

Emerging Technologies Program

The Value of Early Stage Research and Innovation in the Built Environment

Karma Sawyer, Ph.D., Program Manager, Emerging Technologies

April 30, 2018

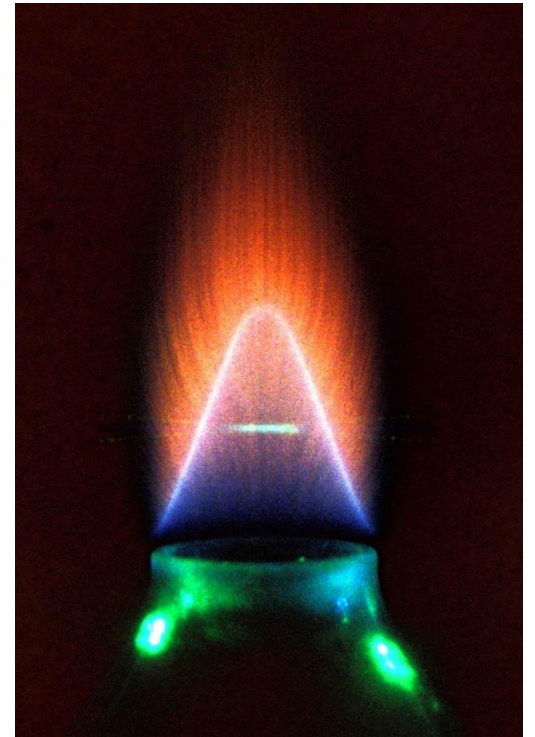
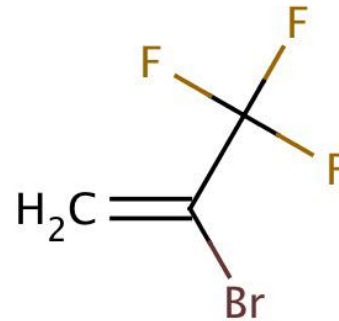
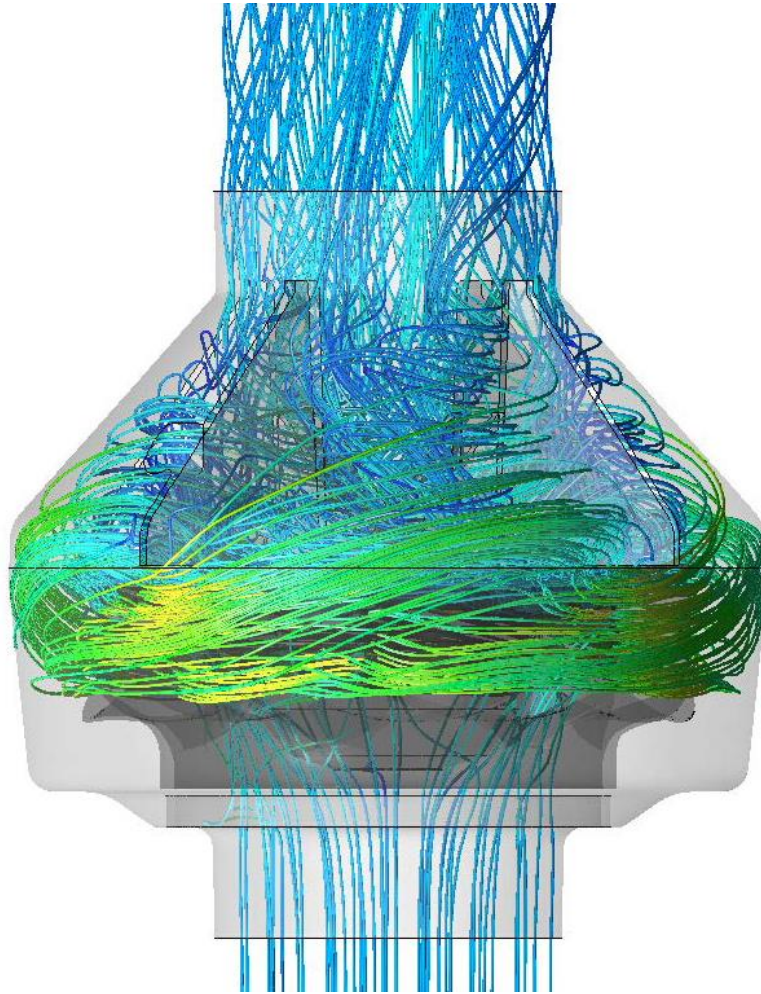




Building Energy Innovation

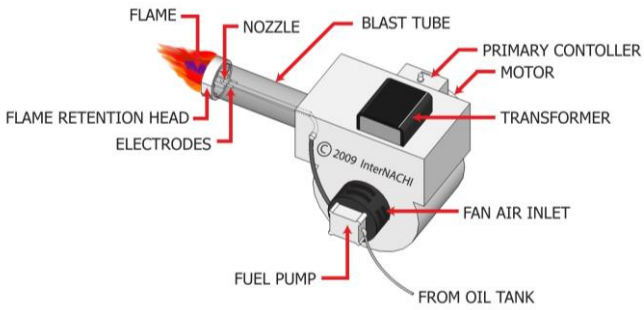


HVAC, Water Heating & Appliances



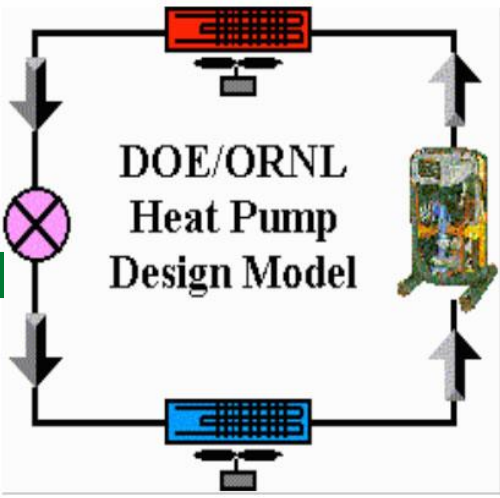
3rd party evaluation verifies energy savings

Flame-retention head oil burners

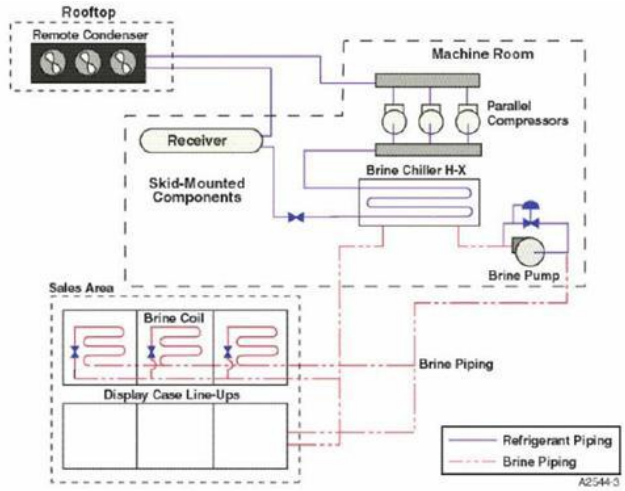


1980 Newspaper Ad for project Oilheat

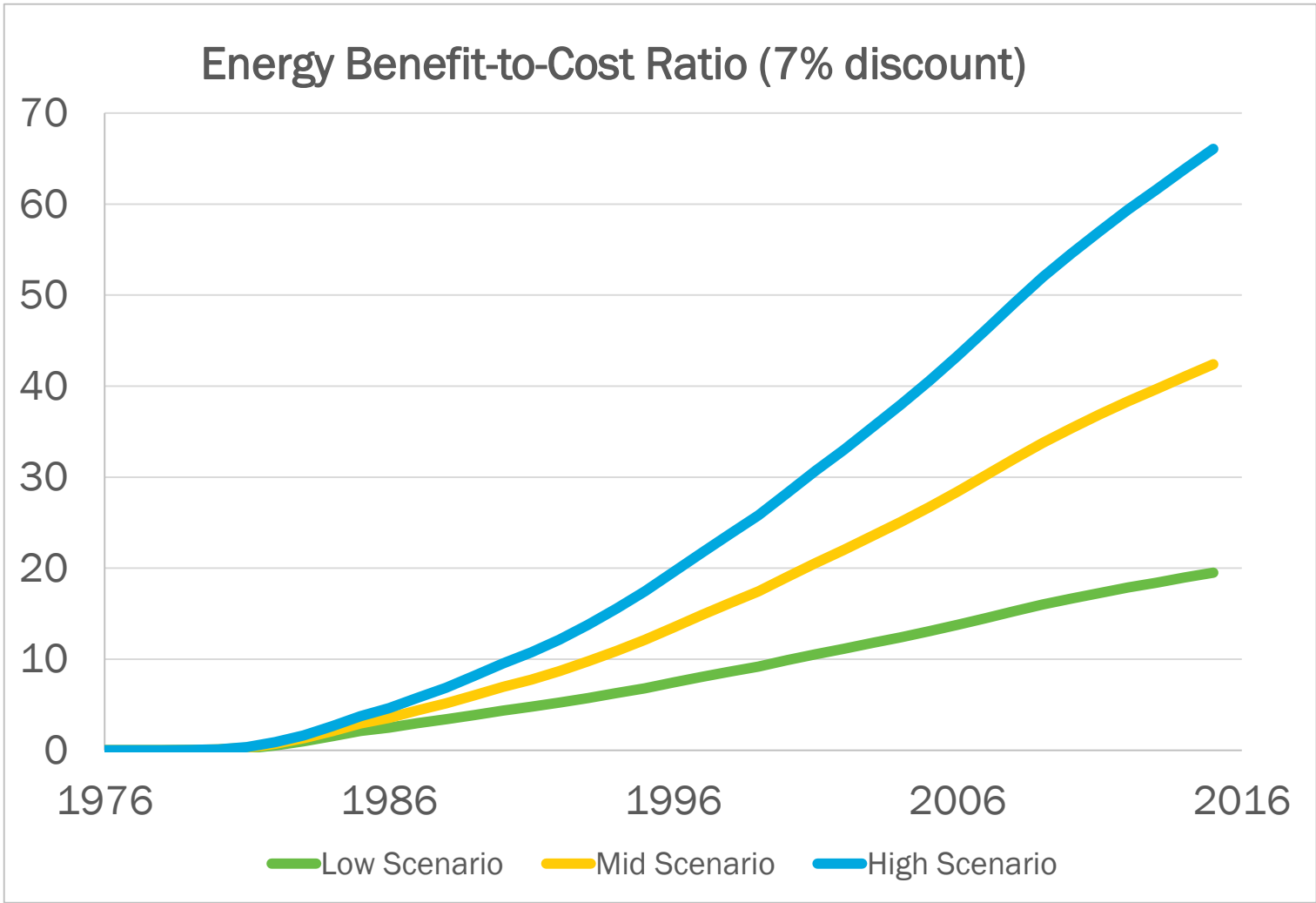
Heat Pump Design Model and Advanced Refrigerants



Advanced Refrigeration



Energy savings of \$20 to \$66 resulted from each \$1 invested by BTO



Emerging Technologies

Goal

By 2030, develop cost-effective technologies capable of reducing a building's energy use per square foot by **45%**, relative to 2010.

Strategy

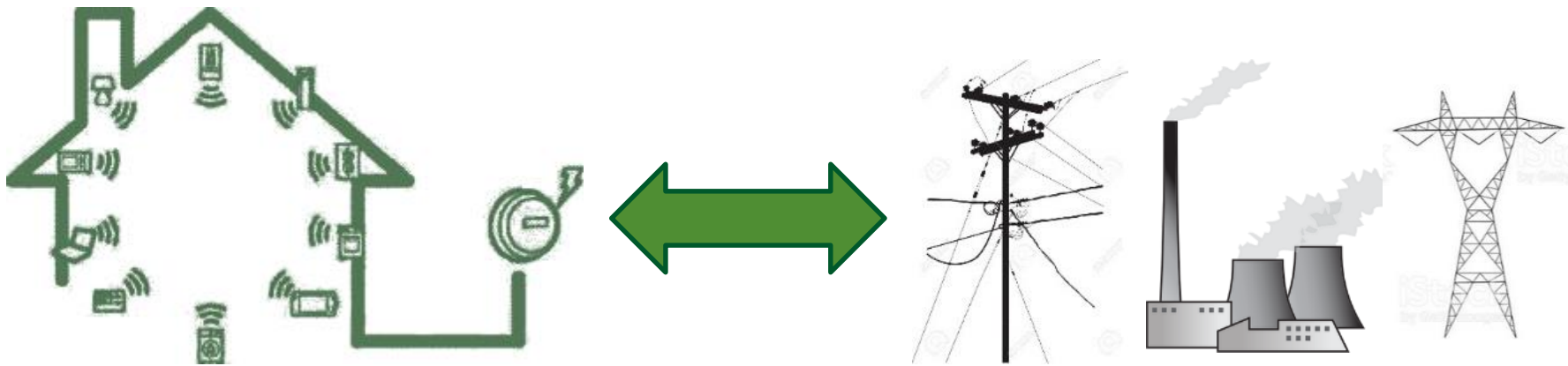
- Use **Scout** to analyze building energy efficiency technology potential impacts
- **Fund early-stage R&D** through competitive solicitations and National Lab technical capabilities
- Engage the **Grid Modernization Initiative** to address challenges related to the integration of conventional and renewable sources with energy storage and smart buildings as part of cyber-secure, modern electric grid

Technology Areas

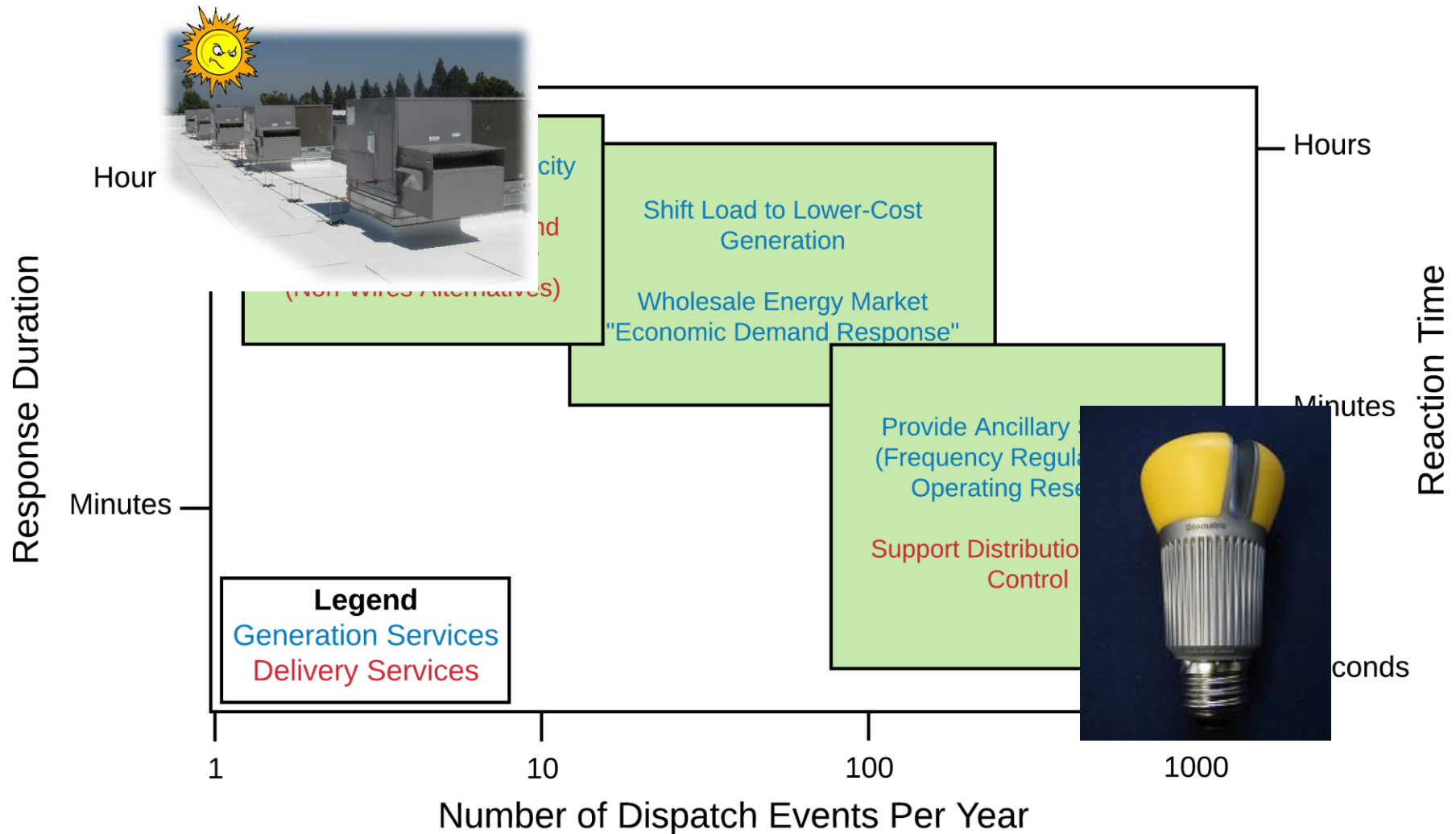


Grid-Interactive Efficient Buildings (GEB)

BTO is currently developing a new GEB strategy that will outline specific technical challenges and goals related to building-grid interaction.

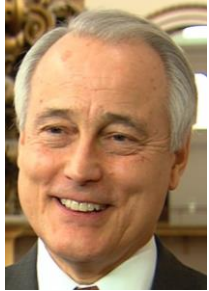


Different Grid Services Have Different Technical Requirements



Emerging Technologies Team

Technology Managers



Jim Brodrick
(Solid-State
Lighting)



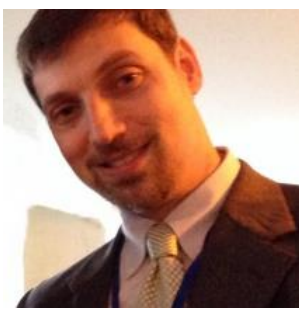
Tony Bouza
(HVAC/WH/
Appliances)



Marc LaFrance
(Windows &
International)



Marina Sofos
(Sensors &
Controls)



Amir Roth
(Building Energy
Modeling)



Sven Mumme
(Envelope and
System Integration)

Technology Tracks	Technology Manager	Rooms, Days and Times
HVAC	Tony Bouza	Washington Mon: 1:30-5:30 Tues: 10:45-5:30 Wed: 8:15-12:30
Sensors & Controls	Marina Sofos	Commonwealth Mon: 1:30-5:45 Tues: 10:45-6:00 Wed: 8:15-5:30
Transactive Energy Management	Sven Mumme	Jackson Tues: 10:40-5:00
Solid-State Lighting	Jim Brodrick	Jackson Wed: 8:00-5:00 Thurs: 8:15-10:45
Building Envelope	Sven Mumme	Washington Wed: 1:30-5:30
Building Energy Modeling	Amir Roth	Harrison and Wilson Thurs: 8:30-3:20

Dr. Saul Griffith – Founder & CEO of Otherlab

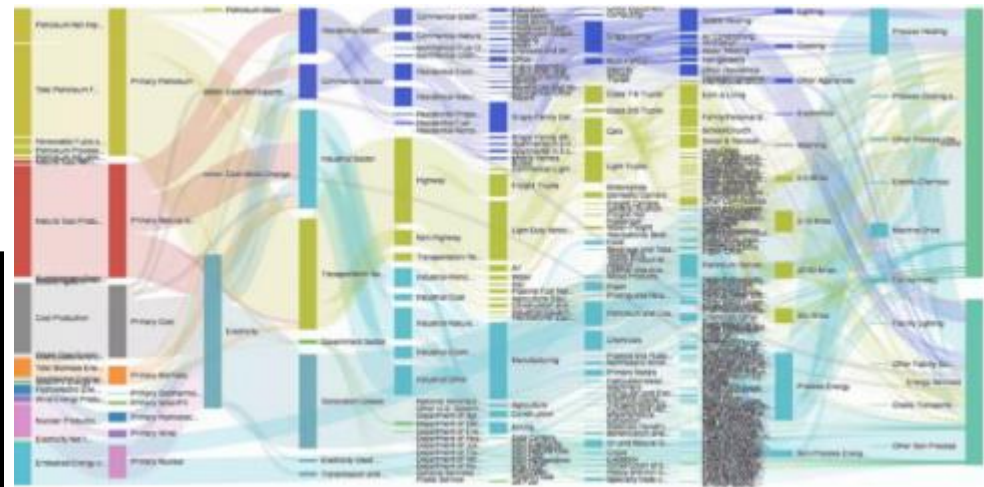
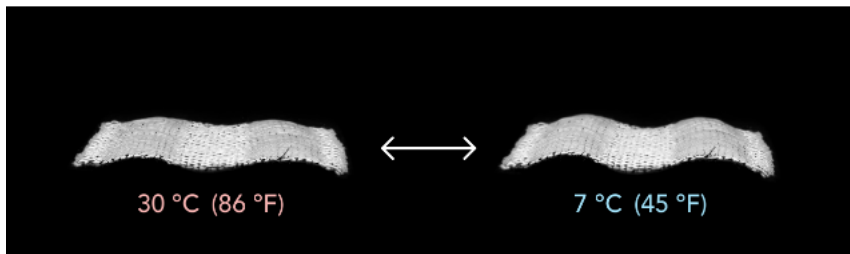


Photo credits: <http://www.saulgriffith.com/shortbio.html>, <https://otherlab.com/projects>,
<https://www.fastcompany.com/3062630/this-very-very-detailed-chart-shows-how-all-the-energy-in-the-us-is-used>

Karma Sawyer, Ph.D.

Program Manager, Emerging Technologies

DOE Building Technologies Office

karma.sawyer@ee.doe.gov