Integrating Energy, Water, Comfort and Climate Issues in Residential Program Design

Nehemiah Stone

The Benningfield Group

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Energy Programs Focus on Energy

- Duh.
- But, saving energy, saves water
- Saving energy reduces GHG emissions
- Saving energy increases comfort
- Saving water saves energy
- GHG emissions lead to higher energy needs and less water availability

All of these have an economic value (except the “Duh.”)

Why Do We Care?

Program Design

- Program design is guided by
  - The interests of the funder
  - What matters to the potential participant?
  - What can you measure?
  - What isn't already being done?
- It is too often just a response to an RFP.
  …from a single funder with a single agenda.

How Could a Program Bridge Gas, Electricity & Water

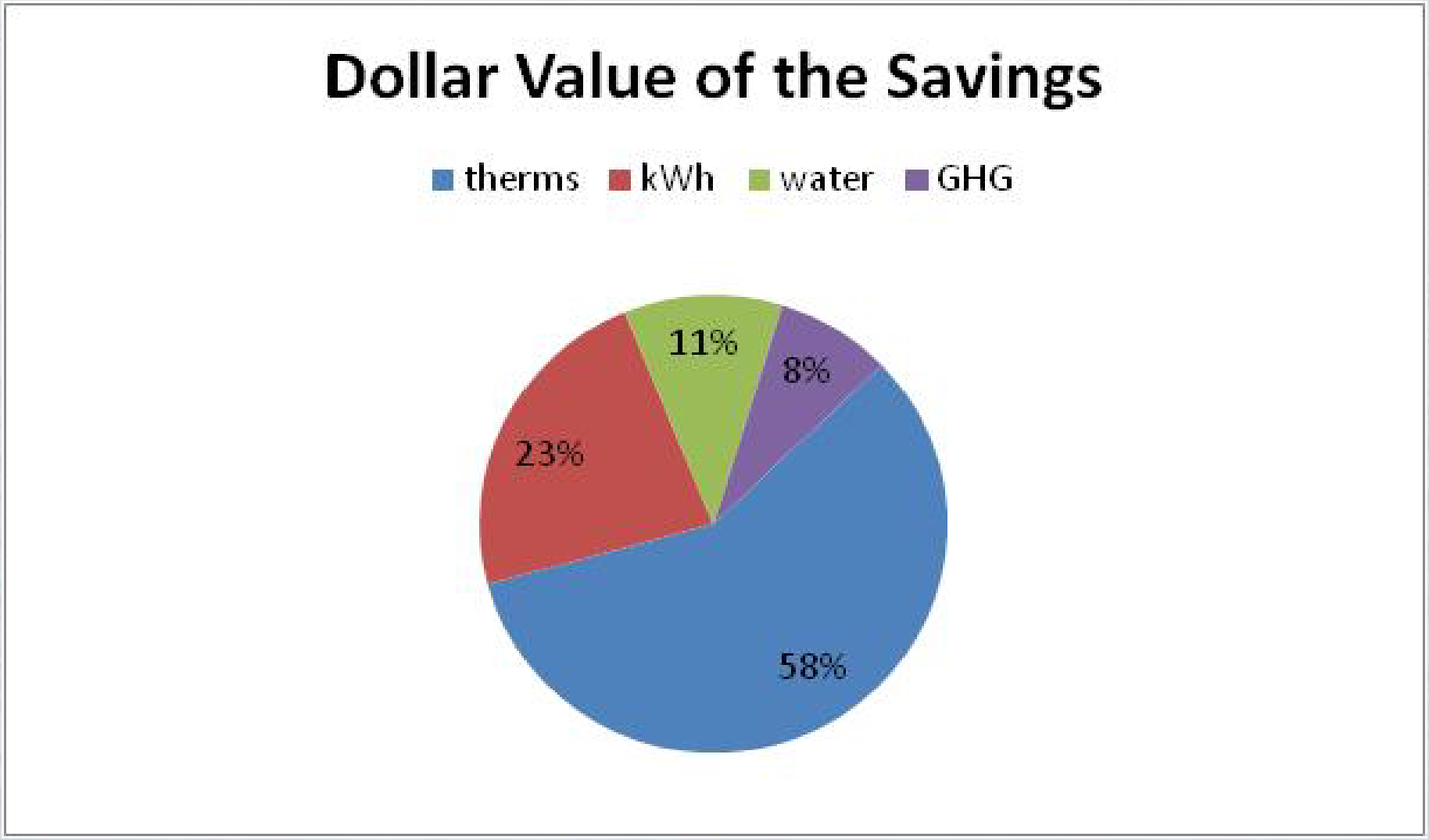
- Examples of potential integration:
  - DHW demand controls
  - Point-of-use water heating
  - Horizontal axis clothes washers
  - Smart controls on washers, driers, dish washers
- Full integration based on whole building
  - Benefits allotted relative to value
  - Some elements irrelevant to some funders

It’s a Lot to Do, but…

More Detailed Example

- Demand controls on central DHW system
  - The obvious funder is after the savings from the DHW heat source (usually gas in CA, often electricity in the NW)
  - Significant savings from short pump run times
  - Water savings from less “dumped” water while waiting for the hot
  - GHG quantification related to reductions in electricity, NG, and water

Why Should the NG Utility Pay for the Whole Thing?



Funders

- Gas utilities
- Electric utilities
- Water utilities
- State and local agencies
- Emissions trading board members (commodity traders)

Utility Program Metrics

- NPV of energy savings
- NPV of avoided demand
- GHA emissions reduction (sometimes)
- Missing?
  - Water value
  - Health costs
  - Productivity value

Comfort

- No funders for comfort?
  - Health care industry is the logical funder
  - Insurance industry (re: less legal risk)
  - State, based on value of increased productivity and impact on tax base
- Primarily, it is a marketing issue to building owners

What do we need?

- Energy Star
- Water Star (actually “Water Sense”)
- Comfort Star?
- Economic Star?
- Ringo Starr?
- Climate Star?
- LEED?

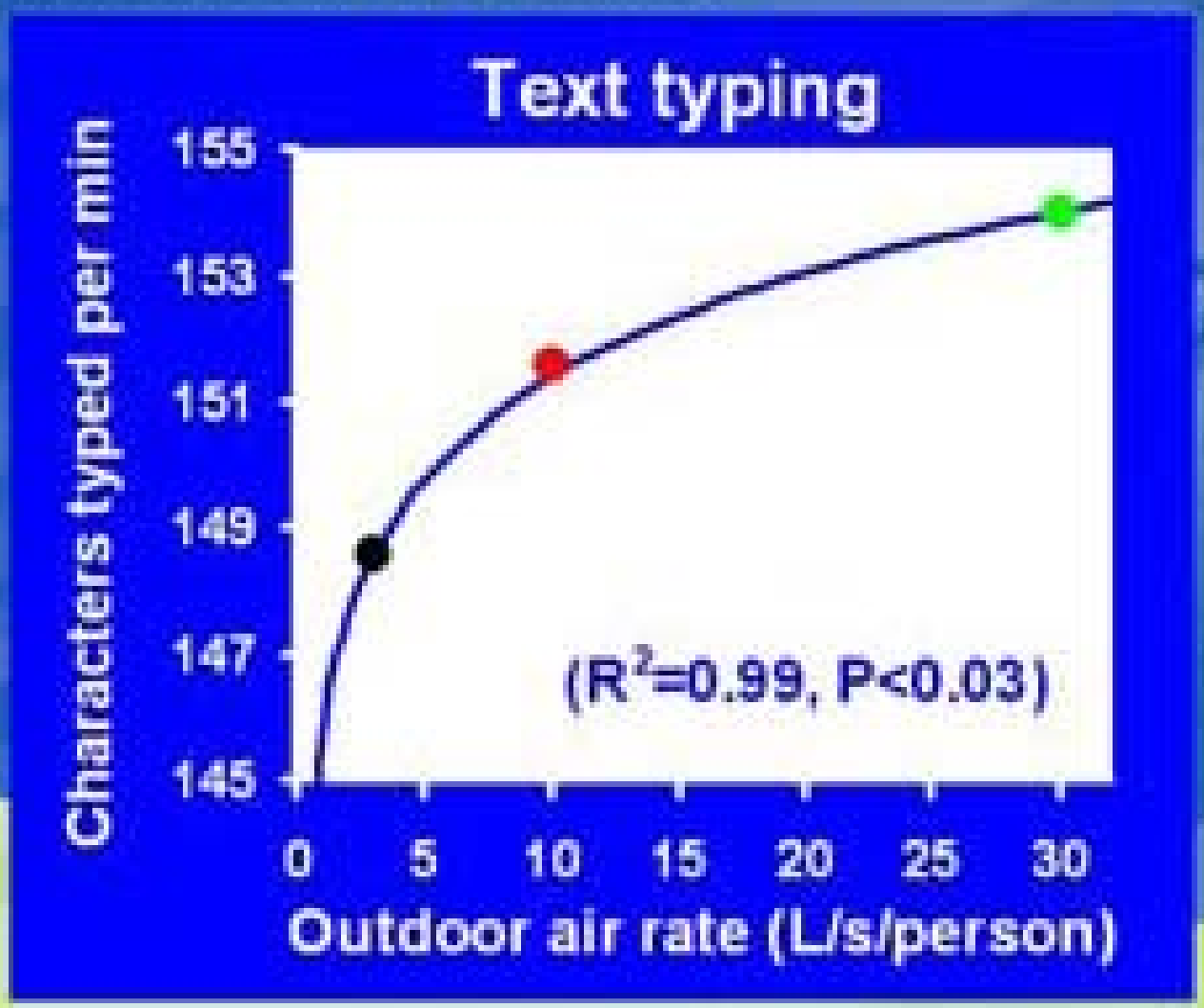
Studies on Residential Comfort

- Comfort is linked to health
  - LBNL Study
  - Danish Building Research Institute (Dept of Health and Comfort)
  - DOE
  - Long list of resources at <theenergyguy.com>
  - National Research Canada – Institute For Research in Construction

Economic Value of Health

- Building related illness costs $50 - $150B/yr in health care costs (LBNL web site, E. Mills)
- …another $43 - $235B/yr in lost productivity (The Costs and Financial Benefits of Green Buildings, G Katz. 2003)
- Lost productivity and extra health care costs reduce tenants' ability to cover rent
- When the South Coast Air Quality District first tried to quantify health value, they justified tens of millions of dollars of investments based on one aspirin/person affected by smog days in a year

Technical University of Denmark



Ola Wettergren, January 2008

What is Needed?

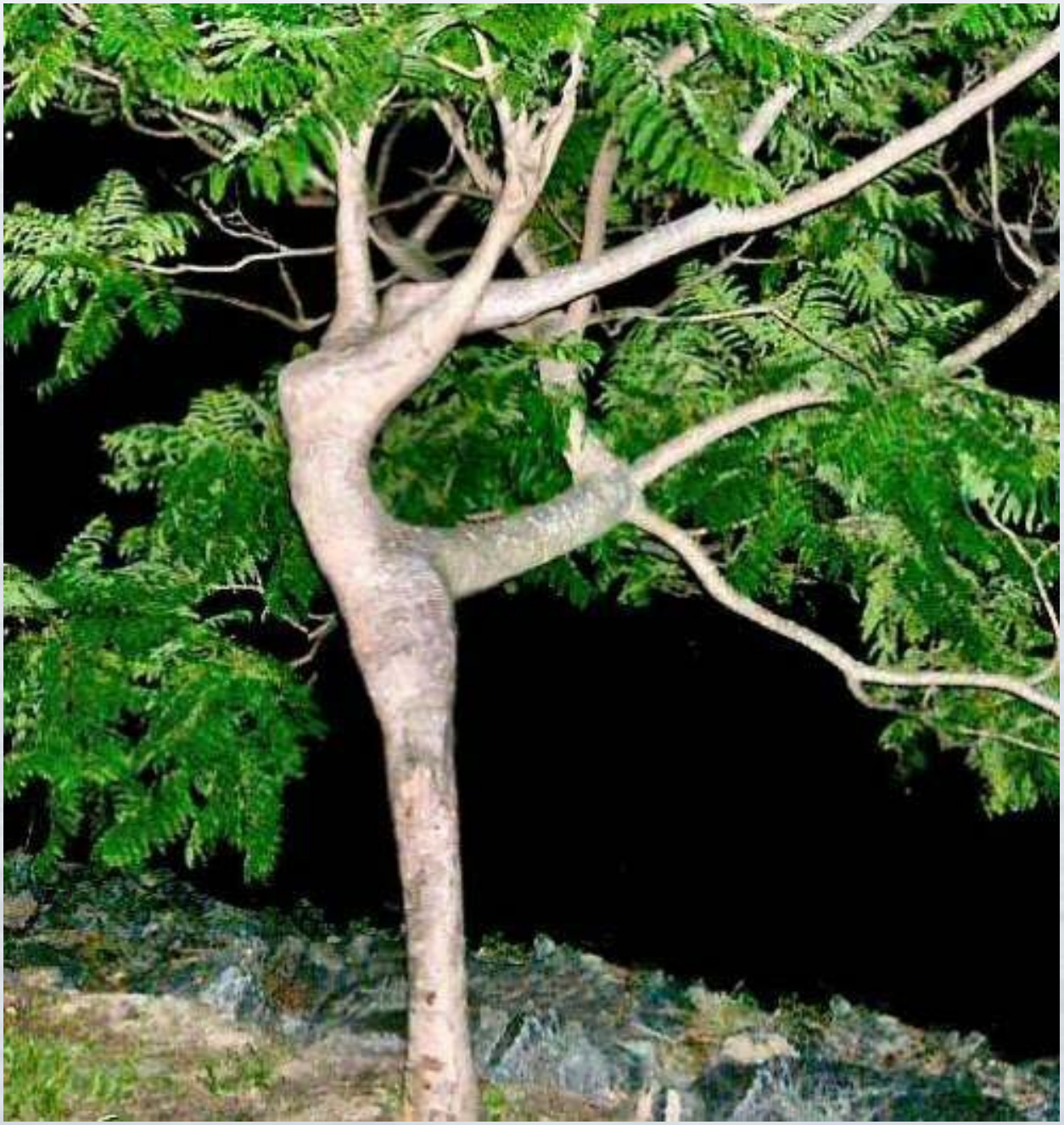
- Better metrics
  - Monitoring of all impacts (e.g., kWh, kW, therms, gallons, even sick days)
  - Better policy links; Oregon is a good example with
    - Energy Trust
    - Climate Trust
    - Water Trust

    …though even here, cooperation should be expanded

Participants

- Sell all the benefits – in terms they care about
  - E.g., don't mention "non-energy benefits"
  - Do talk about comfort
  - Talk about what costs them, and what the program will save them (e.g., insurance costs, vacancy rates)
- In today's "climate" it is also good to talk about positive environmental impacts

Even if we can't solve every-thing, perhaps we can bring **some** happiness!



Thanks

- Nehemiah Stone
- Benningfield Group
  nehemiah.stone@benningfieldgroup.com