

HVACR and Water Heating Industry Certification, Advocacy, and Horizons

Aykut Yilmaz
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we make life better™

What we will cover...

➤ Introduction to AHRI

- History
- The “Three Pillars” of AHRI
- How it Works: Membership and Governance

➤ Industry Trends

- Regulations
- Systems Efficiency
- “Smart” Equipment



AHRI: Air-Conditioning, Heating, and Refrigeration Institute

- **Is one of the nation's largest trade associations**
 - Representing over 300 HVACR and water heating manufacturers across 39 product sections
- **Administers rigorous certification programs**
 - 40 Certification Programs
- **Establishes international standards**
 - Nearly 100 industry standards and guidelines
- **Promotes policies beneficial to industry**
- **Represents the industry domestically & globally**
- **Administers a comprehensive industry statistics program**



Senator Johnny Isakson (R-Ga.), with AHRI President and CEO Stephen Yurek, Ed Purvis (Emerson Climate Technologies), and Harry Holmes (Morrison Products, Inc.)



AHRI History

- **Formed in 2008 in a merger between:**
 - ARI – Air-conditioning and Refrigeration Institute
 - GAMA – Gas Appliance Manufacturers Association
- **Gas-fired appliances since 1915
(National Boiler and Radiator Manufacturers)**



Member Profile

➤ **Our members manufacture:**

- Central air conditioning and heating equipment
- Water heating equipment
- Commercial and industrial air-conditioning, heating, and ventilation equipment
- Commercial and industrial refrigeration equipment
- Hydronic heating equipment
- Components for heating, air-conditioning, and refrigeration systems



Heating & Component Product Sections

- **Air Filtration and Ultraviolet Light Treatment**
- **Blowers, Fans & Motors**
- **Burners**
- **Commercial and Industrial Forced Air Heating**
- **Controls**
- **Direct Heating**
- **Flexible Metallic Gas Piping**
- **Fluid Pumps**
- **Furnaces**
- **Gas Detection and Analysis**
- **Heat Pump Pool Heaters**
- **Hydronics Institute**
- **Infrared Heaters**
- **Variable Frequency Drives**
- **Vent-free Gas Products**
- **Venting Products**
- **Water Heaters**
- **Zone Control System Technology**

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Cooling, Refrigeration, and Component Sections

- Air Control & Distr. Devices
- Air-Conditioning Heat Transfer
- Air-to-Air Energy Recov. Vent.
- Applied Packaged Systems
- Automatic Commercial Ice makers
- Chemical and Refrigerant Reclaimers
- Chilled Beams
- Commercial Refrigeration Manufacturers
- Compressors and Condensing Units
- Datacom Cooling
- Dehumidifiers
- Ductless Equipment
- Flow and Contaminant Controls
- Geothermal /WS Heat Pump
- Humidifiers
- Industrial Refrigeration and Heat Transfer Products
- Liquid Chillers
- Mobile Refrigeration
- Thermal Storage Equipment
- Unitary Large Equipment
- Unitary Small Equipment

Three Pillars of AHRI



Three Pillars of AHRI

See video at www.youtube.com/watch?v=t8Ymojesf1M

AHRI Certification

- 40 certification programs
- Foremost globally recognized HVACR & water heating certification program
- 400+ participants
 - 58 International Licensees from 16 countries
- Over 2,200 tests annually
- Accredited by Standards Council of Canada (SCC) to ISO 17065
- Testing contracted to several ISO-17025 accredited, third-party labs
- ENERGY STAR Certified Body
- DOE / CEC / NRCan Information Providers



History of AHRI Certification

- AHRI Certification Program dates back more than 80 years
- All GAMA Efficiency Rating Certified marks, I=B-R, and ARI Performance Certified marks have been replaced with the AHRI Certified mark.



Equipment Certified By AHRI

- Air-Cooling and Heating Coils
- Air and Water-Cooled Chillers
- Baseboard Heaters
- Central Station Air-Handling Units
- Commercial AC and Heat Pumps
- Commercial Refrigerators
- Datacom Cooling
- Direct Heaters
- Energy Recovery Ventilators
- Finned Tube Radiators
- Gas Purge Equipment for Use with Chillers
- Geo-Exchange Heat Pumps
- Ice-Makers/Ice Bins
- Indirect Water Heaters
- Liquid-to-Liquid Heat Exchangers
- Pool Heat Pumps
- PTAC/PTHP
- Reclaimed Refrigerant
- Refrigerant Recovery/Recycling Equipment
- Residential & Commercial Furnaces
- Residential & Commercial Water Heaters
- Residential & Commercial Boilers
- Residential AC and Heat Pumps
- Refrigerant Testing Laboratory Certification
- Room Fan-Coils
- Single Package Vertical AC and Heat Pumps
- Truck/Trailer Refrigeration Units
- Unit Coolers
- Unit Ventilators
- Variable Air Volume Terminals
- Variable Frequency Drives
- Variable Refrigerant Flow AC/HP
- Water Source Heat Pumps

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Online Directory: www.ahridirectory.org

- **AHRI Directory**
 - The portal between manufacturers and consumers
- **Over 1,900,000 product listings**
- **More than 177,000 visitors per month**



The screenshot displays the AHRI Directory website. At the top, the AHRI logo is accompanied by the text 'Air-Conditioning, Heating, and Refrigeration Institute'. To the right is a 'AHRI CERTIFIED' badge with the website URL. The main heading is 'Directory of Certified Product Performance', followed by a description: 'The trusted source of performance certified heating, ventilation, air-conditioning, and commercial refrigeration equipment and components.' Below this, there are two expandable sections: 'RESIDENTIAL' and 'COMMERCIAL'. The 'RESIDENTIAL' section lists: Air Conditioners and Air Conditioner Coils, Baseboard Radiation, Boilers, Direct Geoeexchange Heat Pumps, and Direct Heaters. The 'COMMERCIAL' section lists: Air Cooled Chilling Packages, Air-to-Air Energy Recovery Ventilators, Automatic Commercial Ice-Cube Machines and Ice Storage Bins, Boilers, Central Station Air-Handling Units, Combo Systems, Comm. Refrigerated Display Merchandisers And Storage Cabinets, Finned Tube, and Forced Circulation Air Cooling and Air Heating Coils. On the right side, there are links for 'Are you a Manufacturer?' and 'Are you a CAFS User?', both with 'Sign In' links. Below these is a 'Resources' section with links to 'Verify Certificate', 'Non-AHRI Certified Equipment Challenge Test Results', 'AHRI Announces New Certification Mark; Implementation Schedule', 'Find ENERGY STAR Qualified Air Conditioning and Heat Pump Systems', 'Find Standards', 'Learn more about Certification Programs', 'Find NATE-certified HVACR contractors', and 'Help with this site'. At the bottom, a copyright notice for 2009 is followed by links for 'Home', 'Terms and Conditions', 'License', 'Data', and 'Disclaimer'.

AHRI Air-Conditioning, Heating, and Refrigeration Institute

AHRI CERTIFIED™
www.ahridirectory.org

Directory of Certified Product Performance

The trusted source of performance certified heating, ventilation, air-conditioning, and commercial refrigeration equipment and components.

RESIDENTIAL

- > Air Conditioners and Air Conditioner Coils
- > Baseboard Radiation
- > Boilers
- > Direct Geoeexchange Heat Pumps
- > Direct Heaters

COMMERCIAL

- > Air Cooled Chilling Packages
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Are you a Manufacturer? | [Sign In](#)

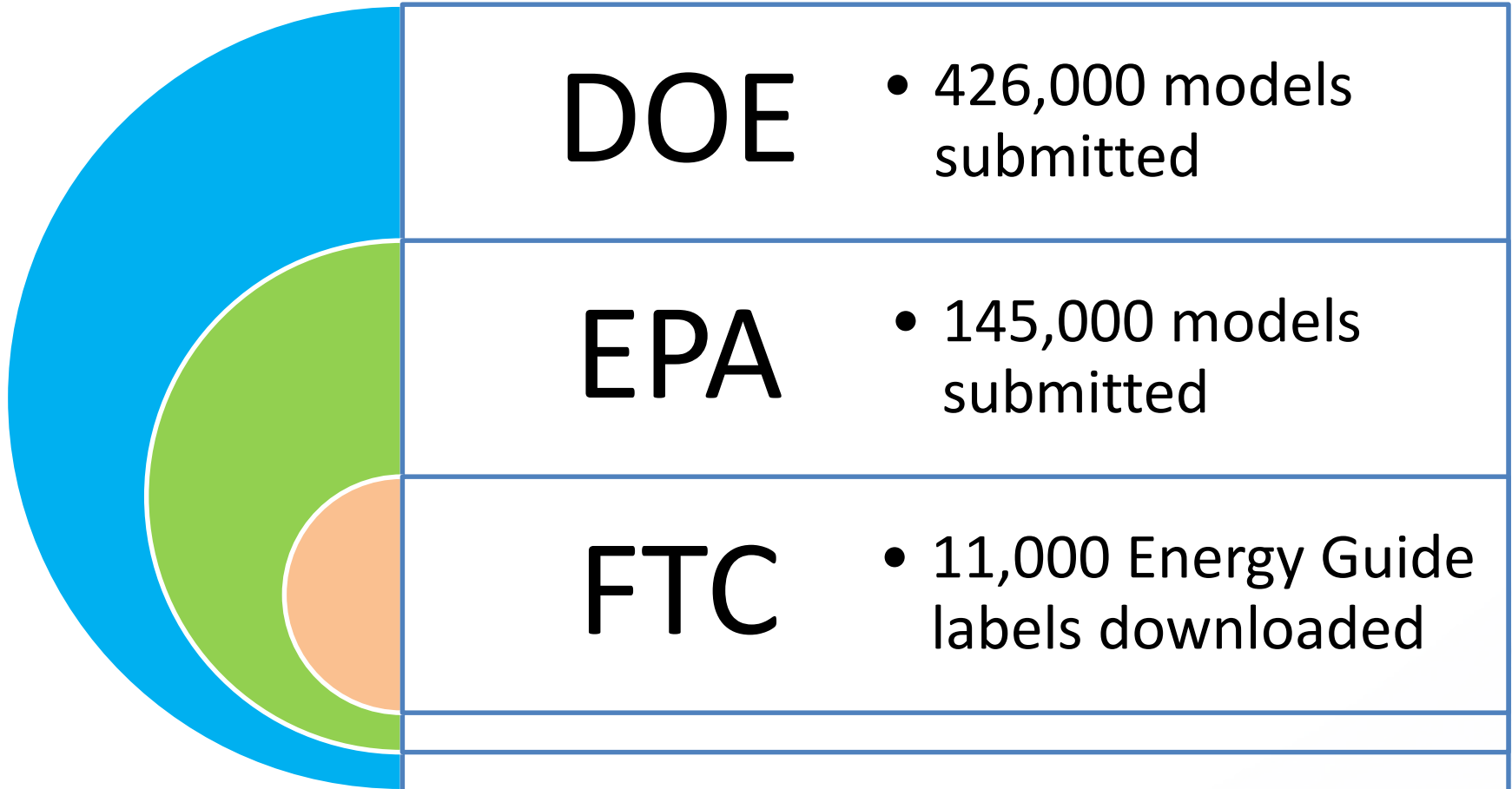
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Resources

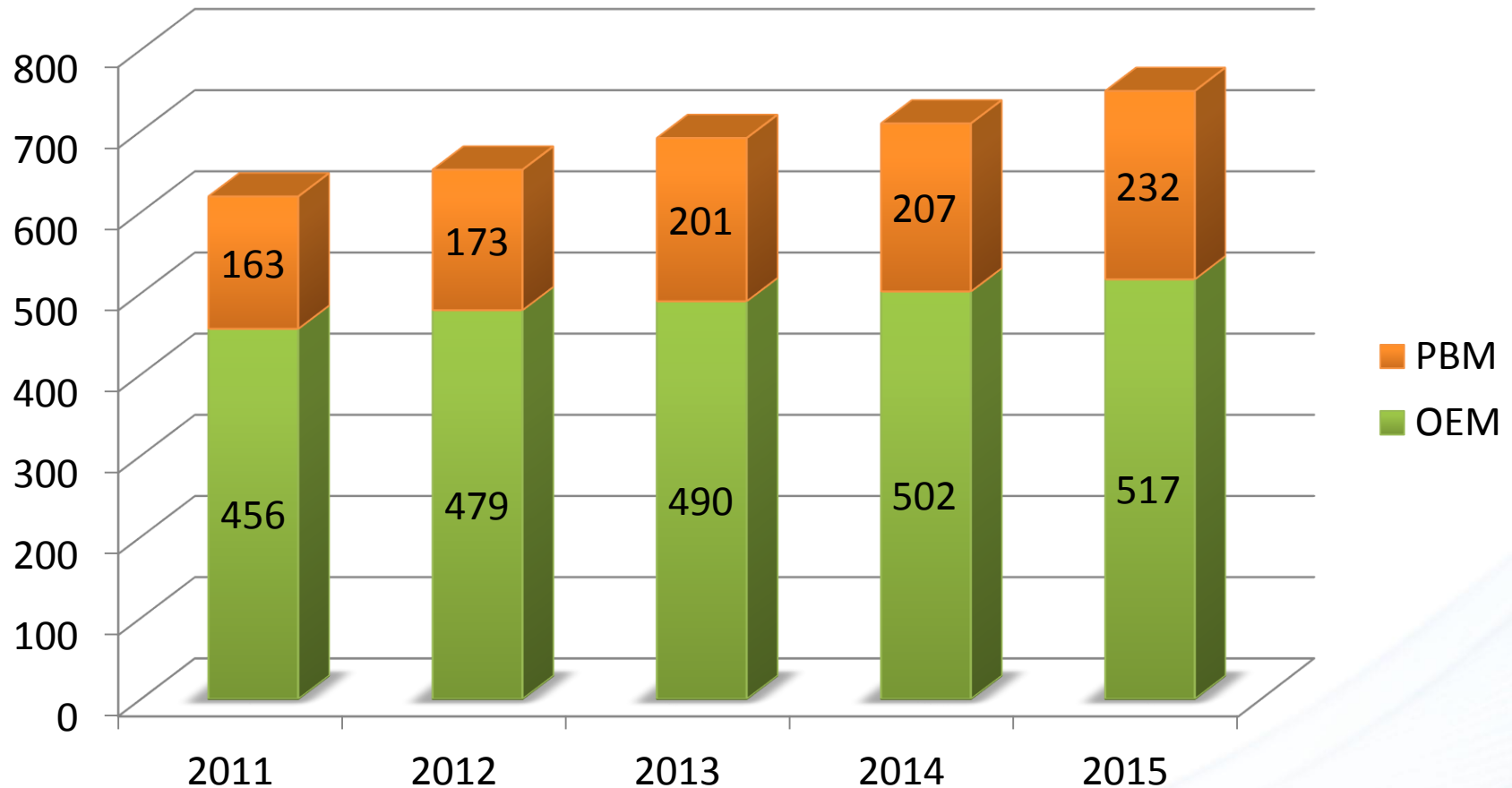
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[Data](#) | [Disclaimer](#)

Directory of Certified Product Performance



Certification Licensees Continue to Grow



Joining an AHRI Certification Program

➤ Application Submittals

- Application is separately applied to each Certification Program
- Ratings provided for all models (Certify All)
- Exact process can vary from program to program
 - Refer to program-specific Operations Manual

➤ Testing

- Products tested from each manufacturer, each year
- Conducted by a 3rd party lab (not AHRI)

Standards



Standards

- **AHRI has published more than 100 standards and guidelines**
 - Many in both I-P and SI
 - Majority are designated American National Standards by ANSI
- **Regularly work with organizations and governments around the world to help them either adopt or harmonize our standards**
- **Accredited by the Standards Council of Canada to develop National Standards of Canada**



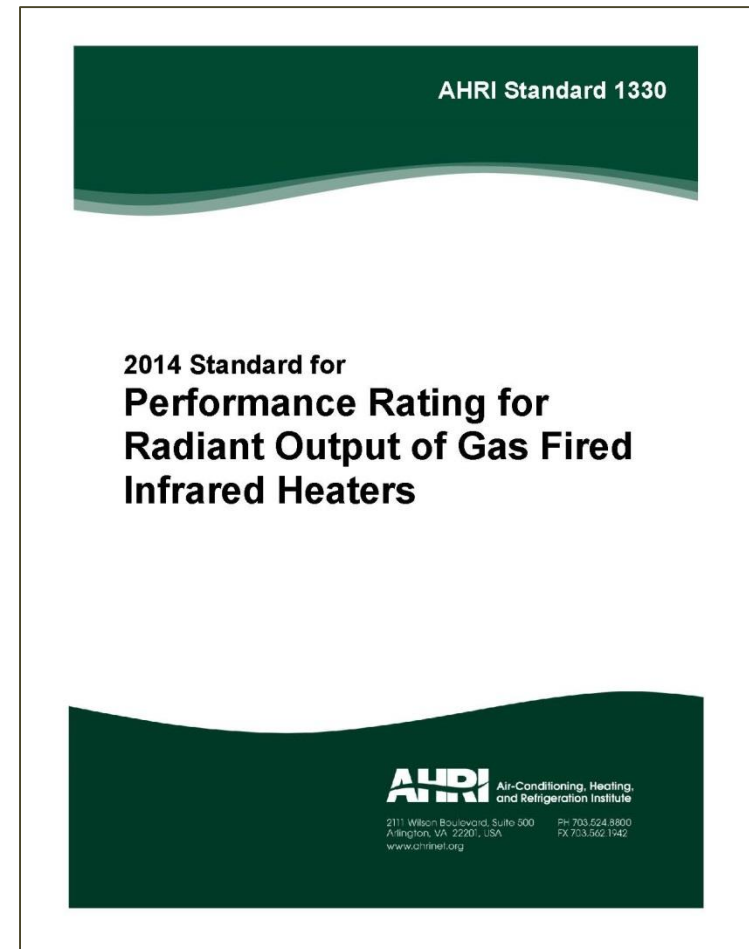
Standards – Heating products

➤ New:

- AHRI 1330-2014 – Radiant Output of Gas-fired Infrared Heaters
- ANSI/AHRI 1500-2015 – Commercial Space Heating Boilers

➤ Under development:

- Draft AHRI 1260P – Portable Combustion Gas Analyzers
- ASHRAE/AHRI 155P – Commercial Space Heating Boilers



Advocacy

Government Affairs

- **U.S. Congress**
- **Federal Agencies**
 - Department of Energy
 - Environmental Protection Agency
 - Department of Commerce
 - Federal Trade Commission
- **State Governments**
- **Foreign Organizations and Governments**
 - Standards Adoption and Harmonization
 - Performance Certification
 - International Trade Issues



Safety Issues

- **Member of UL / CSA committees**
 - Z21/83 Standards
 - UL STP 296
- **Track Fuel Gas Codes Activities**
 - NFPA, ICC
- **State Regulations**
 - Plumbing, Fuel Gas, and Oil Codes
 - e.g. PVC venting issues
- **Publications**

Heating safely
with gas-fired
infrared heaters

FROM THE
INFRARED HEATER
SAFETY COUNCIL

IRSC
INFRARED HEATER SAFETY COUNCIL
An AHRI Initiative
AHRI


irsafetycouncil.org

Patio Heaters

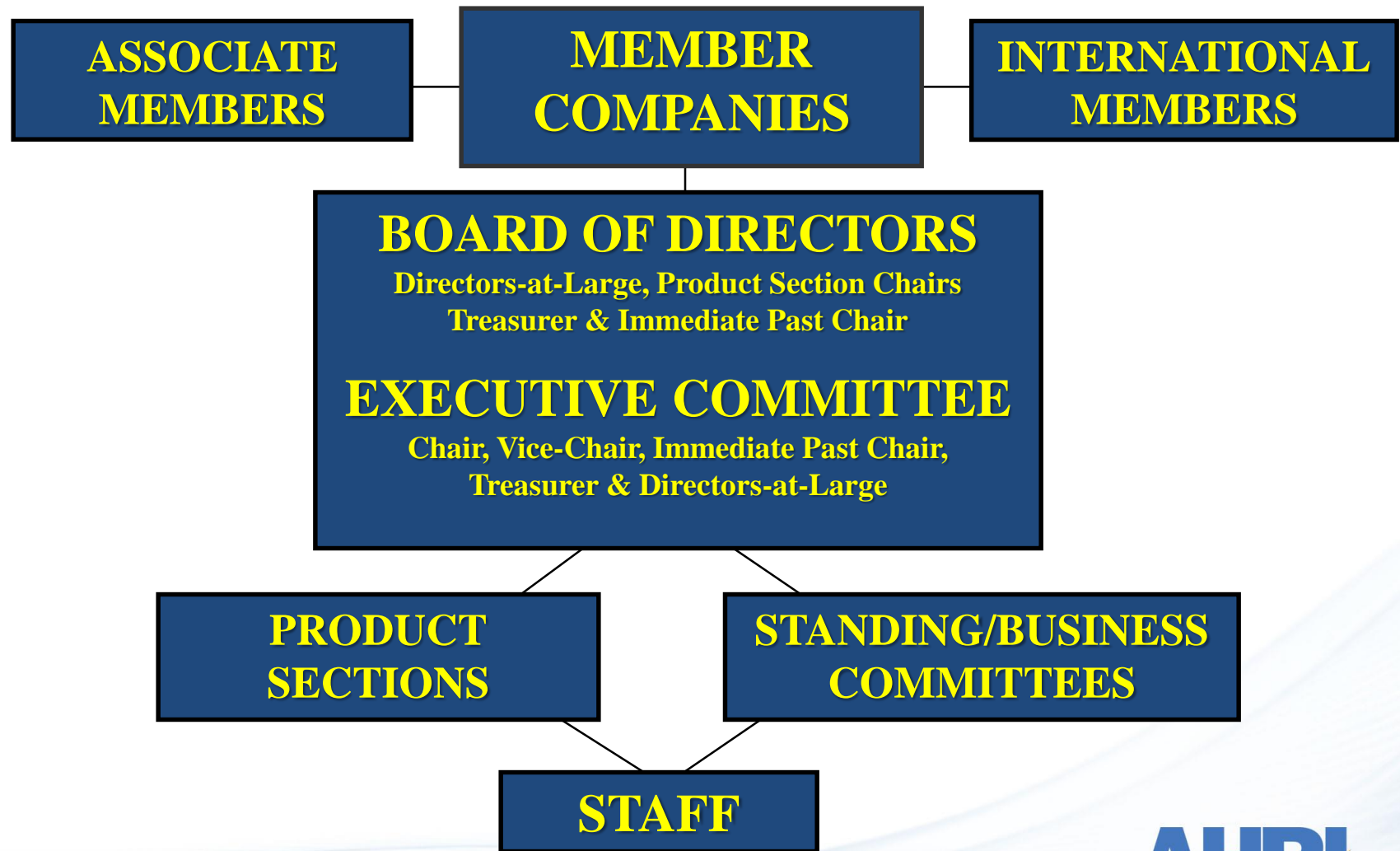
High Intensity Ceramic Heaters

Low Intensity Tube Heaters

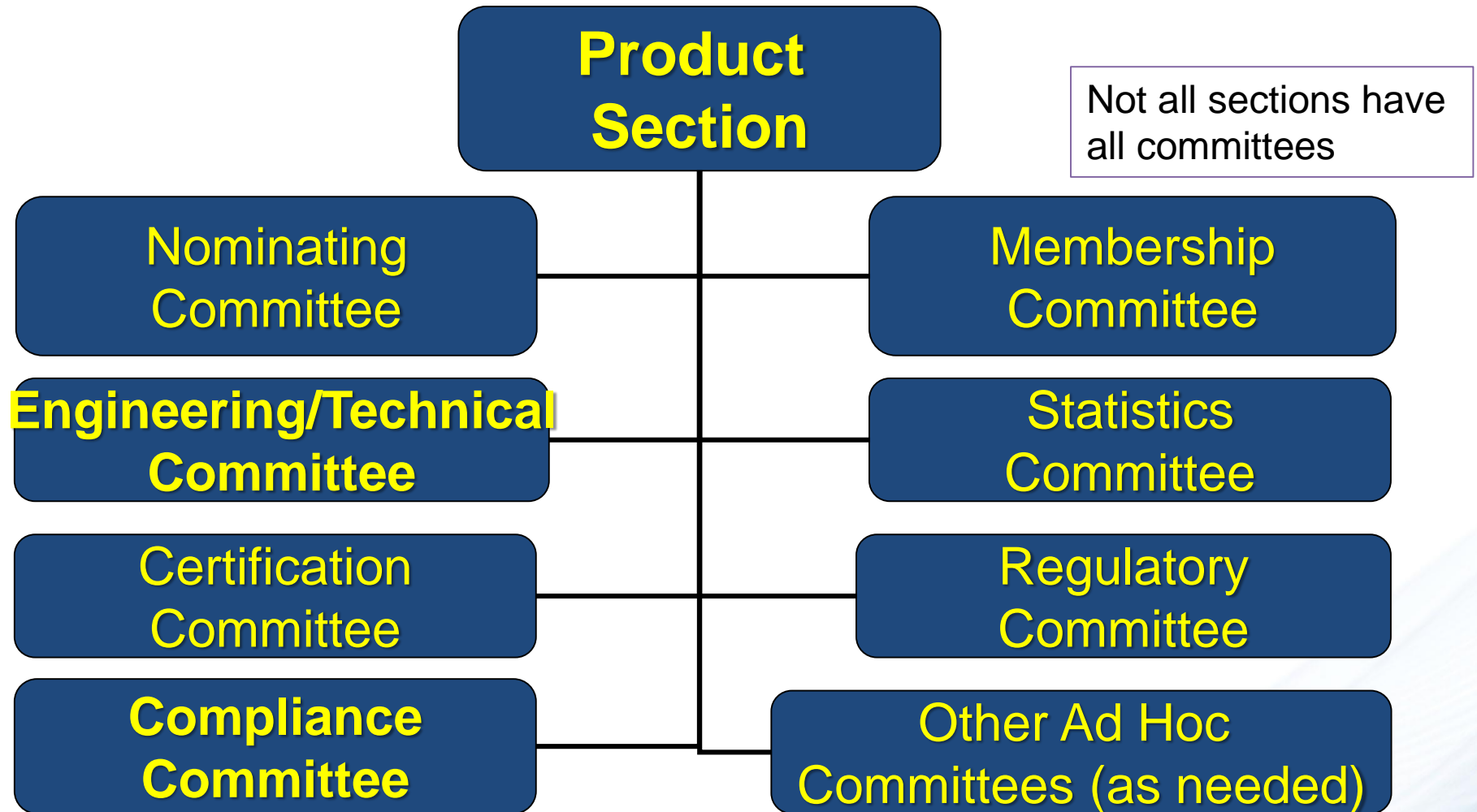
Construction Heaters



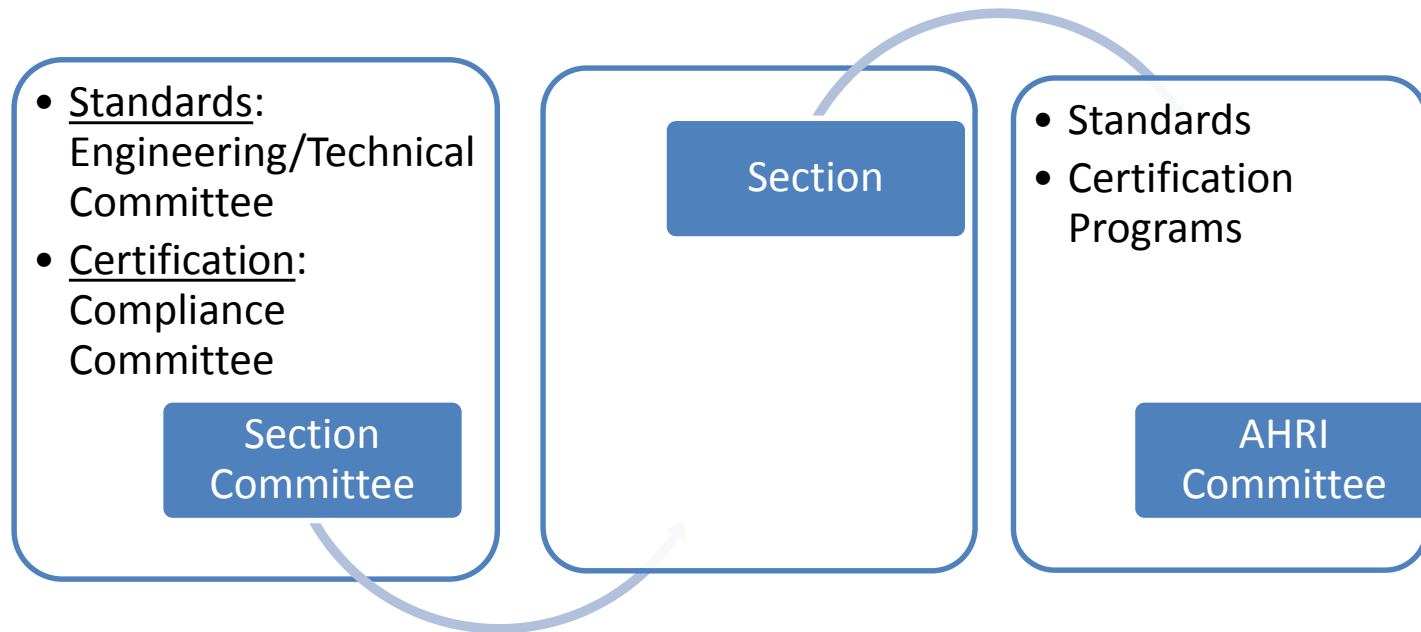
Structure - AHRI



Product Section Organization



Approval Process



Industry Trends

Increasing Efficiency Regulations

➤ The players:

➤ U.S.

- Department of Energy (DOE)
- Environmental Protection Agency (EPA)
- Federal Trade Commission (FTC)
- Consumer Product Safety Commission (CPSC)
- California Energy Commission (CEC)
- State Air Quality Control Districts, e.g. SCAQMD

➤ International

- Natural Resources Canada (NRCan)
- EU Directives
- Emerging Markets

Increasing Efficiency Regulations – DOE Rulemaking

- **2015-2016 Expected Rulemakings**
 - Single package vertical units
 - Unitary large equipment
 - Commercial furnaces
 - Residential furnaces
 - ASHRAE 90.1 products
 - Hearth products
 - Residential Boilers
 - Packaged Terminal equipment
 - Commercial Pumps
 - Commercial fans and blowers



Increasing Efficiency Regulations – DOE Rulemaking

- Legal authority under EPCA, NAECA, and various amendments
- Process:
 1. Establish Test Procedures
 2. Establish Minimum Efficiency Performance Standards (MEPS)
 3. Repeat!
- Steps:
 1. Request for Information/Framework Document
 2. Notice of Proposed Rulemaking (NPR)
 - Supplemental NPR if necessary
 3. Final Rule
 4. Delay until final implementation
 - Test procedure: 6 months
 - MEPS: 3 to 5 years

Increasing Efficiency Regulations – DOE Rulemaking

- **What trends are we seeing?**
 - Rulemaking is more hurried
 - MEPS before Test Procedures
 - More frequent changes that are increasingly aggressive
 - Added scope of regulations
 - More data collection (certification reports)
 - More enforcement activity
- **Why are we seeing this?**
 - Climate Change and social health concerns
 - Pressure from Energy Efficiency Advocates
 - Lack of Congressional action
 - Ideology

Increasing Efficiency Regulations – DOE Rulemaking

- **How are manufacturers impacted?**
 - **Product redesigns**
 - **Product testing**
 - **Cost to respond to rulemaking**
 - **Changed marketplace**
 - **Greater chance of penalties**

Increasing Efficiency Regulations – DOE Rulemaking

➤ Examples

➤ New metrics

- Residential Water Heaters UEF
- Pool Heaters Integrated Thermal Efficiency
- Standby/Off-mode electrical consumption
- Furnace Fan Energy Rating

➤ Stringent standards

- 92% AFUE Furnace Standard (proposed)
- Residential Water Heater > 55 gal must be Heat Pump/Condensing Gas

Increasing Efficiency Regulations – DOE Rulemaking

- **AHRI Strategy**
 - **Negotiate**
 - Engage stakeholders
 - Most effective if put into law
 - **Engage**
 - Respond to Rulemaking documents
 - Legal and Technical evaluations
 - Input of AHRI members is indispensable
 - **If Negotiating and Engagement fails, Oppose**
 - Petitions for reconsideration
 - File lawsuits if procedures were not followed
 - Add pressure on DOE via Congress to address industry concerns
 - Lobbying
 - Public Awareness Campaign
 - Change rules about how DOE regulates

Systems Efficiency

- Currently using Appliance MEPS
- Appliance efficiency \neq building efficiency
- System Efficiency needs to consider:
 - Components
 - Subsystems
 - Building impacts
 - Seasonal impact

Systems Efficiency

- **Gas-fired commercial boiler example:**
 - **Currently rated with Thermal Efficiency**
 - 80°F return, 180 °F supply
 - Maximum input rate
 - **Actual energy use of a hydronic system:**
 - Water temperature $\Delta T \neq 100$ °F
 - Actual temps. depend on heat exchangers
 - Modulation/cycling
 - Optional DHW
 - Component energy
 - Pumps
 - Blower
 - Controls
 - Pilot energy

Systems Efficiency

- A recent study by ACEEE showed that the USA has some of the highest component efficiencies and most complex prescriptive requirements in the world, but ranks 13th out of 16 major countries in efficiency.
- Global initiatives are starting to move in new directions as shown by the Second European Directive and new initiatives in Canada. ASHRAE 90.1 is also looking moving this direction.
- The industry needs to be more proactive and take the lead on efficiency improvements with strong initiatives to move away from the component approach toward a subsystem and system approach while addressing the continued sustainability of the equipment and systems

Systems Efficiency

- **AHRI's Board of Directors has established a Systems Steering Committee to coordinate activities**
- **AHRI Product Sections are developing and executing strategic plans to address commercial systems**
 - Commercial Boilers
 - Commercial Furnaces
 - Commercial Water Heaters
 - Direct-fired Commercial/Industrial Heaters
 - Unit Heaters
- **Plans have 5-10 year executable goals**
- **May result in new metrics, new certifications, computer models, etc.**

Smart/Grid-enabled Equipment

- **Technology to connect utilities with equipment is available, but is basic**
 - **Manages peak-demand and energy storage with on/off controls**
 - **Growing importance**
 - **MEPS for grid-enabled residential water heaters**
- **AHRI Smart & Connected Ad-hoc Committee**
 - **Completed Proposed Framework for Demand Response Performance and Communication Specifications for Smart/Connected Variable Capacity Unitary HVAC Equipment**
 - **Will start first for unitary AC equipment, then may expand further**

Questions?

