HVAC, Plumbing, Electrical

• Final: everything is looked over

• Pre-pour