



EPRI

ELECTRIC POWER
RESEARCH INSTITUTE

Coordinated Early Deployments of Efficient End-Use Technologies: Phase 1

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**ACEEE Energy Efficiency as a Resource
Conference**
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Topics

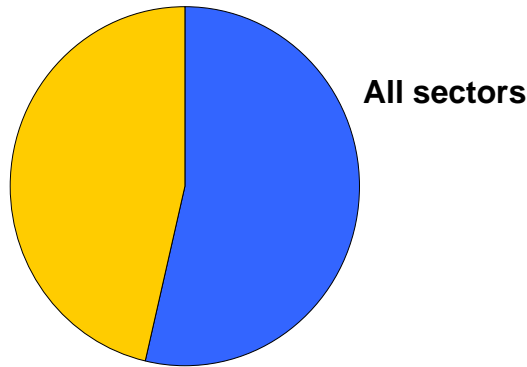
- Energy efficiency challenge
- Pipeline
- EPRI energy efficiency research
- Coordinated Early Deployments Phase 1
- Phase 2



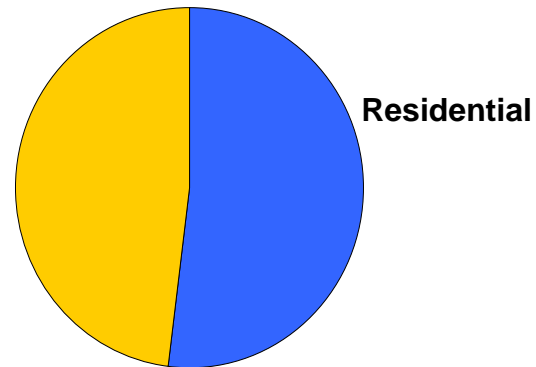
Significant Energy Savings from CFLs



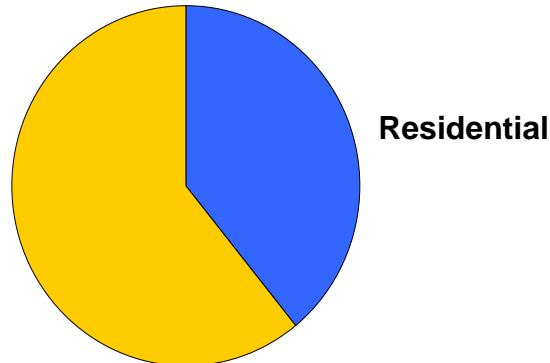
California, 53%



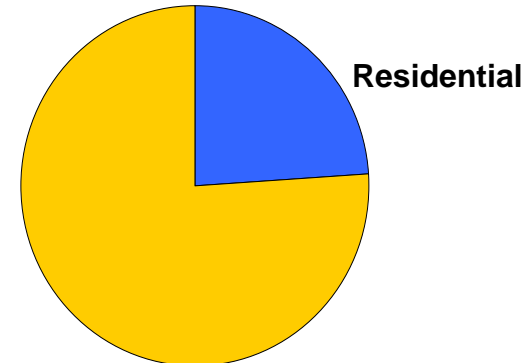
Massachusetts, 52%



Vermont, 39%



New York, 24%



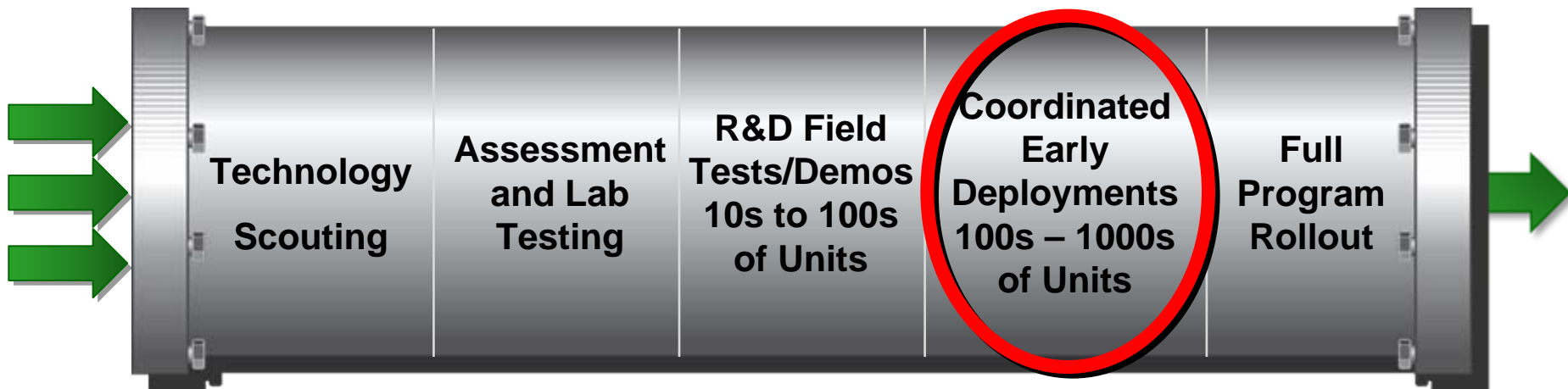
2009 Savings

-  CFL Savings
-  All Other Savings

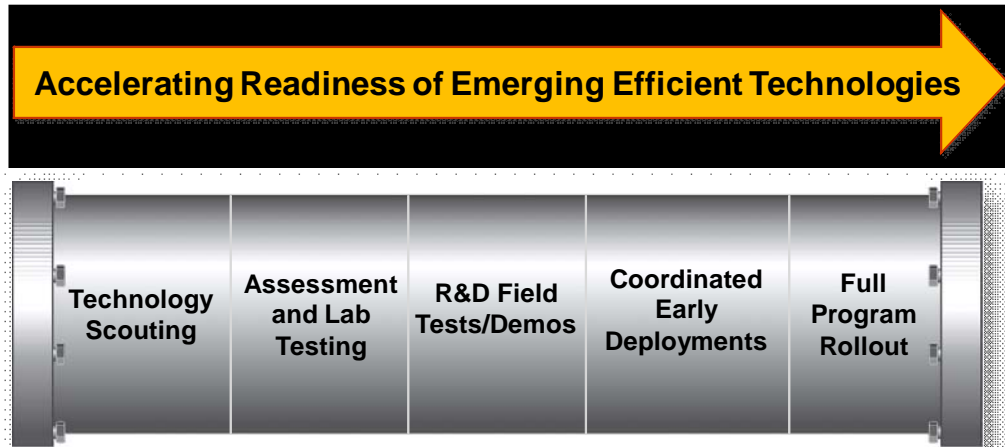
EISA 2007 Lighting Efficiency Standards will Change That!

End-Use Technology Pipeline

Accelerating Readiness of Emerging Efficient Technologies



Coordinated Early Deployments of Efficient End-Use Technologies: Phase 1



Benefits

- Accelerate readiness of technologies for utility programs
- Improve market adoption
- Reduce costs of achieving energy savings goals

Objectives

- Streamline process for early deployments
- Coordinate to share results
- Mitigate market barriers

Scope

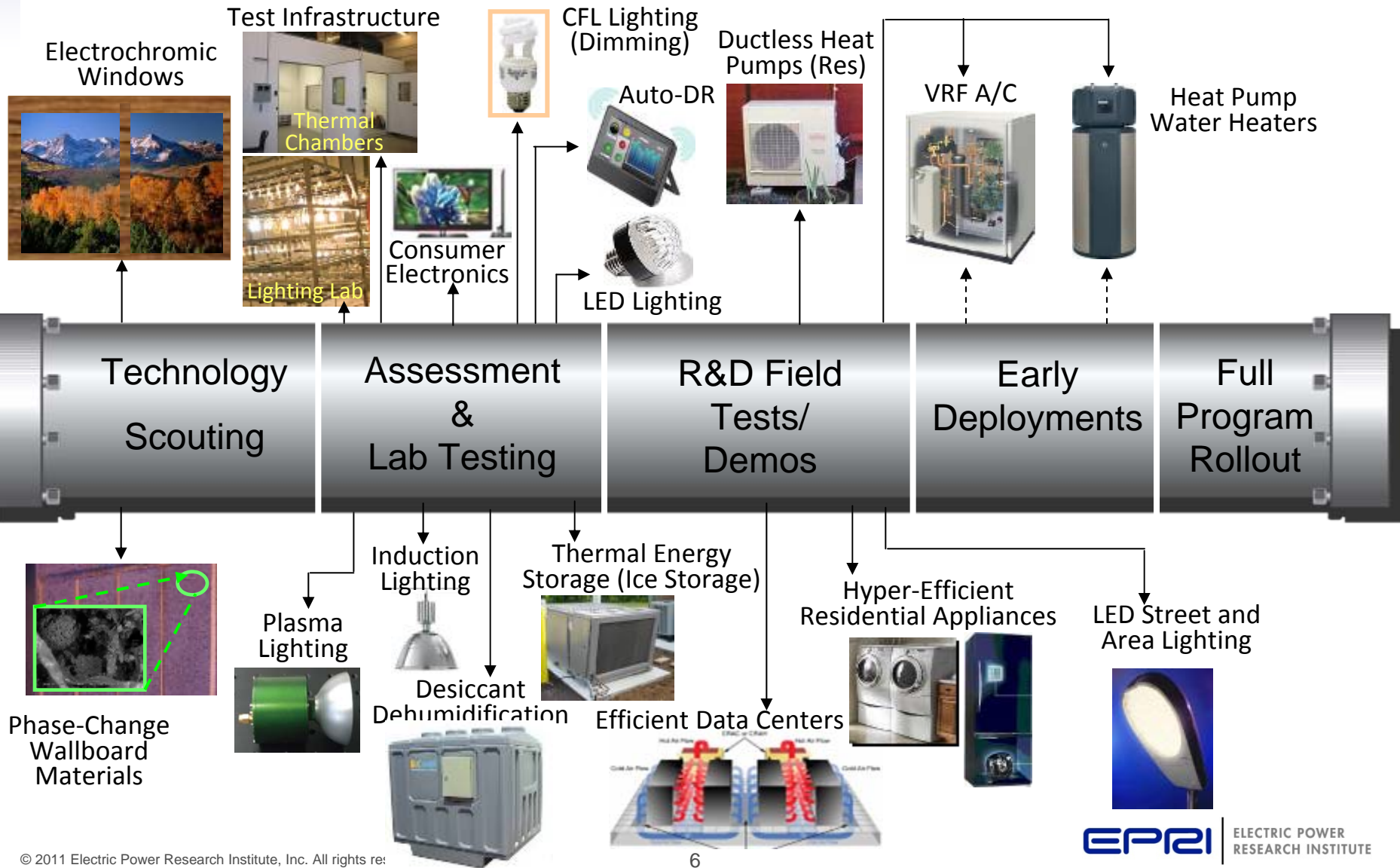
- Phase 1 (2011) – *13 funders*
 - Assess technologies for early deployment readiness
 - Develop framework for planning and implementing early deployments
 - Plan early deployments with 2 utilities (Duke Energy & TVA)
- Phase 2 (2012 – 2014) – *In development*
 - Collaborative with hosts and participants
 - Implement early deployments with 3 to 5 utilities

Contact

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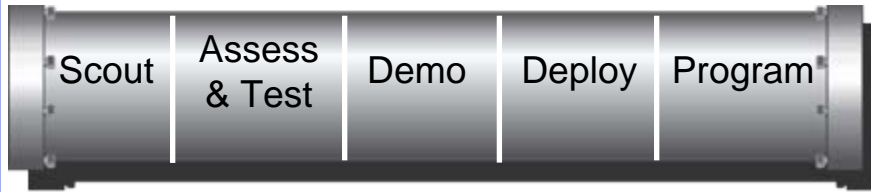
EPRI Energy Efficiency Technology Pipeline

Sampling of EE Technologies Currently Under EPRI Evaluation



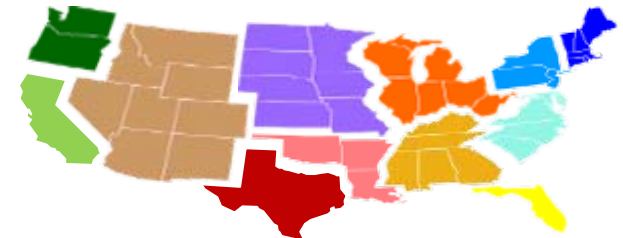
Analytics Complements Technology Research

EE Technology Pipeline



Vetting emerging technologies to accelerate program and market adoption

EE & CO₂ Potential Analysis

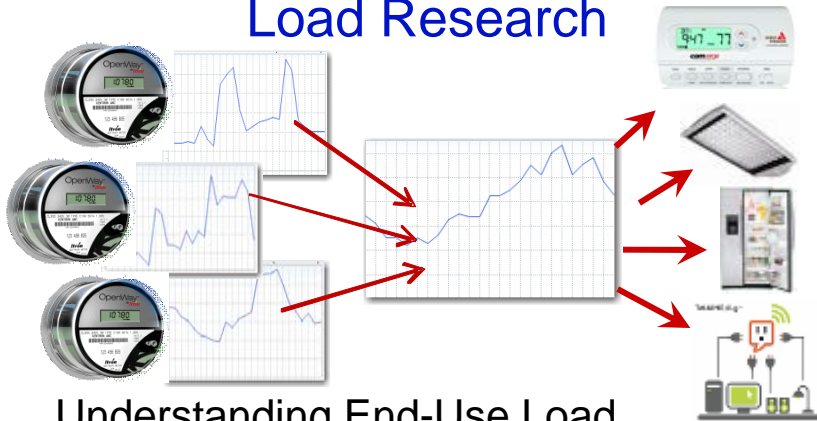


Quantifying EE & CO₂ potential for emerging technologies by region



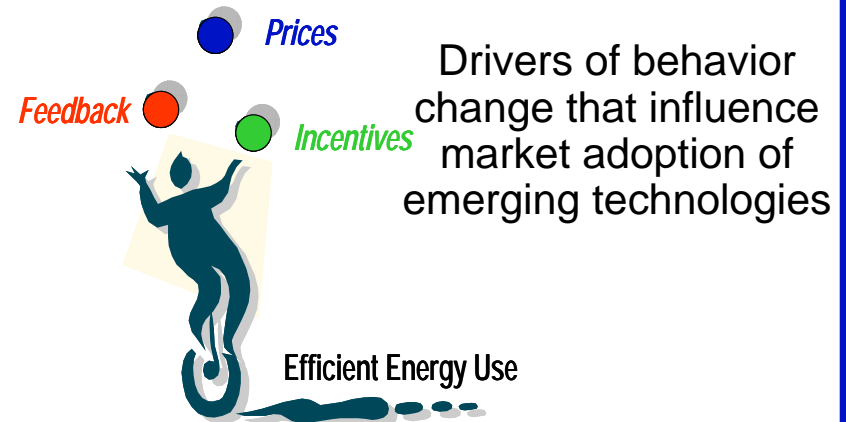
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Load Research

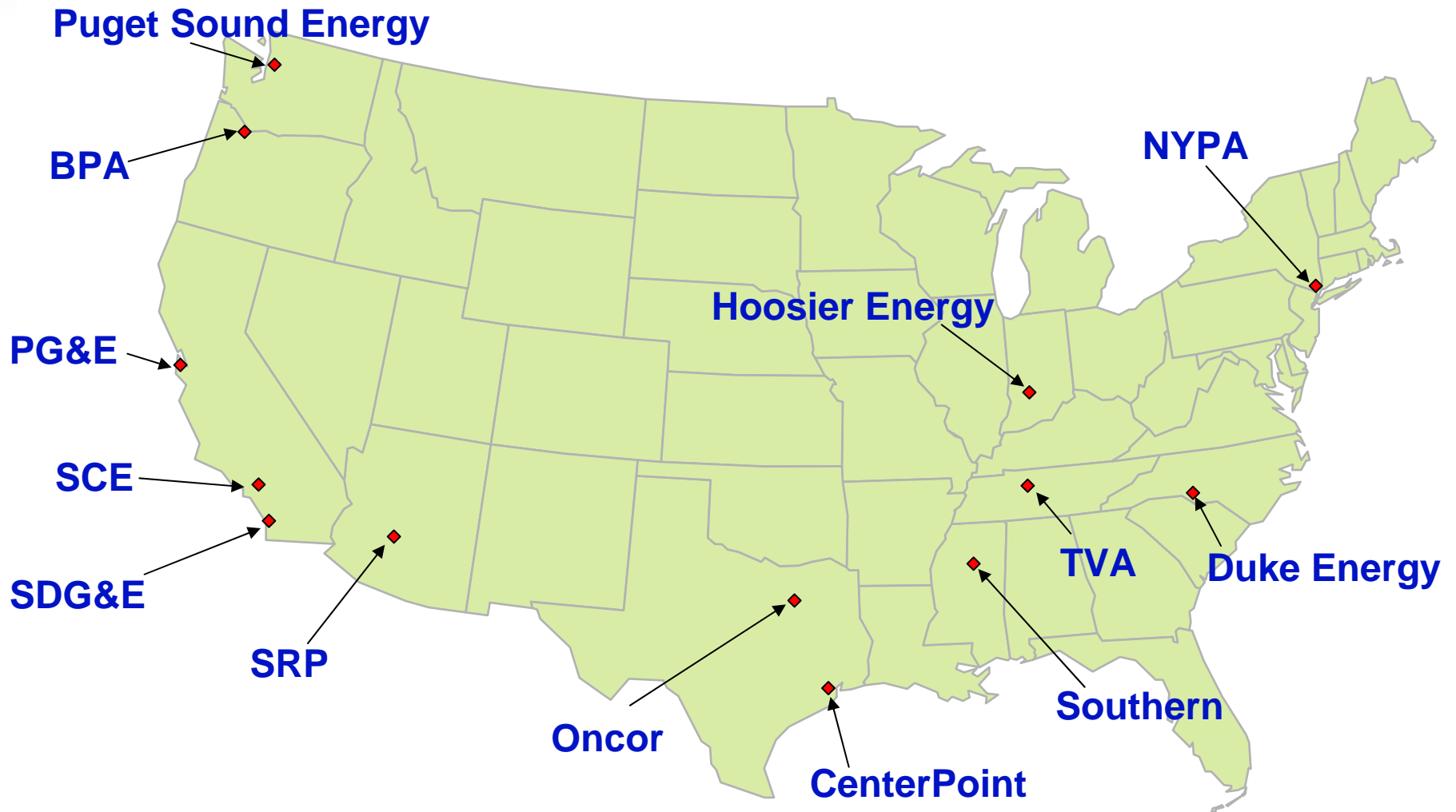


Understanding End-Use Load Shapes of Emerging Technologies

Understanding Customers



Coordinated Early Deployments Collaborators



Phase 1 Focus Areas

1. Technology readiness
2. Early deployments planning framework
3. Utility-technology specific early deployment plans
4. LED street lighting – ready for utility programs?
5. Phase 2 recommendations



Early Deployment Readiness Qualification Process

Required Criteria

- Demonstrated in field
- Estimated energy savings
- Commercially available
- UL rated, meets standards

No

Back to pipeline

Yes

Scored Criteria

- Energy and demand savings
- Customer benefits
- Financial– First cost, TRC
- Technical – Risk
- Environment/ Safety – Human, environmental impacts
- Institutional – External, internal drivers

READY!

Early Deployment Qualified Technologies

Qualified

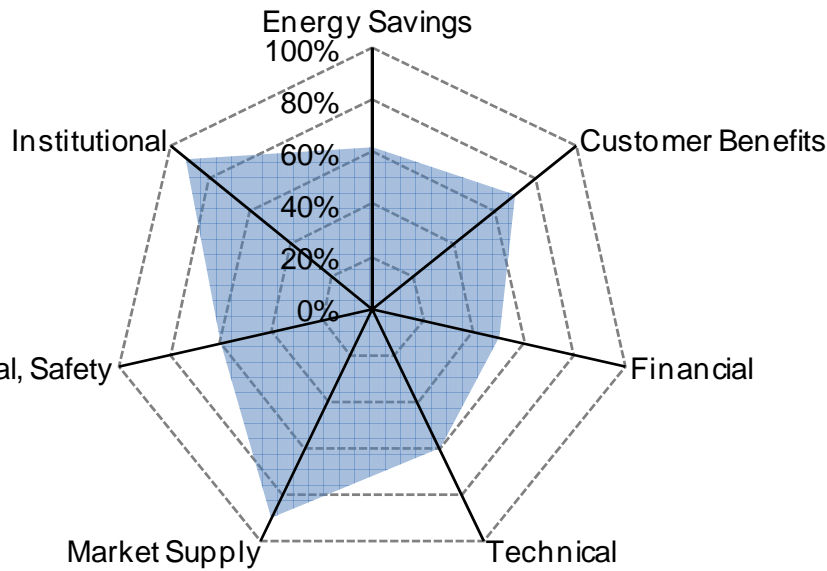
- LED street lighting
- LED outdoor lighting
- Climate appropriate conditioners -- Hot/dry
- Rooftop unit AC with fan controls, pre-cooling
- Ductless heat pumps
- Variable refrigerant flow AC
- Heat pump water heaters - residential
- Voltage optimization/conservation voltage reduction

Back into pipeline – concepts not proven, energy-saving products

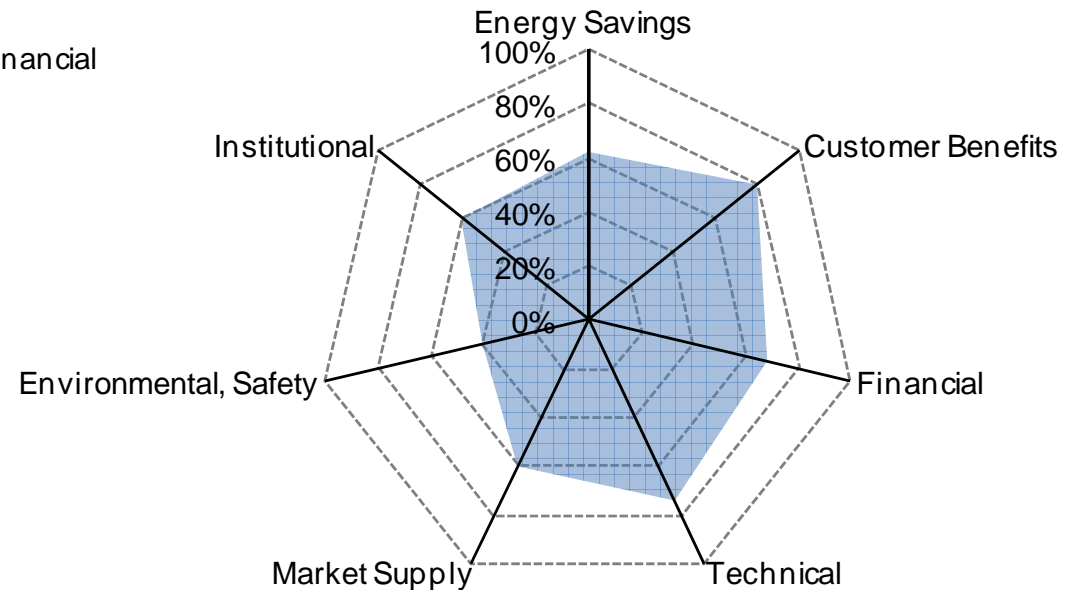
- Business area networks – communicating with utility
- Home area networks – communicating with utility
- Climate appropriate conditioners -- Hot/humid

HPWH and VRF Scores

Heat Pump Water Heater Residential (South)



Variable Refrigerant Flow A/C Commercial



Early Deployment Plans - TVA

- Residential hybrid water heater
 - 30 to 50% energy savings
- Potential market barriers
 - First cost
 - Lack of knowledge
- Plan efforts
 - Target market qualitative research
 - Supply chain strategy
 - Research questions
 - Scaling results from the early deployment



Early Deployment Plan – Duke Energy

- Commercial variable refrigerant flow air conditioning
 - Energy savings – 25-45%
 - Increased comfort
- Potential market barriers
 - Lack of knowledge
 - Building owner/tenant divide
- Plan focus
 - Target market qualitative research
 - Supply chain strategy
 - Research questions
 - Translating results from case studies



Phase 2: Launch Coordinated Early Deployments

- Phase 2: 2012 – 2014
- Collaborative with participants and hosts
- Hosts deploy VRFs, HPWHs and 3 other qualified technologies
- Collaborative continues to assess emerging technologies for early deployment readiness



In Summary...

Collaboration to

- Create process
- Share results
- Move markets
- Satisfy customers
- Achieve efficiency goals *cost effectively*



Together we can accelerate technologies

Riding the Efficiency Pipeline!



Together...Shaping the Future of Electricity