

U.S. DEPARTMENT OF
ENERGY

Office of
ENERGY EFFICIENCY &
RENEWABLE ENERGY

**BUILDING
TECHNOLOGIES
OFFICE**



**PEER
PREVIEW**

NOVEMBER 16 – 18, 2020





Dear BTO Family,

Welcome to the 2020 BTO Peer [PReview](#)! Although we cannot meet in person this year, we have plenty of opportunities to work on together.

Despite the changes the past year has brought, the Building Technologies Office (BTO) continues to work with our broad and deep network of research, industry and other partners to continually develop innovative, cost-effective energy-saving solutions – better products, new homes, ways to improve existing buildings, and better buildings in which to work, live, and lead our lives.

Since some 40% of U.S. energy and 75% of U.S. electricity is consumed in buildings – much of which is wasted – buildings must play an outsized role in addressing our nation's energy, economic, climate and infrastructure challenges. Building energy systems must progress on multiple fronts: optimizing power loads; providing utility services at-scale including balancing and integrating variable renewables; plugging in an ever-expanding constellation of electricity-hungry devices, appliances and electric vehicles; and providing enormous cost-effective reductions in carbon emissions...all while ensuring occupant productivity and comfort. These challenges can, and must, be met with an array of both new and familiar building technologies, materials, sensors & controls, design & construction techniques, operating practices, standards and more – supported by a better trained, diverse and inclusive workforce.

Together, we're working to meet the moment. Our [Advanced Building Construction](#) (ABC) initiative has launched dozens of projects in 2020. These represent our best attempt to modernize building construction with innovative technologies and practices that can provide efficiency with minimal onsite cost and disruption. Just last month, [Energy Secretary Brouillette announced \\$65 million](#) to expand our Connected Communities network of smart, grid-interactive efficient buildings (GEBs) five-fold. These communities will further demonstrate how groups of buildings, and the distributed energy resources to which they connect, can reliably and affordably optimize their energy performance – all while maintaining occupant comfort and reducing emissions. And you bet that we are delighted with the issuance of our largest [BENEFIT competitive funding opportunity](#) ever!

We have an exciting slate of discussions in store this week that will bring top experts together to address beneficial electrification, the rapid emergence of virtual home assessments, local government approaches to clean energy, and ideas to drive hard-tech innovation amid a soft-tech boom. We look forward to receiving diverse perspectives and input, to which we will listen attentively. As we probe these opportunities to better guide innovation in buildings, I hope you will share your successes and challenges from the past year with candor and open-mindedness – as well as your aspirations and advice for the coming years, as we enter a period of unprecedented and relentless change that demands our greatest ideas and energy.

Thank you for joining us at this [PReview](#), and welcome.

David Nemptzow, Director

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Exciting Activities in the Year Ahead

The world is evolving faster than ever, and the buildings sector is part of that transformation. To stay on top of industry developments, BTO is strategizing around cross-cutting activities that straddle the silos in which our programs are organized. This opportunity is exciting for many reasons, and BTO's leadership provides some insight into why we are looking forward to what the future holds for our work and the buildings industry in general.

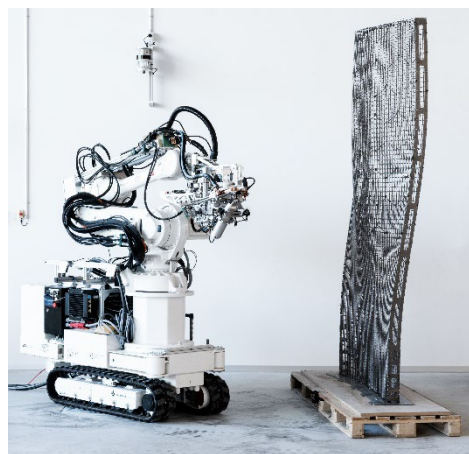
Not as Simple as “ABC” – Yet (David Nemtzw)

Throughout the three days of the 2020 BTO Peer *Preview*, you'll hear inspiring tales of innovation in technology, practices and programs. Too bad you're doing it from a home or office that most certainly was built deficient of innovative construction technologies and practices. The innovation revolution that has successfully disrupted so many American businesses – manufacturing, retail, autos and lighting to name a few – hasn't re-shaped how American homes and buildings are built and renovated. Well, at least not yet.

It's high time for ABC – the U.S. Department of Energy's (DOE) [Advanced Building Construction](#) initiative – to beg, borrow and steal innovative and highly efficient technologies from other fields and transplant them into construction. ABC is determined to integrate highly energy-efficient solutions for energy retrofits and new buildings into highly labor productive and affordable U.S. construction practices.

Let's take a quick tour through everything we in buildings have been missing:

- ✓ **Offsite, modular and panelized** construction in controlled factory settings can increase precision and scalability for greater energy performance with the integration of tighter envelopes, better installed windows, smarter controls and improved heating, ventilation and air conditioning (HVAC) design. Better yet, it can yield higher quality and faster construction timelines, improve productivity and lower costs.
- ✓ **New materials** such as sustainable insulation or engineered timber have the potential to decrease the overall energy used to construct buildings while simultaneously decreasing embodied and operational energy usage.
- ✓ **3D printing** is improving dramatically, opening doors for building structures and components that were previously impossible or incredibly time-consuming to create, including ones needed for highly efficient design.
- ✓ **Digitization** via complex software and faster computing allows for the rapid intake and processing of information. This means imaging, energy diagnostics, and other inputs to directly translate data into the fabrication of building components, including walls, roofs, or interior design features — it's never too late for “art-to-part”!
- ✓ **Robotics** allows workers to reach places or perform activities that were previously impossible. Robots can safely enter small spaces and cavities, such as ductwork, to perform air-sealing or other efficiency



ETH Zurich's robot, In Situ Fabricator, was used to build DFAB HOUSE in Switzerland, the world's first home designed, planned, and built using predominantly digital processes.

activities. Robots can ensure consistency and quality, and protect workers from harmful environments.

Just as some automakers optimized hybrid engines for acceleration rather than for fuel economy, there's no guarantee that construction innovations will be used to enhance the energy efficiency and carbon performance of buildings. But without these — and a few dozen Peer *PREviews*' worth of buildings innovation — we don't stand a chance of meeting the great affordability, productivity, energy and environmental challenges before us.

Progress is important and never comes easy, but to paraphrase Renée Zellweger's [line](#) in *Jerry Maguire*, "You had me at 'innovation'."

Trends and Opportunities in Electrification (Karma Sawyer)

Beneficial electrification has been a hot topic and a focus of many energy organizations for years, including utilities; state and local governments; regional, state, and local energy efficiency organizations; and manufacturers.

A key reason is that beneficial electrification — electrification combined with decarbonizing electricity generation — provides a strategy to meet the urgent climate crisis with existing technologies that improve energy efficiency. It also provides a useful framework for understanding the importance of integrating technologies, especially grid-interactive efficient buildings, across the entire energy sector, from generation to electricity infrastructure and end uses. In this future vision for the nation, solar and wind will do the heavy lifting, and electrification will continue to ramp up so that we use far more electricity. The details of these evolving energy trends will vary nationwide, but there will be big changes in how we transmit, store and use electricity. Increasingly, both the public and private sectors will look to BTO as a neutral, data-driven entity that can guide our entire country through a big transition.



Heat pumps heat and cool buildings in much the same way your refrigerator chills food. When properly installed, air-source heat pumps like this one can deliver one-and-a-half to three times more heat energy to a home than the electrical energy it consumes.

On the surface, the message seems to pack a resounding win-win-win punch. Beneficial electrification (1) can reduce consumer expenses; (2) benefits the environment and reduces greenhouse gas emissions; and (3) supports a resilient electrical grid. But there are important counterfactuals for each of these elements: (1) upfront equipment upgrades are costly, with significant equity concerns; (2) environmental benefits are achieved only if the electricity generation is indeed cleaner; and (3) new peaks on the electrical grid and the associated reliability are concerning. And the debate can go on. However, if reducing carbon emissions is a key objective for a utility, state, local government, or organization, then beneficial electrification is an issue that must be considered as part of the solution for the built environment.

Although not the norm today, energy efficiency programs can expand to support electrification measures, better providing for utility and consumer needs in the future. In fact, many of the barriers to electrification are those that we also face with energy efficiency. This is a need for more consumer education, infrequent stock turnover of 15–20 years, improved results with ducting and envelope upgrades, reduction in the high upfront costs, more training required for installation, and changes with regulation on numerous fronts.

As a community of researchers pursuing technological improvements for the built environment, BTO must understand how best to leverage precious research and analytical funding to support many different stakeholders. If a combination of technologies—such as smart, controllable heat pumps and simple envelope upgrades — can result in a knockout punch, we should use our funding to strengthen that punch. It supports energy reduction, controllable loads, and fewer direct-fuel emissions from buildings.

Join us on November 18 during the BTO Peer *PR*ewiew to hear from a panel of leaders across the nation who are actively working to understand how to bring beneficial electrification to both residential and commercial buildings. If you have feedback on how BTO's research can pack a knockout punch, let us know in the stakeholder breakout session by registering [here](#).

Come As You Are (Amy Jiron)

You matter. Yes, unique and beautiful you with your individual perspective, experiences and background. You matter to BTO, and we stand in solidarity with you.

We invite you to join us in answering a colossal challenge. A challenge that comes with an imperative opportunity. We cannot fail, and we won't fail if we work together, stand together, and include each other to cultivate the best ideas...TOGETHER. There is a role and a need for every human. So, I say, join us! Me: Amy, half-Chicana, she/her/hers, public servant, mom, passionate about buildings. Come just the way you are because we, BTO, more than 60 strong, are the conveners of a community that emphasizes partnerships and collaboration; learning, listening and celebrating the diverse voices of many; joining together to create an inclusive and equitable solution. Come along with us, because you matter, we need you, and we will not give up. Let's do this!

Welcome.



Local Governments: A Critical Partner in Getting to Low-Carbon Buildings (Joan Glickman)

My first job after grad school was working as a project manager for the International City/County Management Association. With little understanding of local government functions, I was tasked with helping city and county managers address liability under [Superfund](#) and contend with growing numbers of parcels tainted as “brownfields.” It was a crash course, with mostly white middle-aged men telling me that Superfund was misguided, and federal unfunded mandates were getting in the way of their addressing more pressing community needs.

Having just finished my master's degree in public policy, I believed in the virtue of laws that "internalized externalities"...yet I was torn by what I saw and heard. On the one hand, these local leaders made some valid points: While Superfund had resulted in a number of toxic waste cleanups and served as a deterrent to future mishandling of waste, it was also very flawed. And, Superfund was one of many laws where local governments were tasked with carrying out costly compliance measures without sufficient funds. On the other hand, many of these federal mandates were delivering widespread public benefits – reducing pollution, serving the needs of individuals with disabilities, and protecting workers' health and safety, to name a few.

That was almost 30 years ago (YIKES!). Since then, the tables have turned with many local governments voluntarily committing to new mandates that the federal government has been unable or unwilling to support – carbon caps, minimum wage, renewable portfolio standards, health policies (e.g., masks), and more.



So, why are local governments well-positioned to address some large societal struggles? First, local governments have a wide range of tools at their disposal, ranging from financial tools (e.g., bonds, taxes, incentives) to public information campaigns and codes. Second, as the leaders and institutions that individuals and businesses call on first to address their concerns, local governments generally have their hands on the pulse of their constituents and understand how far and how quickly they can advance new policies. Finally, given their proximity to the "action", they can also be in a better position to predict how policies will play out in implementation.

While climate is a global challenge, local governments will likely play an increasingly important role with growing numbers feeling the impacts of *not* addressing climate change. In a national survey conducted by the U.S. Conference of Mayors ([C2ES 2020](#)), 96% of respondents reported experiencing at least one climate impact in the past five years, most commonly citing heavy rains or inland flooding (80%), heat waves (62%), and drought (48%). Local governments can lead by example with efficient municipal buildings and procurement of green products and services, adopting more efficient codes and training inspectors, requiring building ratings and more.

Moving forward, partnerships between BTO and local governments are key to our mutual success. BTO is well-positioned to provide expert tools, information, and national leadership (e.g., through [Home Energy Score](#), best practices, procurement challenges, and the [ABC Collaborative](#)) to ensure that local action is as effective as possible. And, given the myriad challenges facing their communities, local governments can provide practical guidance and drive us to low-carbon solutions that hold broad appeal and potentially tackle other local priorities such as disaster resilience, jobs, and/or public health.

The Importance of Field Validation in DOE's Test Procedures (John Cymbalsky)

DOE's [Appliance and Equipment Standards Program](#) develops and updates test procedures to ensure they remain technologically relevant and provide manufacturers with a level playing field and a platform to bring new product innovations to market. For consumers, the program's periodic review of test procedures lays the foundation for reliable and comparable operating cost information for the

most common household and business appliances. To achieve these goals, DOE's test procedures must manage a balancing act between repeatability/reproducibility, burden, and representativeness of field energy efficiency or energy use.

Variability in field usage of appliances and equipment across building types, climate zones, and household or business characteristics can be significant. However, trying to capture all possible variations within a test procedure would create undue burden in terms of time and cost. Therefore, DOE's test procedures often include representative loads, temperatures, and/or modes of operation, designed to be generally representative of typical field use while correctly rank-ordering products in terms of energy use or energy efficiency. In other words, while a consumer will not experience the exact same energy use provided on a Federal Trade Commission Energy Guide label, a consumer can be confident that when choosing between two models with different energy use ratings, the one rated with lower energy use will also achieve lower energy use in their home.

Field validation studies help DOE assess whether test procedures meet these goals. For example, DOE's refrigerator test procedure does not include door openings, but instead uses a higher ambient temperature to account for additional losses that occur with door openings. A review of field studies demonstrated that this approximation adequately reflects energy use in the field.

More recent product innovations in terms of advanced technologies such as variable speed compressors and sophisticated controls have made the balancing act of test procedures more difficult. Recent field studies on variable refrigerant flow (VRF) equipment demonstrated that in the field, VRFs operate quite differently from expectations based on the test procedure. Not only might the ratings be unrepresentative of typical use, but the rank-order of models by efficiency may not be accurate. This is because the test procedure captures performance at fixed speeds and therefore does not capture the nuances of how individual manufacturer control schemes operate in the field.



Variable refrigerant flow (VRF) units serve the space conditioning needs of large office buildings.

As part of an [Appliance Standards Rulemaking and Advisory Council](#) (ASRAC) Working Group, DOE worked with stakeholders across industry, utilities and efficiency advocates to conduct a significant testing program to identify an alternative test procedure that would more accurately represent controls operation in the field. The result? A Controls Verification Procedure (CVP) that will be incorporated into the industry test standard.

DOE and key industry stakeholders continue to conduct field validation studies on products such as cold climate heat pumps to help understand field operation and to consider how test procedure updates might better capture performance of advanced technologies. Simultaneously, experimental laboratory testing is conducted to continuously improve the ability for more realistic, representative load-based testing to be repeatable, reproducible, and not unduly burdensome.

With every product innovation, the balancing act continues.

Mission

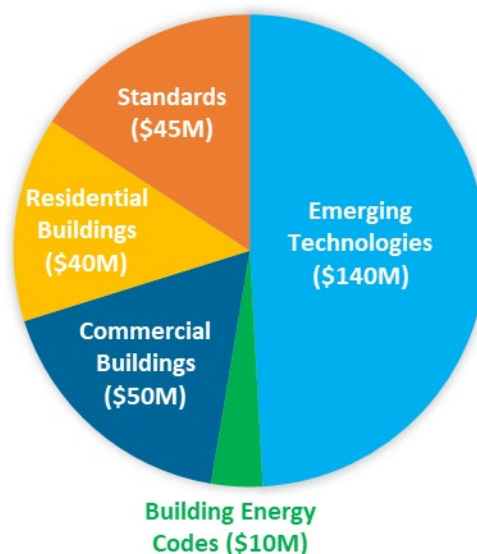
BTO's mission is to develop, demonstrate and accelerate the adoption of cost-effective technologies, techniques, tools and services that enable high-performing, energy-efficient and demand-flexible residential and commercial buildings in both the new and existing buildings markets.

BTO's long-term goal is to achieve a 30% reduction in energy use intensity (EUI) of homes and commercial buildings from 2010 levels by 2030. By meeting this goal, BTO envisions buildings that can cost-effectively shift or shed significant shares of typical electricity consumption without reduction in service. Furthermore, grid-interactive efficient building (GEB) technologies will be commonplace in new construction.

Budget

BTO's total fiscal year (FY) 2020 budget is \$285 million across all programs. As shown in the chart at right, this budget is allocated across all five BTO programs. Last year's budget focuses on early-stage research and development (R&D), systems integration and validation, and statutory requirements. Heading into the 2021 fiscal year, BTO has a few highlighted activities that include the Energy Storage Grand Challenge, grid integration, a cybersecurity crosscut for sensors and controls R&D, and the Buildings Integration Challenge.

The [Energy Storage Grand Challenge](#) is a DOE-wide initiative, with BTO's contribution closely related to its GEB activities of early-stage R&D in thermal energy storage and controllable building loads to enhance grid reliability. Grid integration focuses on BTO's GEB efforts to conduct R&D that then improves industry efforts to develop and deploy GEBs capable of connecting with the power grid in new ways. The cybersecurity crosscut targets early-stage R&D of secure and resilient sensors and control systems for advanced technologies. The Buildings Integration Challenge is a challenge designed to seed industry investment in energy-efficient, flexible, and interoperable envelope products and HVAC sensors and controls for both commercial and residential buildings integration.



The pie chart depicts the BTO FY 2020 budget breakdown by program area.

Programs

To achieve its mission, BTO supports innovative R&D, technology validation, tools and information development, information sharing, and utilization of regulatory authority. BTO investments in these activities, through coordination and engagement with industry and other key stakeholders, deliver

novel solutions that can improve the efficiency and reduce the energy costs of the nation's homes, offices, schools, hospitals, and other commercial and residential buildings. In addition to saving energy, BTO technologies and activities are helping to improve energy affordability, increase the integration of energy technologies and systems into commercial and residential buildings, and expand the available suite of cost-effective options for energy storage. To achieve its energy efficiency goals and improve energy affordability for homeowners and building owners and operators, BTO's activities are organized under five program areas:

- Emerging Technologies,
- Residential Buildings Integration,
- Commercial Buildings Integration,
- Building Energy Codes, and
- Appliance and Equipment Standards.

BTO also has initiatives that span multiple programs, including [GEB](#) and [ABC](#). As part of GEB, the Connected Communities FOA just announced up to \$65 million to expand DOE's network of GEB communities nationwide. The ABC Initiative's \$26.3 million investment into its 40 projects began in earnest this year, capped off by the launch of the [ABC Collaborative](#) in July.

Emerging Technologies

[Emerging Technologies \(ET\)](#) supports research, development and commercialization of high-impact building technologies with substantial potential to cost-effectively reduce primary energy consumption and peak loads and to increase demand flexibility and the ability of buildings to provide grid services via efficiency, shedding, shifting and modulating.

Emerging Technologies research includes energy storage, controllable loads, and semiconductor physics for lighting.

Our 2020 BENEFIT FOA provides up to \$80 million to address building technology research, development, and field validation and advanced building construction. Applications are due January 20, 2021.

Residential Buildings Integration

[Residential Buildings Integration \(RBI\)](#) spurs greater energy efficiency in existing and new residential buildings through R&D and field validation of technologies; development and dissemination of best practices and tools; and partnerships with public and private sector stakeholders aimed at simultaneously improving efficiency, affordability, and comfort.

RBI research in FY2021 will support two challenges aligned with the ABC initiative:

- **Energy Storage Grand Challenge**, focusing on advancing storage in water heating and the envelope
- **Buildings Integration Challenge**, focusing on one or more specific ABC technologies and practices.

Commercial Buildings Integration

[Commercial Buildings Integration \(CBI\)](#) helps improve existing and new commercial buildings by demonstrating cost-effective technologies that enhance building energy performance and operations, partnering with market leaders to increase technology adoption, and providing design and management tools and performance data to reduce perceived risks and address market barriers that have inhibited wide-scale uptake.

CBI will launch its **Buildings Integration Challenge** at DOE's Better Buildings Summit in FY2021. The Challenge is designed to foster industry investment in energy-efficient, flexible, and inter-operable technologies for improved buildings integration,

Building Energy Codes

[Building Energy Codes \(BEC\)](#) supports the evaluation, development, and implementation of commercial and residential building energy codes. BEC provides technical analyses to support regular updates of model building energy codes, as well as technical assistance and reports on the value of more advanced building energy codes to support states and municipalities through adoption. BEC will remain in compliance with statute by providing this work toward building codes.

BEC is now hosting the weekly National Energy Codes Conference (NECC) Seminar Series, begun in Fall 2020. The annual NECC conference has been tentatively rescheduled for May 11-13, 2021, in Chicago. Hope to see you there!

Appliance and Equipment Standards

[Appliance and Equipment Standards](#) develops and regularly updates energy conservation standards for appliances and equipment, ensures the availability of reliable and effective test procedures, and enforces standards and labeling through product testing and compliance efforts.

Appliance and Equipment Standards will continue to meet statutory obligations for test procedures through regulating the energy or water use of labor-saving products that ultimately account for most of the energy used in buildings.

Event Schedule

Monday, November 16, 2020

Time	Session	Session Description
11:00 – 11:15 am	Message from DOE and BTO Leadership	
11:15 am – 12:45 pm	Virtually as Good as the Real Thing – Remote Inspections	There are many rapidly emerging solutions that remote/virtual inspections and ratings can provide, but what is their post-pandemic fate? Will remote inspections complement and enhance in-person inspections in the future – or replace them altogether?
12:45 – 1:15 pm	Remarks from Daniel R Simmons, Assistant Secretary for the Office of Energy Efficiency and Renewable Energy	
1:15 – 2:45 pm	The Loads They are a-Changin’	As end-use building technologies, consumer preferences, and state and local policies evolve, how should the BTO community respond to beneficial electrification and changing building energy loads?
2:45 – 3:15 pm	The Loads They Are a-Changin’ Breakouts	Join a small group discussion focused on feedback to the Buildings Technologies Office on research needs related to beneficial electrification.

Tuesday, November 17, 2020

Time	Session	Session Description
11:00 – 11:30 am	Remarks from BTO Director David Nemetzow	
11:30 am – 1:00 pm	Hardware is Hard – How do we commercialize ‘hard tech’ building innovations faster?	What are the latest and greatest practices for innovation in the hard-tech space? Hear from startups, investors, and entrepreneurs about how hard-tech researchers can prepare for customer discovery and find product-market fits that cross the “valley of death” and succeed.
1:00 – 1:15 pm	Break	

1:15 – 2:45 pm	IMPEL Your Innovation!	Hear IMPEL+ participants pitch their innovations in a “Shark Tank”-style panel of entrepreneurs, potential funders and other experts. See what advice the experts give them and provide your own!
2:45 – 3:00 pm	Break	
3:00 – 4:00 pm	Better Know the BTO – A Quiz Show	How much do you know about the BTO and building energy use? Join us Tuesday for a quiz show to test your knowledge and interact with your peers. End the second day of the Peer <i>Pre</i> view with a special social session complete with guest appearances.

Wednesday, November 18, 2020

Time	Session	Session Description
11:30 am – 1:00 pm	Leading Local – Clean Energy Approaches	Local government leaders across the country are designing and deploying programs to meet clean energy and environmental goals. Learn how – and where – clean energy programs are going, what challenges they’ve encountered, and those they’ve overcome.
1:00 – 1:15 pm	Break	
1:15 – 2:45 pm	From Intention to Action: Diversity, Equity and Inclusion in Building Efficiency	Concrete examples of actions the clean energy field is taking to increase diversity, equity and inclusion (DEI). Panelists will describe the outcomes of their organizations actions and then share your perspectives in facilitated breakout sessions.

List of Speakers

Monday, November 16

Virtually as Good as the Real Thing – Remote Inspections

- Steve Byers – CEO, EnergyLogic
- Jason Elton – Senior Consultant, Earth Advantages
- Valarie Evans – Building Official, City of Las Vegas
- Jessica Granderson – Staff Scientist and Deputy of Research Programs for the Building Technology and Urban Systems Division, Lawrence Berkeley National Laboratory
- Jack Mayernik – Senior Energy Analyst, National Renewable Energy Laboratory

Remarks from DOE Leadership

- Daniel Simmons, Assistant Secretary for the Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy

The Loads They Are a-Changin’

- Donovan Gordon – Director of Clean Heating and Cooling, New York State Energy Research and Development Authority
- Saul Griffith – Founder and Chief Scientist, Otherlab
- Rachel Huang – Director, Energy Strategy, Research and Development, Sacramento Municipal Utility District
- Avni Jamdar – Director, Emerald Cities Collaborative, San Francisco Bay Area
- Alejandra Mejia – Building Decarbonization Advocate, Climate and Clean Energy Program, National Resources Defense Council
- Maggie Molina – Branch Chief, State and Local Energy and Environment Program, U.S. Environmental Protection Agency

Tuesday, November 17

Remarks from DOE Leadership

- David Nemtzw, Building Technologies Office Director, U.S. Department of Energy

Remarks from DOE Leadership

- Alex Fitzsimmons, Deputy Assistant Secretary for Energy Efficiency, Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy

Hardware is Hard: How do we commercialize "hard tech" building innovations faster?

- Kipp Bradford – CTO, Treau, Inc.
- Ilan Gur – CEO, Activate
- Ramsay Huntley – Sustainable Finance Strategist, Wells Fargo
- Alexandria Lafci – Co-Founder and COO, New Story

- Edmund Pendleton – Lead Instructor, Regional Mid-Atlantic I-Corps Program, University of Maryland
- Katie Rae – CEO and Managing Partner, The Engine

IMPEL Your Innovation!

- Karma Sawyer, PhD – Program Manager, Emerging Technologies, Building Technologies Office, U.S. Department of Energy
- Kipp Bradford – CTO, Treau, Inc.
- Luis Fernandes, PhD – Principal Scientific Engineering Associate, Lawrence Berkeley National Laboratory
- Erin Keys – Director of Sustainability, Austin Technology Incubator
- Mary Hubbard – Building Technologies Office, U.S. Department of Energy
- Alexandria Lafci – Co-Founder and COO, New Story
- Steve Norwood – President, Norwood Architecture, Inc.
- Reshma Singh – Program Director, Lawrence Berkeley National Laboratory
- Wale Odukomaiya, PhD – Research Engineer, National Renewable Energy Laboratory
- Erik Page – CEO, Blue Iris Labs, Inc.
- Elise Strobach, PhD – CEO, AeroShield

Wednesday, November 18

Leading Local – Clean Energy Approaches

- Harry Bergmann – Building Technologies Office, U.S. Department of Energy
- Brian Blackmon – Director, City of Knoxville Office of Sustainability
- Mark Chambers – Director of Sustainability, New York City
- Andrea Durbin – Executive Director, Oregon Environmental Council
- Patricia Gomez – Resilience/Energy Program Manager, Miami-Dade County Office of Resilience
- Johanna Partin – Director, Carbon Neutral Cities Alliance
- Erick Shambarger – Director of Environmental Sustainability, City of Milwaukee
- Edward Yim – Energy Policy Advisor, District of Columbia Department of Energy and Environment

From Intention to Action: Diversity, Equity and Inclusion in Building Efficiency

- Holly Carr – Solar Decathlon Acting Director, U.S. Department of Energy
- Roderick Jackson, PhD – Laboratory Program Manager, Building Technologies Research and Development, National Renewable Energy Laboratory
- Mandy Mahoney – President, Southeast Energy Efficiency Alliance
- Terrence Mosley – American Association for the Advancement of Science, Science and Technology Policy Fellow, U.S. Department of Energy
- Chun Yee Yip – Director of External Partnerships, Lendlease

Leadership Bios



David Nemtzow

Director

David Nemtzow brings over three decades of leadership experience in energy, including in industry, government, utility, and associations to BTO. As Director of BTO, David leads our \$285 million per year office that helps develop innovative, cost-effective energy efficiency and demand flexibility R&D, market-facing products, standards, and other solutions for U.S. building technologies, equipment, systems and whole buildings. Previously, he was Director-General (CEO) of the Department of Energy, Utilities, and Sustainability for New South Wales, Australia; Chief Policy Officer of Ice Energy, Inc.; and served as President of the Alliance to Save Energy. David earned a master's degree from Harvard University in public policy and a bachelor's from Brown University in environmental policy.



John Cymbalsky

Program Manager, Appliance and Equipment Standards

John Cymbalsky is the Appliance and Equipment Standards Program Manager at the Building Technologies Office. John leads a team responsible for developing federal energy conservation standards and test procedures as well as providing technical support to the development of ENERGY STAR product test procedures and verification testing. Prior to taking this position in 2010, John worked at the Energy Information Administration for over 20 years where he was responsible for the development of the National Energy Modeling System's (NEMS) Residential Energy Demand Module. John holds a bachelor's degree, Cum Laude, in Economics and Statistics from the University of Buffalo and completed graduate work in Economics at George Mason University.



Joan Glickman

Program Manager (Acting), Residential Buildings Integration

Joan Glickman currently serves as the Acting Program Manager for the Residential Buildings Integration Program. Prior to that, she managed the U.S. Department of Energy's Home Energy Score and Home Energy Information Accelerator. Joan joined the Department's Office of Energy Efficiency and Renewable Energy in 1997 and has held a variety of positions there including Deputy Director of the Federal Energy Management Program. Joan has a master's degree in

public policy from Harvard's John F. Kennedy School of Government and a bachelor's in history from Amherst College.



Amy Jiron

Team Lead, Program Manager (Acting), Commercial Buildings Integration

Amy Jiron currently serves as the Acting Commercial Buildings Integration Program Manager where she leads the development and execution of a transparent, interdisciplinary framework to streamline and accelerate the voluntary development and adoption of cost-effective energy efficient commercial building solutions. Prior to joining BTO, Amy served as the Executive Director of the U.S. Green Building Council Colorado Chapter and worked as an engineer with an energy consulting firm and at an energy services company. Amy received her Juris Doctor from the American University-Washington College of Law and earned a bachelor's in architectural engineering from the University of Colorado in Boulder.



Karma Sawyer

Program Manager, Emerging Technologies

Dr. Karma Sawyer is the Program Manager for the Emerging Technologies (ET) program with the Department of Energy's Building Technologies Office. Karma oversees a diverse portfolio of research and development program areas, with the goal of developing cost-effective, energy-efficient high-impact building technologies. Karma joined the ET team at BTO in 2013 as the technology manager for the Windows and Envelope subprogram, later taking the additional role as the Technology Analysis and Commercialization manager. Prior to joining BTO, Karma served as an Assistant Program Director at the Department's Advanced Research Projects Agency-Energy (ARPA-E). Karma earned her PhD in physical chemistry at the University of California, Berkeley and received a bachelor's in chemistry from Syracuse University.

BTO Staff

David Nemtzow – Director

Emerging Technologies

Karma Sawyer – Program Manager
Fredericka Brown (Fellow)
Erika Gupta
Mary Hubbard
Mohammed Khan
Marc LaFrance
Wyatt Merrill (Fellow)

Sven Mumme
Monica Neukomm
Joshua New (M&O)
Radhakrishnan Nikitha (M&O)
Sam Petty (Fellow)
Amir Roth
Brian Walker

Residential Buildings Integration

Joan Glickman – Program Manager
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Steve Dunn
Chris Early
Lyla Fadali (Fellow)
Adam Hasz

Dale Hoffmeyer
Marc LaFrance
Terrence Mosley (Fellow)
Sam Rashkin
Nicholas Ryan (Fellow)
Maddy Salzman
Eric Werling

Commercial Buildings Integration

Amy Jiron – Program Manager
Harry Bergmann
Cedar Blazek
Mariana Egea Casaldue (Fellow)
Hannah Debelius (Fellow)
Blake Dressel (Fellow)

Ryan Fedie
Kassandra Grimes (Fellow)
Charles Llenza
Carl Shapiro (Fellow)
Sarah Zaleski

Building Energy Codes

David Nemtzow – Program Manager
Michael Reiner (Fellow)

Jeremy Williams

Appliance and Equipment Standards

John Cymbalsky – Program Manager
Bryan Berringer
Lucy deButts

Jeremy Dommu
Stephanie Johnson
Catherine Rivest

Operations

Bob Aasen
Lucy deButts
Jeremiah Freeman

John Mayernik
Regina Washington

Support Staff and Contractors

BTO relies on a strong network of contractors, including the following and many others:

Seghen (Mike) Atsbaha
Mia Casabona
Rebecca Ciraulo
Naeema Conway
Paget Donnelly
Julia Downing
Randall Gentry
Starlette Gibbs
Karen Harting
Gretchen Hitchner

Alexandra Isaacson
Patty Kappaz
Kristian Kiuru
Andy Kobusch
Jared Langevin
Marissa Morgan
Don Mosteller
Zoe Respondek
Bill Zwack

JOIN OUR TEAM

The Building Technologies Office leads a vast network of research and industry partners in developing innovative, environmentally friendly, and energy-saving solutions to our nation's energy, economic and environmental challenges.

BTO currently seeks to fill two Scientific, Technical, Engineering and Mathematics (STEM) positions at the GS-13 and GS-14 levels – and likely more in the near future.

- [General Engineers](#)
- [Physical Scientists](#)

These positions will be filled using an **expedited hiring process** available through BTO's Direct Hire Authority. This process adheres to the Merit System Principles and all Federal and DOE regulations. BTO values and benefits from our diversity.

Please help us spread the word!

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BUILDING TECHNOLOGIES OFFICE



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RENEWABLE ENERGY**