

Realize the Potential of Connected Products

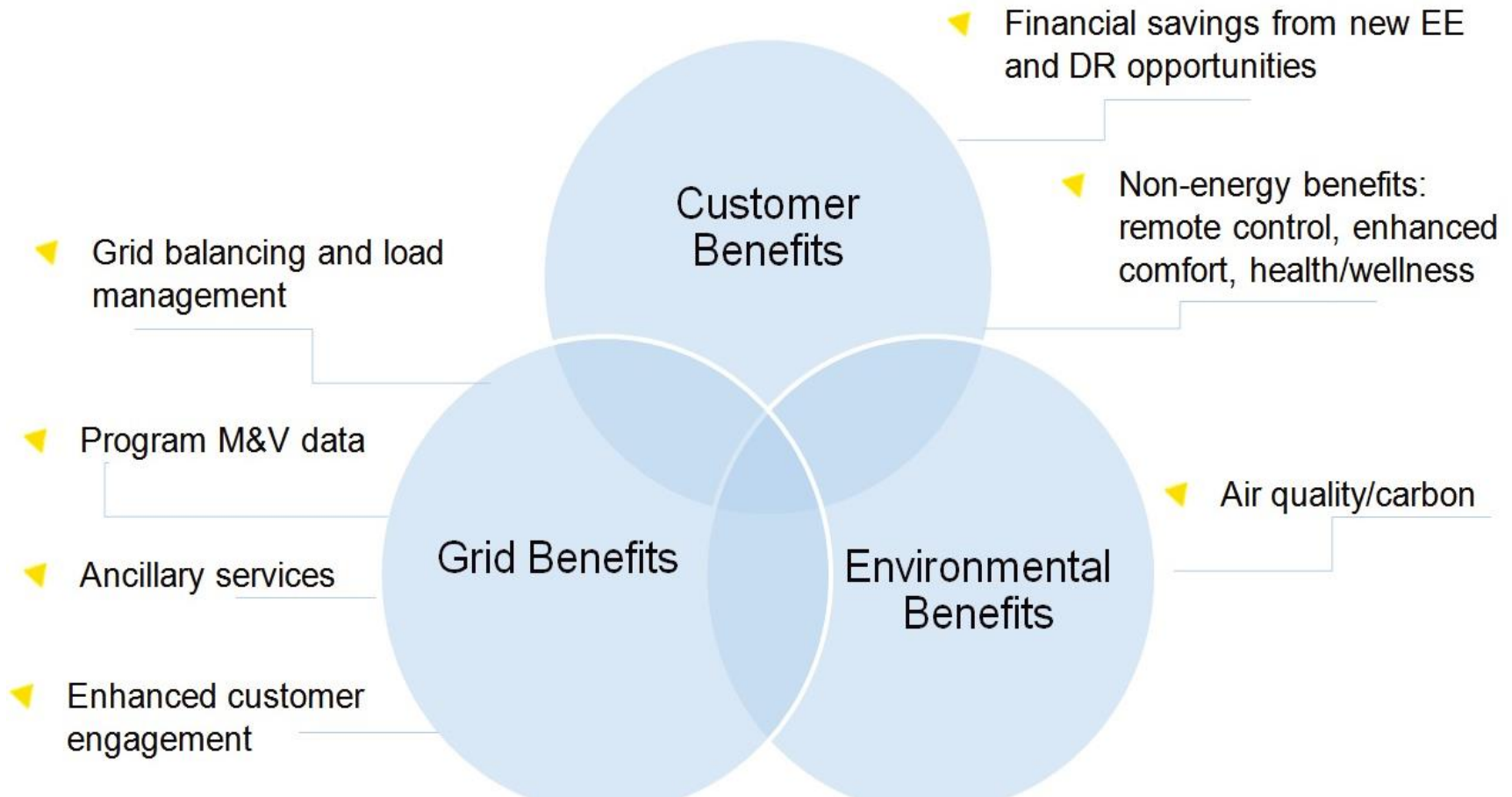


Specifying Functionality that Yields Grid & Customer Value

John Taylor
Deputy Director, CEE
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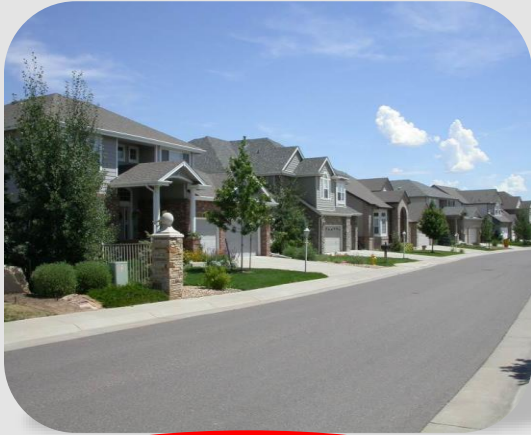
What are the Potential Benefits?



Why Might Consumers Value Smart Systems?

1. Seamlessly respond to dynamic electric rates
2. Interoperable with “behind the meter” distributed energy resources (e.g. solar)
 - ZNE homes
3. Participate in grid services
4. Confidence they “got what they paid for”

Broad Spectrum of Systems in Buildings



**Focus of
AHRI, CEE and
EPRI
collaboration**



High unit volume

Demand response

- Single family homes
- Small commercial
- Discrete systems
- Unitary a/c
- Water heaters
- A few kW per bldg.
- Very high unit volume
- Direct communication with HVAC & WH utilized
- Standardized utility programs
- PUC regulated

No building EMS

New a/c capabilities now available!!!

Demand response

Low unit volume

- Many kW per bldg.
- Low unit volume
- DR aggregators
- Negotiated contracts
- Large multistory com'l buildings
- Complex systems
- Chillers
- Heat recovery

Controls capabilities readily available

Sophisticated EMS

Which CEE Committees?

- ▶ Appliances
- ▶ Behavior
- ▶ Evaluation
- ▶ HVAC/Thermostats
- ▶ Lighting
- ▶ Pool Pumps
- ▶ Water Heating
- ▶ Whole House

CEE Member Consensus Reached

- ▶ Use of **open, non-proprietary, communication standards** to achieve interoperability are required....
- ▶ Establishing **multiple pathways to connect** is likely necessary to ensure the majority of consumers realize benefits...
- ▶ Maintaining a **direct line of site to location of** connected products at the “substation level” will maximize the load management benefits...
- ▶ Acceptable communication pathways must **secure customer data** and adequately protect privacy...
- ▶ Products are “controllable” and **responsive to price signals**...
- ▶ Connected devices must be “discoverable” and **disclose their ability for a utility signal** (or equivalent) to reach the connected product consistently...
- ▶ Capability to share **basic energy data** is required

Potential Elements to Standardize

▼ Communication protocols

▼ Connection resiliency

▼ Discoverable

- once registered

▼ Physical location

▼ Demand response availability

- status and ability to participate

▼ Peak period avoidance configurability

▼ Physical responses & response times

▼ Information responses

- What data, at what interval?