



HVAC / Energy Design - Residential

Professional builders and developers, our firm can increase the energy performance of designs you already use. We analyze each plan for its baseline performance, and then recommend detailed improvements. And, since we provide recommendations specific to your project's climate, you can rest assured that our guidance best fits your project.

Bring us your plans:

- In CAD format
- From any climate and any location
- With the specifications you currently use
- With any known habits of the homeowners
- With any special requests

Choose a target for the improved energy performance:

- 15% better than code? (Energy Star), 20% better? 40% better? 55% better?
- Most cost-effective improvements?
- Maximum improvements for an incremental budget amount?
- Zero Energy?

We provide you with the construction specifications to achieve your target:

- Building envelope specifications
- R-values for walls, roof, foundation
- U-values and SHGC for windows
- Mechanical recommendations
- Specs for heating and cooling system
- Specs for ventilation, hot water, appliances, and lighting
- Specs and sizing for renewable energy
- Forecast of utility bills for baseline and then with improvements
- See page 2 of this document for more details

- Options available, such as:
 - o Detailed HVAC sizing, layout, and design
 - o Detailed cost/benefit analysis with payback details
 - o Construction systems comparison and analysis
 - o Financial incentive research and paperwork templates
 - o Marketing PDFs to express the building improvements

Contact us about your house or residential building:

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Typical Report Results include the forecasted energy performance and recommendation attributes below; however, every report is somewhat different and based upon needs and professional discretion.

Energy Consumption and Production

- Heating consumption monthly/annually
- Cooling consumption monthly/annually
- Hot water consumption monthly/annually
- Appliances consumption monthly/annually
- Lighting consumption monthly/annually
- Appropriate units (kWh, Therms, Gallons, \$)
- Renewable energy production forecast
- Annual utility bill forecast
- Annual utility bill benefit for recommendations

Windows

- Panes
- Construction material
- Emittance value
- U value
- Solar Heat Gain Coefficient

Insulation

- R-Value of walls
- Type and thickness of wall insulation
- R-Value of roof
- Type and thickness of walls insulation
- U value of doors
- Door construction material
- R-value of foundation insulation

Hot Water

- System type & energy source
- Efficiency rating
- Gallons per day of usage

Lighting

- Type of lighting fixtures
- Type of recommended bulbs
- Passive lighting techniques

Appliances

- Electric dryer recommendation
- Washing machine recommendation
- Refrigerator recommendation
- Dishwasher recommendation
- Cooktop & Oven recommendation
- Plug Loads (small appliances)

HVAC System Performance

- Heating system type
- Heating system efficiency
- Cooling system type
- Cooling system efficiency
- Ventilation system type
- Ventilation system efficiency
- Infiltration rates

Thermostat

- Thermostat recommendations

Geothermal System Performance

- System type
- Heating efficiency
- Cooling efficiency

Photovoltaic Specifications

- Recommended modules
- Watts / panel
- Array size
- Panel efficiency
- Inverter efficiency
- Losses
- Overall system efficiency

Solar Thermal Specifications

- Collector type
- Collector surface area

Wind Turbine Specifications

- Input wind speed
- Watts
- Recommended turbine(s)

Anticipated Homeowner Habits

- Number of building inhabitants
- Building occupancy hours per day
- Loads of laundry (wash and dry)
- Loads of dishes
- Number of showers
- Winter temperature set points
- Summer temperature set points