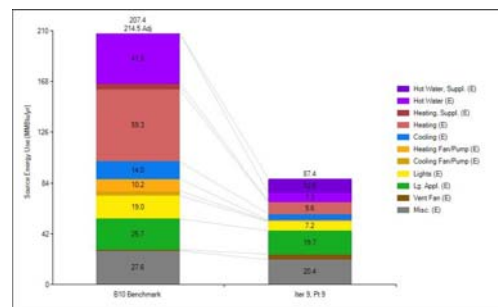




## Planning phase

- **Building passive:**
  - Use passive measures, to
  - Crush heating and cooling bills,
    - and the required capacities of the heating/cooling systems.
  
- **The classic kit of passive measures:**  
(mostly envelope)
  - Insulation: continuous and detailed thermal-bridge-free
  - High-performance windows
  - Air-sealing (& water vapor control)
  - Heat recovery ventilation (& sealed combustion)
  - Solar shading and passive solar



## Planning phase

Q: How much to invest in passive/envelope measures?

A: Economic feasibility or cost-competitiveness is a guiding principle.

Consider Designing to an energy performance standard.

One that limits heating and cooling loads, based on economics.

- A passive building standard, if you will.

## Planning phase



- PHIUS+ is such a passive building standard :D
- Heating and cooling load limits predicated on life-cycle cost optimization constrained
  - 2012 – added quality requirements.
  - 2015 – added climate-sensitivity.
  - 2018 – sensitivity to building size and occupant density.

