Our Networked Future

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Miscellaneous and Electronics

- These are **end uses** of energy
  - Electronics alone already > 11% of buildings elec.
- Significant savings possible through
  - changes in design,
  - changes in usage, and
  - both
- Naming challenging for these devices and modes
  - **Functions** key to making problem tractable

Orientation

- Two approaches to problem
  - present working forward
  - future working back
    (need both – key is balance)

- Actors – approach
  - Technology development — future
  - Utilities / retailers — present
  - Energy Star - both

Core methods to reduce energy use

- active

- low-power mode power

- idle time or power
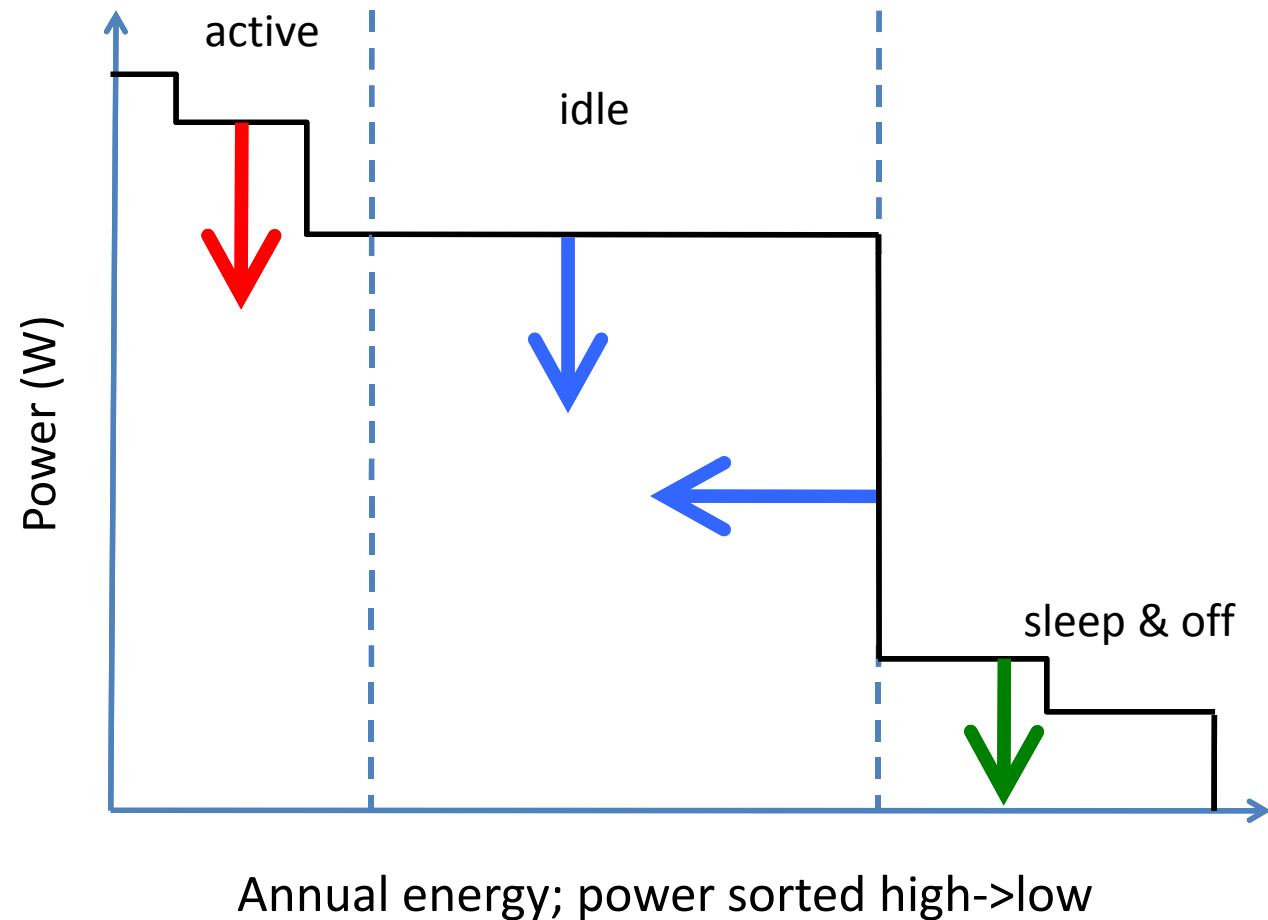
How to control Misc. energy ?

- Present
  - we don't know much about them
  - only way to control them is external
  - cutting power entirely OK

- Future
  - we know a lot about them
  - devices are mostly networked for functional purposes
  - devices can manage their own state
  - devices are networked: cutting power entirely NOT OK

Now, consider Electronics

- Many devices
- Multiple displays
- Many connections
- Audio, video separate
- Automatic functions
- Location independence

Other rooms

Internet

Service provider
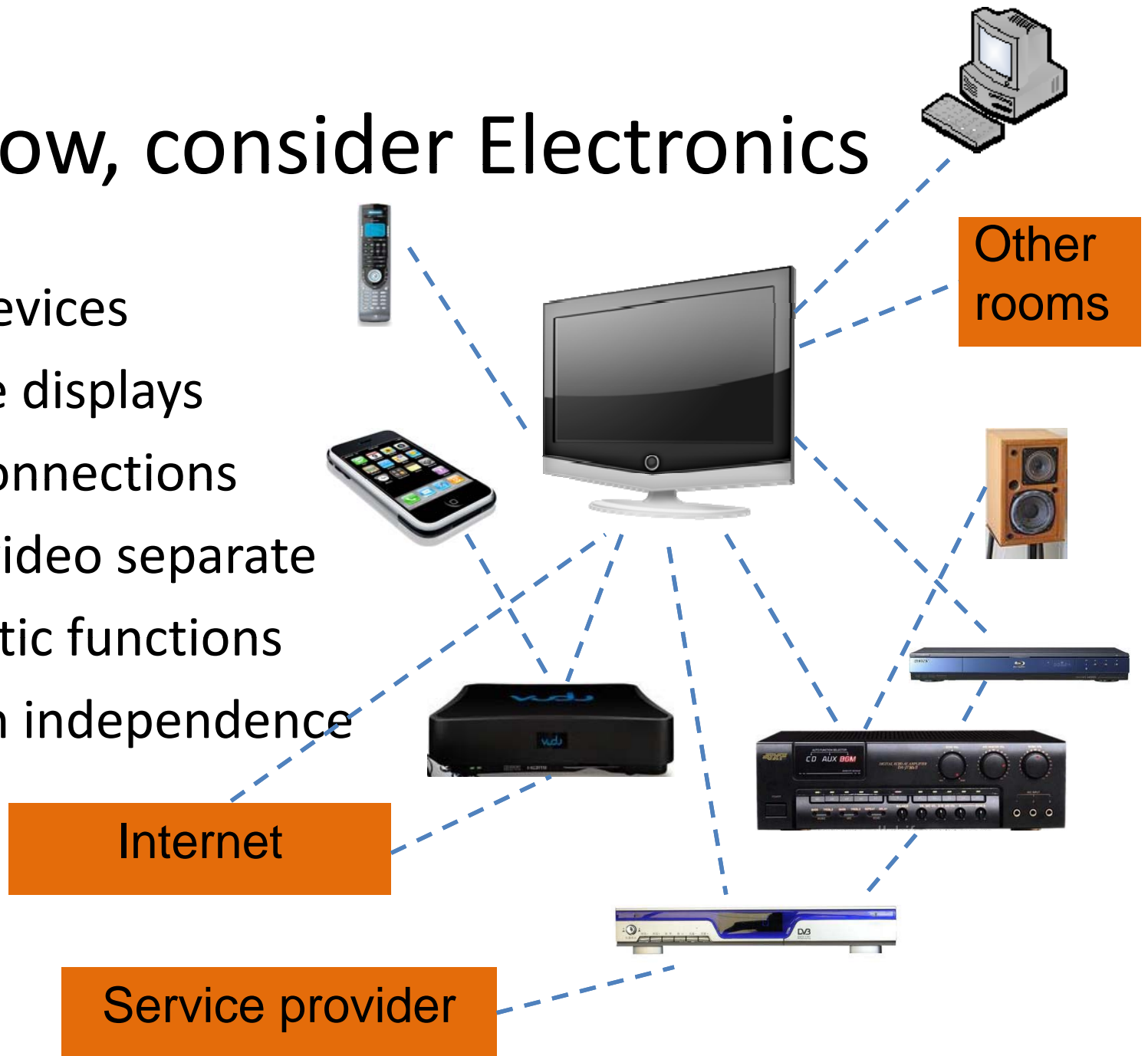
Electronics
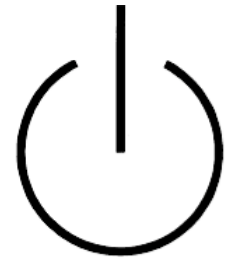
- Devices networked to share content
- May not be obvious (to user) what devices needed at any given time
- Manually powering up/down (even via remotes) only marginally successful
  - not a good use of people's time/attention
- Power control needs to be automatic
  - "**wake up when need to; go to sleep when can**"

Goal: deliver more energy savings AND
           more convenience

Building Networks

everything networked

communicate,

cooperate

When everything networked

Devices need to:

- … have low-power network connections and efficient sleep modes
- … be able to effectively respond to needs and preferences
- … share information, capabilities and displays
- … behave consistently, reasonably

Getting there

- Technology development roadmap
  - network standards (various layers)
  - user interface standards and conventions
    - (power control, display interaction, device behavior, lighting, climate, …)
- Design user expectations
- Global reach

Also: **iea-4e.org** – click on **News** – look for '**Standby**'

More future trends…

- devices reporting energy use over network
  - to building, utility (for rebates), or others

- remote user interfaces

- alternative power distribution
  - low-voltage dc, wireless, …
  - applies to all electricity, not just misc and electronics

- Nanogrids: very small power distribution systems
  - Single domain for voltage, reliability, administration
  - Gateways may be to AC grid or elsewhere
  - May enable functionalities not otherwise available
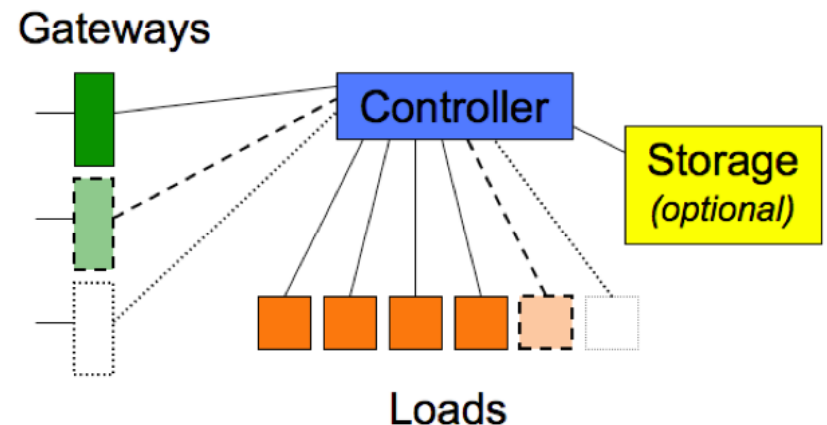
Summary - Orientation

- Need to consider future technology / strategy

  - danger of embedding unhelpful ideas in behavior

- Technology can do a lot for us
  - but not immediately, and not inevitable

- Energy Star can play a leading role in getting us to a better future

Thank you