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The Building Technologies Program: Building Toward a Better Future

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Introduction to ET Activities
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The Building Technology Program in DOE/EERE uses an Integrated Approach to Deliver Energy Savings

Research & Development

- Develop technology roadmaps
- Prioritize opportunities
- Solicit and select innovative technology solutions
- Collaborate with researchers and market performers
- Solve technical barriers and test innovations to prove effectiveness
- Measure and validate energy savings



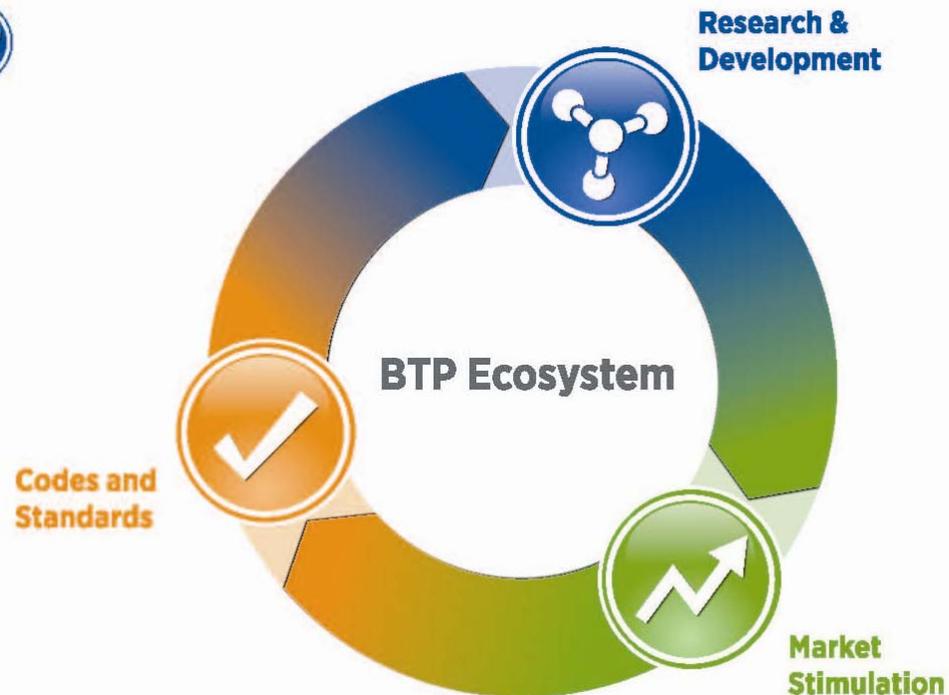
Market Stimulation

- Identify barriers to “speed and scale” adoption
- Collaborate with industry partners to improve market adoption
- Increase usage of products and services
- Work through policy, adoption, and financial barriers
- Communicate the importance and value of energy efficiency
- Provide technical assistance and training



Codes and Standards

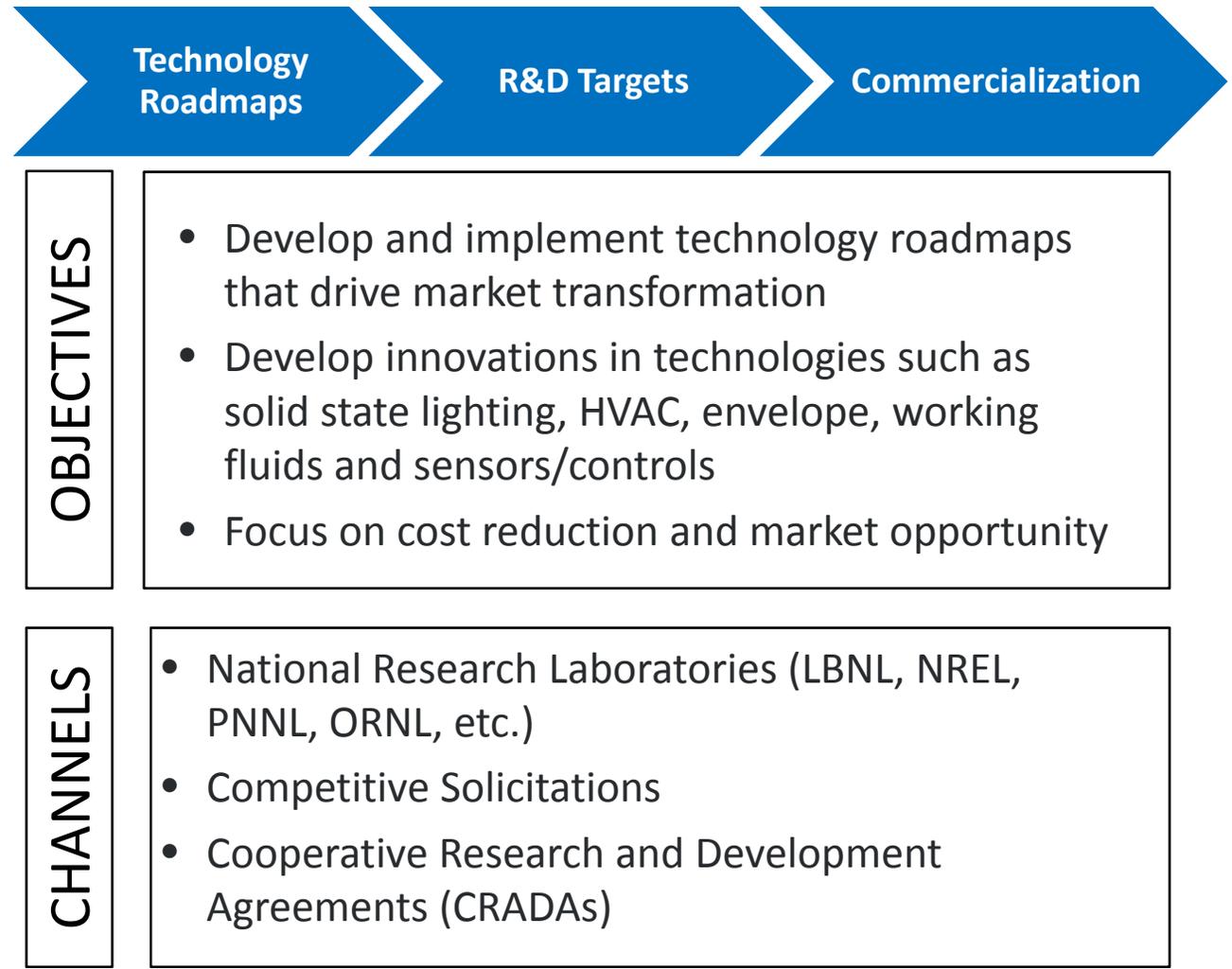
- Establish minimum energy use in a transparent public process
- Protect consumer interests
- Reduce market confusion
- Enhance industry competitiveness and profitability
- Expand portfolio of energy efficient appliances and equipment
- Raise the efficiency bar



Emerging Technologies- Creating the Next Generation of Energy Efficient Technology

“Innovation is what this country is all about. Sparking the imagination and creativity of our people, unleashing new discoveries – that’s what America does better than any other country on Earth. That’s what we do.”

President Obama
Winning the Future with Clean Energy
Penn State University February 3, 2011



Residential Multi-Function Fuel-Fired Heat Pump

Goal

Develop a residential gas engine-driven integrated heat pump

- Space conditioning, dehumidification, water heating, up to 3 kW of electrical energy
- Single family or multi family applications

- Builds on previous successful project for commercial rooftop AC application
 - 85% reduction in demand vs. electric HP
- CRADA project underway – prototype unit in lab testing phase
- Results could be support potential future fuel-driven heat pump work

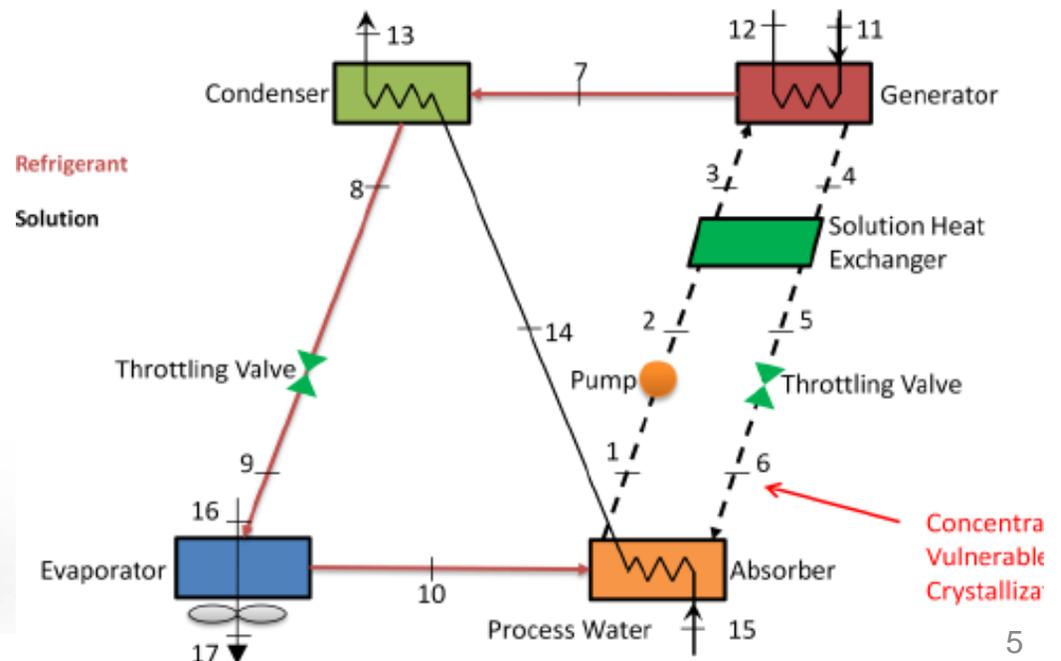


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Fuel Driven Heat Pump Water Heater

- **Fossil fuel to drive an absorption heat pump**

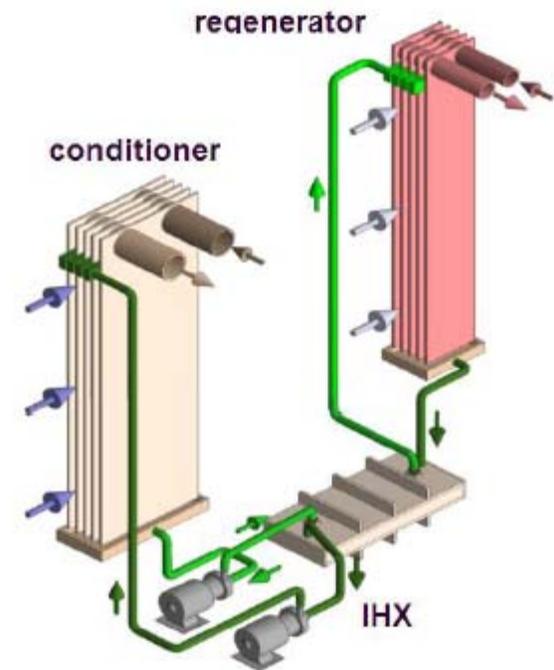
- Develop optimum working fluid (additives study)
- Develop best cycle configuration (patent applied)
- Demonstrate a working prototype and investigate commercialization potential
- Study additional thermally driven cycles (ejector)



Liquid Desiccant Air Conditioning (LDAC)

Description

- First, remove latent heat from incoming supply air using liquid desiccants
- Then, heat desiccant to remove moisture (full cycle)
- Effective in humid regions with small sensible heat loads
- Great option for fuel-fired A/C
- Can also be used as a supplemental system to reduce latent loads on A/C equipment
- Energy savings potential (US): 0.21 quads/year



Schematic of a liquid desiccant air conditioning system; water is absorbed in the conditioner, and the liquid desiccant is heated in the regenerator, driving off the excess water (Source: AIL Research)

Solar Water Heating

Description

- Solar water heating typically uses a gas (or electric) backup
- Can purchase solar “add-ons” to existing gas (or electric) system
- Competitive technology with conventional gas heating (electric heat pump water heaters tend to be better option if natural gas is not readily available)
- Next generation systems will exhibit improved solar heat absorption at significantly reduced costs



Figure 2: Flat-Plate Collector
(Photo courtesy of Rheem)



Figure 3: Evacuated Tube Collector
(Photo Credit: Alan Ford, NREL PIX 09501)

Conclusion

If you have any questions please contact :

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Thank You