

PRICE RESPONSIVE APPLIANCES

CLIMATETALK OPEN STANDARDS

WINTER 2012 FACE-TO-FACE
IRVING, TEXAS • DEC. 3-6, 2012



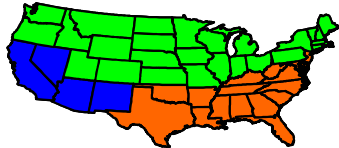
SGiP SMART GRID
INTEROPERABILITY PANEL

Grid-Interop 2012

Today's Smart HVAC Systems Address Contractor Needs

2

Market Pressures



Increasing Efficiency Standards



More Complicated Equipment



Fewer Qualified Technicians



Communicating Solutions

Simplify Installation of Hi Efficiency HVAC Systems



→ *Self Contained Systems*
→ *Wired Devices*

Proprietary Protocols Dominate and Fragment the Market

ClimateTalk Defines Interoperability

3

NEMA Wiring Standard

Single Stage
Furnace & AC



- ✓ Works for Legacy Installed Base
- ✓ Provides Interoperability
- ✓ Supports Training and Service

ClimateTalk Standard

Any System Configuration

- ✓ Multi-Stage or Modulating
- ✓ Heat Pump, Geo or Dual Fuel
- ✓ Integrated Zoning



- ✓ No New Wires
- ✓ No Dip Switches



INNOVATION:

- ✓ Quality Installation Indication
- ✓ Diagnostics Information
- ✓ Performance Monitoring



NEW APPLICATIONS:

- ✓ Variable Speed Unitary Controls
- ✓ Water Heating
- ✓ Air Quality
- ✓ Occupancy Sensing
- ✓ Demand Response

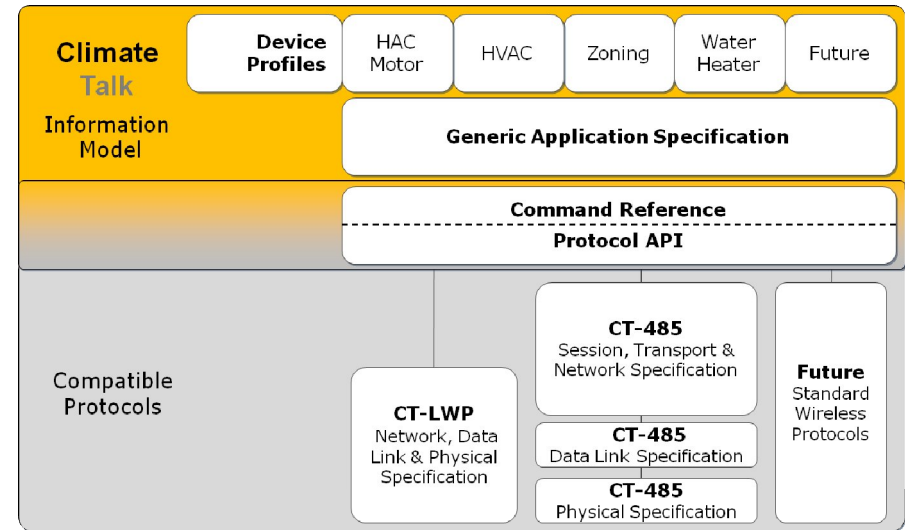
ClimateTalk is Uniquely Architected for Interoperability & Expansion

4

Built on OSI 7 Layer Model

- ✓ Separation of Application and Protocol
- ✓ Enables Interoperability with a Choice of Physical Medium

Applications Isolated from Physical Layer by Design



Smart Subsystems

- ✓ Each Application Controls Its Own Application, User Menus & Diagnostics
- ✓ Controls Support OEM Differentiation & New Applications

Distributed Control



Multiple Masters

- ✓ The Most Current Node on the HVAC Network Asserts Itself as the Coordinator
- ✓ All Nodes Can Function at the Most Recent Capability Set Possible

Future Proof



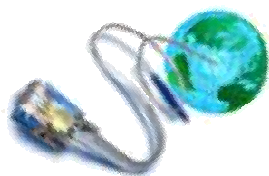
Next Step... Getting HVAC & Water Heater Systems Connected

5

Market Trends



Smart Grid

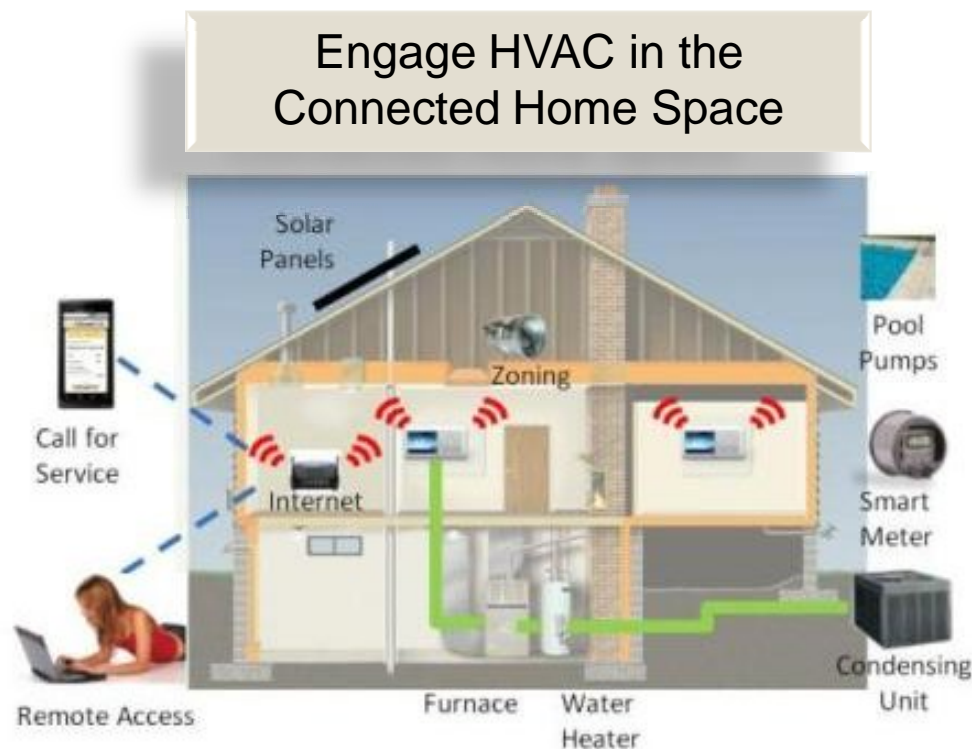


Internet of Things



Home Energy Management

Home Area Network Solution

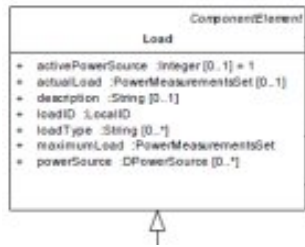


- Systems Connected Externally
- Wired and Wireless Devices
- Coordinated Control with New Devices

Open Standards Critical to Adoption

Connected, ClimateTalk Enabled Systems... The Possibilities!!

How much load has been shed?



PAP17: FACILITY SMART GRID INFORMATION STANDARD

ASHRAE SPC 201

Does the system meet regional standards?



Is the system installed properly?



Is it operating efficiently?

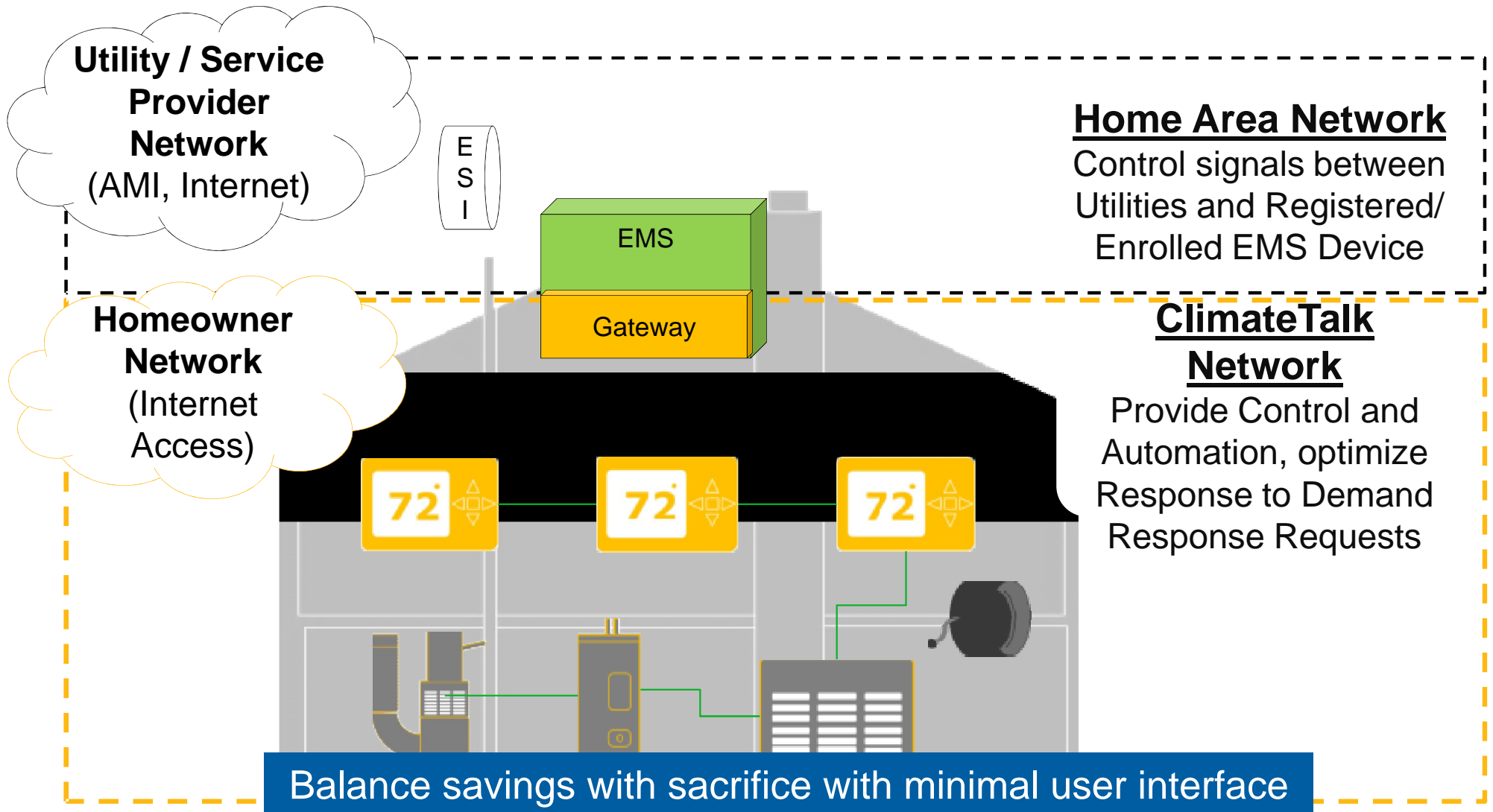


What is Wrong?







ClimateTalk Standards Enable Elegant Response to Price Signals

7



ClimateTalk is Complimentary to Industry Smart Grid Standards

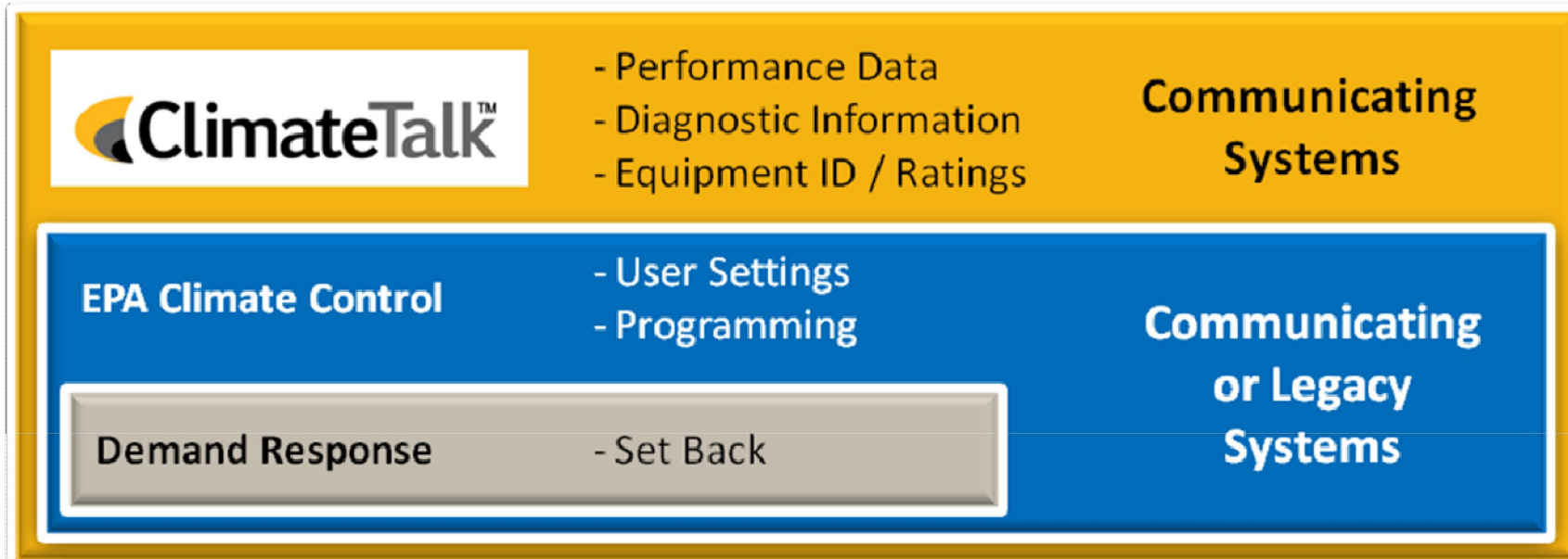
8

PROFILE	 ClimateTalk   OR 	Industry Benefits	
DEVICES	RCC Compliant T-stat	<ul style="list-style-type: none"> ✓ PCT ✓ IHD ✓ EMS 	<ul style="list-style-type: none"> Integrate Smart Energy Data Payloads in CT CIM ✓ Choice of physical medium ✓ Two way communication ✓ Verification of curtailment actions ✓ Improved user experience, advanced control, monitoring, enriched information
	Furnace		
	Air Handler		
	A/C		
	Heat Pump		
	Zoning		
	Water Heater	✓ Load Control	Augment Load Control Profile with User Interface & Diagnostics
FUNCTION	HVAC System Control	Energy Pricing & Demand Response Commands	Remote Access & DR Capable

For Legacy or Communicating Systems

An Open Architecture to Bring HVAC Into the Digital World

9



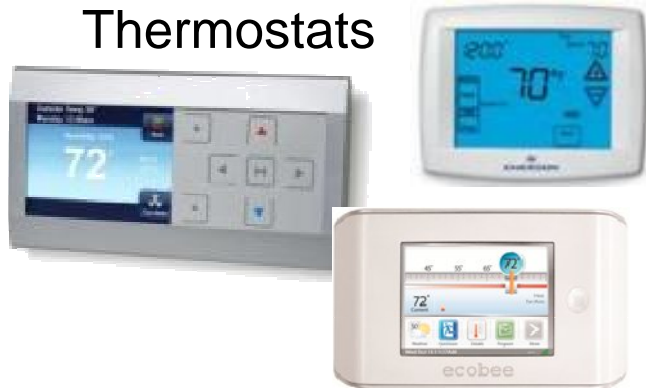
- Compliant with EPA Standards for Connectivity of Residential Climate Controls
- Enables Optimized, Systematic Demand Response
- Opens doors to Improved Diagnostics and New Service Models
- Provides a Foundation for Automated System Installation Verification

Delivering Value Today in Target Markets

10

Proven, Robust, Reliable

Thermostats



Furnaces & Air Handlers



A/Cs & Heat Pumps



4 Wire
ECM Motors
- Industry Standard



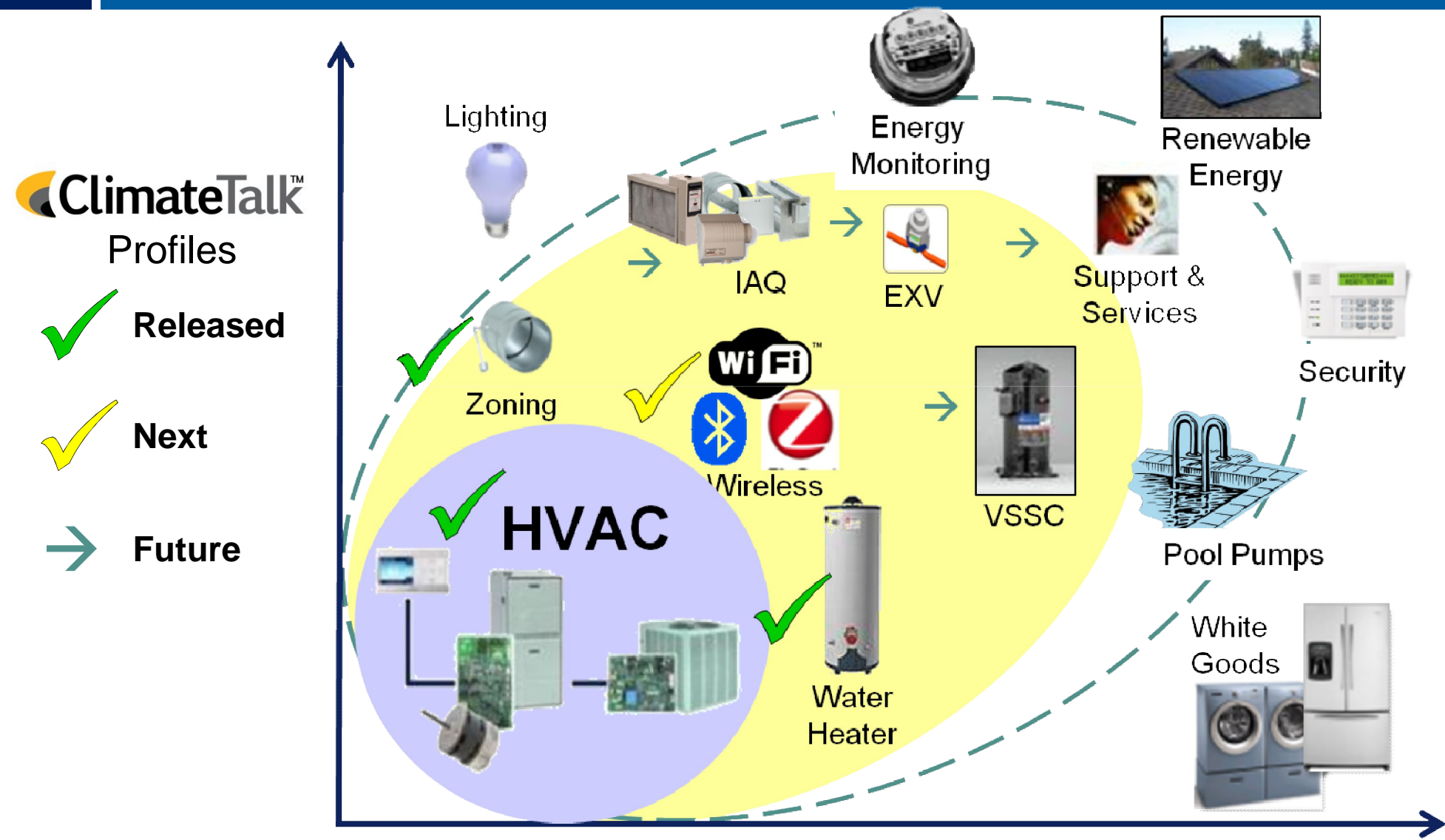
Zoning Controls



Over 2M ClimateTalk Devices in the Market Today

Enabling Coordinated Response for Automated Systems in the Home

11



ClimateTalk Standards Being Developed By Market Experts

12

Members



Advisory Group



Grid-Interop

WINTER 2012 FACE-TO-FACE
IRVING, TEXAS

Grid-Interop 2012

SGiP