

ENERGY EFFICIENCY IDEA GUIDE

FOR ARIZONA



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ABOUT THIS GUIDE

At \$0.039/kWh, energy efficiency is a very low-cost source of energy for utilities nationally.¹ As an industry, energy efficiency creates jobs that are primarily local and cannot be outsourced. Additionally, it reduces cash outflow from the economy by reducing fuel imports while making locally-produced goods and services more competitive in the global marketplace. However, many technological, economic and social barriers limit mining of energy efficiency's true potential internationally, in the United States, and in Arizona.

The goal of this Energy Efficiency Idea Guide is to provide policymakers and stakeholders a quick-read of forty-six ideas for potential policies, programs and initiatives that can increase the adoption of energy efficiency in the built environment in Arizona. It is intended to spark the beginning of conversations between stakeholders, not to be the definitive resource with all the answers set in stone. It is being updated online and supplemented with more in-depth briefs covering some of the challenges and solutions to the complexities that inevitably arise in taking an idea through to implementation.

Visit energize.asu.edu > Policy Options for more information, including a dynamic, searchable database of the ideas, as well as research briefs and links to additional resources.

¹ Source: ASU Global Institute of Sustainability analysis of data from the U.S. Energy Information Administration, Form EIA-861, "Annual Electric Power Industry Report" (2002 – 2011).

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IDEA 01

REMOVE THE DISINCENTIVE OF LOST REVENUE

The Arizona Corporation Commission adopts full rate decoupling or loss recovery mechanisms for all Arizona utilities under their jurisdiction.

Purpose

As long as utilities make profits by selling more energy, there will always be disincentives to utilities promoting energy efficiency. Utilities are key enablers of energy efficiency, and alignment of business models will bring them fully on board.

Key Enablers

Arizona Corporation Commission

Key Stakeholders

Utilities, SWEEP, RUCO, AARP, AZ Community Action Association, AZ for Electric Choice & Competition, AZ Interfaith Power & Light, AZ PIRG, Sierra Club, EE manufacturers, EE implementers

Challenges

AARP is opposed to full decoupling because it views it as a transfer of risk from the utility to consumers. ACC staff has concerns as well.

References and More Information

energize.asu.edu > Policy Options > Idea #01

IDEA 02

REWARD UTILITIES FOR EXCEEDING EFFICIENCY GOALS

The Arizona Corporation Commission rewards utilities with performance bonuses for meeting or exceeding energy efficiency program targets. Third party measurement and evaluation contractors report performance results directly to ACC staff.

Purpose

Free markets show us that proper incentive structures encourage performance. Decoupling mitigates disincentives. Achieving and over-achieving against targets in energy efficiency benefits everyone. Utilities' shareholders should be rewarded for providing outstanding service while saving more energy.

Key Enablers

Arizona Corporation Commission

Key Stakeholders

Utilities, SWEEP, RUCO, AARP, AZ Community Action Association, AZ for Electric Choice & Competition, AZ Interfaith Power & Light, AZ PIRG, Sierra Club, EE manufacturers, EE implementers

Challenges

Any utility rewards will ultimately come from ratepayers, some of whom may value lower current energy costs over long term savings. Accurate and unbiased savings measurement mechanisms are critical.

References and More Information

energize.asu.edu > Policy Options > Idea #02

IDEA 03

EVALUATE EFFICIENCY MEASURES AT THE PROGRAM LEVEL

The Arizona Corporation Commission alters its cost-benefit analysis to look at all of a utility's energy efficiency programs combined, rather than separately.

Purpose

As in other industries, it occasionally makes sense to introduce an efficiency program that does not meet the cost-benefit threshold of the Arizona Corporation Commission's Societal Cost Test (SCT) but serves as a "loss leader" to kick-start a new program or to influence participation in other programs. Perhaps there are also social goals (such as low-income customer assistance) or dramatic savings that come into play. Utility programs and ratepayers can benefit from flexibility gained by measuring on total portfolio performance.

Key Enablers

Arizona Corporation Commission

Key Stakeholders

Utilities, SWEEP, RUCO, AARP, AZ Community Action Association, AZ for Electric Choice & Competition, AZ Interfaith Power & Light, AZ PIRG, Sierra Club, EE manufacturers, EE implementers

Challenges

While the overall portfolio will still meet the SCT, the total investment rate of return on ratepayer EE fees will go down as not every individual program will be profitable.

References and More Information

energize.asu.edu > Policy Options > Idea #03

IDEA 04

MEASURE AND REWARD HEAT ISLAND REDUCTIONS

The Arizona Corporation Commission permits utilities to count energy savings due to urban heat island reduction when calculating cost-benefit and incentives related to specific measures.

Purpose

The Urban Heat Island (UHI) effect significantly increases the amount of energy needed to cool homes and buildings. Research can estimate the energy savings benefit created by a reduction in nighttime temperatures related to specific retrofits, such as installing a cool roof. Given the data, utility programs should incentivize, on a pro-rata basis, residents and businesses that undertake these measures.

Key Enablers

Arizona Corporation Commission

Key Stakeholders

Utilities, SWEEP, RUCO, AARP, AZ Community Action Association, AZ for Electric Choice & Competition, AZ Interfaith Power & Light, AZ PIRG, Sierra Club, EE manufacturers, EE implementers, Architects, University climatologists

Challenges

While the science, data and computing power are available, the actual calculations have not been done at the necessary scale. Therefore, the size of the savings on an individual building basis is not yet known.

References and More Information

energize.asu.edu > Policy Options > Idea #04

IDEA 05

UPGRADE CABLE AND SATELLITE BOXES

The Governor's Office of Energy Policy works with cable and satellite television providers to optimize the energy performance of set top boxes through Energy Star replacement and changes to head-end software settings.

Purpose

In 2010, television set top boxes (STB) in the U.S. consumed an estimated 27B kWh of electricity. Significant savings can be achieved through more-efficient devices and through software programming changes pushed out by the service provider.

Key Enablers

Arizona Governor's Office of Energy Policy

Key Stakeholders

Television service providers, STB manufacturers, Utilities, SWEEP, Residential utility customers

Challenges

Set top box replacement is driven by television service provider financial models that use projected lifespans for ROI purposes. Accelerating that schedule may be challenging unless utility incentives can offset additional costs.

References and More Information

energize.asu.edu > Policy Options > Idea #05

IDEA 06

PROVIDE ENERGY DATA IN AN APP-FRIENDLY FORMAT

A utility provides its residential customers the ability to download their energy usage data or share access to it with others in the standard Green Button format created by USDOE and utilities, thereby providing a scalable market to entrepreneurial software developers to create applications that help people monitor and manage their energy usage.

Purpose

By making household electricity usage data available in a national standard format, utilities help create a market for software application developers to create innovative and productive uses of that data.

Key Enablers

Utilities

Key Stakeholders

USDOE, Arizona Corporation Commission, Residential utility customers, Software developers

Challenges

Utility IT systems can be cumbersome to modify and may not have data fields that map cleanly to all fields in the standard. Standards evolve, requiring additional utility software work. Any connection to databases creates potential data privacy and security risks.

References and More Information

energize.asu.edu > Policy Options > Idea #06

IDEA 07

CREATE EFFICIENCY PROGRAMS FOR SMALLER UTILITIES

The Governor's Office of Energy Policy or a non-profit organization offers and administers energy efficiency programs for customers of multiple small utilities in Arizona. The utilities cooperatively fund the programs through ratepayer fees.

Purpose

The complexities and overhead costs of running comprehensive utility energy efficiency programs can be unmanageable for utilities with a small customer base. Consolidating program design and administration under one third party can capture efficiencies of scale.

Key Enablers

Arizona Corporation Commission, Arizona Governor's Office for Energy Policy, NGOs

Key Stakeholders

Utilities, SWEEP, RUCO, AARP, AZ Community Action Association, AZ for Electric Choice & Competition, AZ Interfaith Power & Light, AZ PIRG, Sierra Club, EE manufacturers, EE implementers

Challenges

Each utility is likely to have unique customer characteristics and needs. The ACC would need to rule on a single, multi-utility implementation plan. A lack of trained and qualified contractors exists in some areas. Equitable distribution of incentives among utility territories would need to be ensured.

References and More Information

energize.asu.edu > Policy Options > Idea #07

IDEA 08

ENACT PROPERTY ASSESSED CLEAN ENERGY (PACE) FINANCING

The Arizona State Legislature enacts PACE-enabling legislation into the Arizona Revised Statutes, allowing property owners to fund energy efficiency projects on their homes and commercial buildings through a low-cost, local government loan which is repaid by a multi-year tax assessment that remains an obligation on the property rather than the property owner, regardless of sale or transfer.

Purpose

Implementing energy efficiency projects and distributed generation systems involves high up-front costs while benefits accrue over time. This typically limits adoption to higher income businesses and individuals. PACE overcomes this barrier by allowing municipalities to help willing property owners finance such projects, matching the timing of costs more closely with benefits.

Key Enablers

Arizona State Legislature, Local government

Key Stakeholders

EE manufacturers, EE implementers, RE manufacturers, RE implementers, RE lessors, SWEEP, Residential utility customers, Commercial utility customers, Local governments, Regional associations of governments, Lenders, Mortgage-backed securities owners, Escrow agents, Title companies, realtors, Third party administrators

Challenges

The Arizona State Legislature must first pass PACE-enabling legislation in order to allow local governments to establish PACE programs. Additionally, the Federal Housing Finance Agency has effectively halted residential PACE programs in most places in the U.S. due to concerns regarding PACE lien priority over mortgages. Any future PACE legislation will have to address this mortgage lenders' concern. Once PACE legislation is enacted, PACE program administration will have to be set up, either by a centralized organization or by individual local governments.

References and More Information

energize.asu.edu > Policy Options > Idea #08

IDEA 09

PROVIDE ON-UTILITY BILL FINANCING

A utility provides, through a partnership with a lending institution, the ability for a homeowner or business owner to finance energy efficiency improvements and make payments on the loan through their monthly utility bill.

RESIDENTIAL AND COMMERCIAL

Purpose

Homeowners and commercial enterprises might be reluctant to invest in energy efficiency projects on their properties due to up-front costs and a concern that they may leave the premises before recouping their investment through the energy savings. Like PACE, on-bill recovery overcomes these obstacles by arranging for up-front funding from the utility or from third party lenders. The repayment is made through a surcharge on the property's utility bill and the obligation to repay runs with utility service to the premises rather than attaching to the property owner.

Key Enablers

Arizona Corporation Commission, Utilities, Lenders

Key Stakeholders

SWEEP, RUCO, AARP, EE technology manufacturers, EE implementers, AZ Community Action Association, AZ for Electric Choice & Competition, AZ Interfaith Power & Light, AZ PIRG, Sierra Club, Lenders, Escrow agents, Title companies, Realtors

Challenges

The Corporation Commission's authority may be challenged over whether it may implement an on-bill recovery mechanism. There would also be a question as to the scope of consequences for an individual or business that fails to pay the on-bill financing portion of the utility bill. If a third-party lender is involved, various lending laws could become an issue. Also, the program would require an administrative program that might require an added data collection process and billing system.

References and More Information

energize.asu.edu > Policy Options > Idea #09

IDEA 10

ISSUE QUALIFIED ENERGY CONSERVATION BONDS (QECBs)

A local government issues federally-qualified bonds and lends funds out to residents and businesses at low interest rates to undertake energy efficiency upgrades.

RESIDENTIAL AND COMMERCIAL

Purpose

Public financing tools can significantly lower the costs of energy efficiency projects, increasing the quantity of projects and depth of retrofits undertaken. QECBs are particularly low-cost because the U.S. Treasury subsidizes the tribe, state, or local government's borrowing costs. They are also available to fund a wide variety of clean energy initiatives, including providing grants or loans to community energy efficiency programs, supporting research, and developing demonstration or education campaigns.

Key Enablers

Local government, Arizona Commerce Authority

Key Stakeholders

Financial advisors, EE technology manufacturers, EE implementers, Tax equity investors

Challenges

QECBs require several months to structure and administer, and the bond issuance costs might be costly for certain QECB allocations. Local governments might be unwilling to take on this added workload, as well as reluctant to take on added debt from the bond issuance. QECBs are meant for a broad range of clean energy initiatives which has led to uncertainty as to what projects qualify. This has been at least partially clarified by the U.S. Treasury and the IRS in their June 2012 Guidance (IRS Notice 2012-44).

References and More Information

energize.asu.edu > Policy Options > Idea #10

IDEA 11

BUY DOWN PRIVATE LENDING

A local government marginally raises sales taxes on energy sales to fund interest rate buy-downs of loans from a private sector lender for energy efficiency upgrades.

Purpose

Affordable financing increases the average project size per participant. Buying down interest rates on private lending increases participation, uses resources as efficiently or more efficiently than rebates, and leverages private capital markets to expand funding.

Key Enablers

Local government, Lenders

Key Stakeholders

Utilities, ACC, EE manufacturers, EE implementers, Remodeling contractors, SWEEP, AZ PIRG, Sierra Club, AZ Interfaith Power & Light, AZ Electric Choice & Competition, AZ Community Action Association

Challenges

Keeping the paperwork and process simple for participants, given the number of large institutional partnerships involved.

References and More Information

energize.asu.edu > Policy Options > Idea #11

IDEA 12

ESTABLISH PERIODIC BUILDING TUNE-UPS

A local government or the Arizona State Legislature requires all buildings over a minimum size to undertake a retro-commissioning process every five years to identify problems and re-calibrate energy using building systems.

Purpose

Substantial energy can be saved when building systems are evaluated, maintained and calibrated on a regular basis or when a remodel or change of use alters system needs.

Key Enablers

Local government, Arizona State Legislature

Key Stakeholders

Utilities, Arizona Corporation Commission, EE manufacturers, EE implementers, Commercial utility customers

Challenges

Mandating retro-commissioning can be viewed by some as more government regulation, expense, and intrusion into business, despite its high return on investment and awareness-building potential.

References and More Information

energize.asu.edu > Policy Options > Idea #12

IDEA 13

SET MINIMUM THRESHOLDS FOR ENERGY PERFORMANCE

A local government requires that a home be tested and, if necessary, upgraded during a sales transaction to meet a minimum threshold of energy performance (such as meeting a Home Energy Rating Score target or meeting particular Home Performance with Energy Star test thresholds).

Purpose

The real estate transaction process is an opportune time to perform basic upgrades to improve home performance. Inspections that can uncover energy issues are typically happening during the process and operating costs are a buyer consideration.

Key Enablers

Local government

Key Stakeholders

Home buyers, Home sellers, Realtors, Lenders, Appraisers, Escrow agents, Title companies, Home inspectors, AZ ASHI, InterNACHI, EE manufacturers, EE implementers, Utilities, County recorder

Challenges

Financially-distressed sellers may not have funds to perform any required upgrades. Adds more complexity, time, and uncertainty onto the sales process. Enforcement.

References and More Information

energize.asu.edu > Policy Options > Idea #13

IDEA 14

PROVIDE SALES TRAINING TO CONTRACTORS

A local government sponsors custom sales training for upgrade contractors that combines proven sales techniques with energy efficiency nuances and behavioral research findings.

Purpose

Energy efficiency contracting companies tend to be smaller, with more technical skills than sales and marketing skills. Efficiency Maine provided a custom sales training that raised customer conversion rates from 10% to 60%.

Key Enablers

Local government

Key Stakeholders

EE implementers, Arizona Home Performance with Energy Star, Utilities, Residential utility customers, Commercial utility customers

Challenges

Requires resources. Requires identifying trainers with professional sales skills and knowledge of the EE market.

References and More Information

energize.asu.edu > Policy Options > Idea #14

IDEA 15

TARGET CUSTOMERS MOST LIKELY TO RESPOND

A utility segments its customer base to target behavior-based marketing messages for specific efficiency measures to those who are more likely to respond and follow through. Communications timing is also employed (such as when a customer pulls a pool permit or remodeling permit).

Purpose

Most mature industries and modern political campaigns have undertaken market segmentation efforts to best communicate the right message to the right customer audience at the right time. APS recently undertook such an exercise for its residential EE programs and increased its direct mail response rate from 1% to 5.7%.

Key Enablers

Utilities

Key Stakeholders

EE implementers, Residential utility customers, Commercial utility customers, Arizona Corporation Commission

Challenges

Utilities have cultures and obligations that reinforce treating customers equally. Targeted programs or messages challenge this pattern. Utilities have mostly not previously undertaken segmentation efforts, APS' recent activity being a noteworthy exception.

References and More Information

energize.asu.edu > Policy Options > Idea #15

IDEA 16

LAUNCH A RECOGNITION PROGRAM

A local government or utility provides performance or upgrade completion certificates to homeowners and business owners to recognize their participation and to market programs to peers. Recognition is also provided on a website and/or through public relations and case studies.

Purpose

Recognition, both positive and negative, is a powerful force for motivating behavior. Providing credible, third-party recognition for energy efficiency program participation or for outstanding savings is an inexpensive method of rewarding leaders and encouraging others to also implement best practices.

Key Enablers

Utilities, Arizona Home Performance with Energy Star, Local government, NGOs

Key Stakeholders

Commercial utility customers, Residential utility customers, EE manufacturers, EE implementers, Multiple Listing Service boards

Challenges

Staff availability to coordinate. PR risk associated with quality assurance. Liability risk associated with an implied savings guarantee. Depending on partners involved, potential data privacy issues.

References and More Information

energize.asu.edu > Policy Options > Idea #16

IDEA 17

SET MINIMUM STANDARDS FOR APPLIANCE EFFICIENCY

The Arizona State Legislature updates minimum statewide home and appliance efficiency standards, allowing municipalities to establish their own standards higher than the state minimum. Either body includes standards for appliances that do not yet have federal minimum standards.

Purpose

State minimum appliance efficiency standards ensure that even as new types of home appliances and the markets for them proliferate, energy consumption can level out or decrease. State efficiency standards also protect consumers from products that waste energy and money and over the long-term.

Key Enablers

Arizona State Legislature, Local government

Key Stakeholders

Appliance vendors, Appliance manufacturers, Arizona Governor's Office of Energy Policy, SWEEP, Residential utility customers, Commercial utility customers

Challenges

Continuous development of new types of appliances makes it difficult to keep standards current. Classification of new appliances can also be complex and disputed. State jurisdiction over efficiency standards is generally limited to those for which a national standard does not yet exist. Manufacturers generally prefer a unified federal standard over state standards.

References and More Information

energize.asu.edu > Policy Options > Idea #17

IDEA 18

ADOPT STATE-OF-THE-ART ENERGY CODES

The Arizona State Legislature sets a minimum statewide building energy code, specifically the International Energy Conservation Code (IECC), second-to-most recent version. Local governments are still guaranteed home rule authority and are encouraged to set higher codes, such as the current version of the IECC. Technical assistance and training are provided by the Governor's Office of Energy Policy on the IECC to builders and code officials in localities that have not previously adopted this code.

Purpose

Strong energy codes can help ensure that buildings are built efficiently from the start. Newer versions of codes save substantial amounts of energy over older versions.

Key Enablers

Arizona State Legislature, Local government

Key Stakeholders

Developers, Architects, Contractors, Engineers, Energy modelers, EE manufacturers, EE implementers, Arizona Building Officials, Arizona Corporation Commission, Residential utility customers, Commercial utility customers

Challenges

Some jurisdictions do not have an energy code or are using antiquated ones. Education of code officials and contractors is essential. Codes are only as good as the education of the workforce to comply and the enforcement of them.

References and More Information

energize.asu.edu > Policy Options > Idea #18

IDEA 19

ADOPT VOLUNTARY STATE-OF-THE-ART GREEN BUILDING CODES

A local government adopts the International Green Construction Code (IGCC) on a voluntary basis and provides financial or non-financial incentives for developers to comply with it. This can be applied throughout a jurisdiction or in an overlay district. The municipality enjoys lower infrastructure impact from the buildings because of their high performance features (energy, water, sewer, streets, heat island).

Purpose

Energy efficiency is a key feature of green building. The International Green Construction Code (IGCC) also addresses other building impact and performance areas. Some of these, such as cool roofs and water efficiency measures, also have a positive impact on energy savings.

Key Enablers

Local government

Key Stakeholders

Developers, Architects, Landscape architects, Engineers, Contractors, Energy modelers, EE manufacturers, EE implementers, Utilities, Arizona Building Officials, Arizona Corporation Commission, Residential utility customers, Commercial utility customers

Challenges

Financial or non-financial incentives are needed to gain significant voluntary uptake. The architectural & engineering and building trades, as well as code officials, need to be trained. Funding for marketing, education, and awareness are essential.

References and More Information

energize.asu.edu > Policy Options > Idea #19

IDEA 20

ADOPT VOLUNTARY NET ZERO ENERGY BUILDING CODES

A local government adopts the Pima County / City of Tucson voluntary Net Zero Energy Code, possibly the first such code in the nation, and provides incentives for builders to meet the code requirements of zero net source energy.

Purpose

Strong energy codes can help ensure that buildings are built efficiently from the start, with a goal to reach the Architecture 2030 target of Net Zero energy buildings by 2030. Voluntarily reaching for Net Zero energy usage presents leadership that attracts others to follow.

Key Enablers

Local government

Key Stakeholders

Developers, Architects, Contractors, Engineers, Energy modelers, EE manufacturers, EE implementers, Utilities, Arizona Building Officials, Arizona Corporation Commission, Residential utility customers, Commercial utility customers

Challenges

While feasible for many buildings, Net Zero requires expertise, integrated design, resources and on-site renewable energy. Net Zero buildings present problems for utilities whose rate structure is not decoupled. The architectural & engineering and building trades, as well as code officials, need to be trained.

References and More Information

energize.asu.edu > Policy Options > Idea #20

IDEA 21

REWARD BUILDERS OF EFFICIENT NEW HOMES

Similar to some utilities, a local government (or the Arizona State Legislature) rewards homebuilders who build very efficient homes by reducing their development impact fees (or providing them a tax credit) based upon a third-party rating of the energy savings of their homes.

Purpose

Rewarding innovators who take risks in navigating less-charted waters is an established method of encouraging broader progress toward community goals.

Key Enablers

Local government, Arizona State Legislature

Key Stakeholders

Developers, Builders, utilities, EE manufacturers, Arizona Building Officials, energy raters, NGOs

Challenges

Creating niche tax incentives is can be controversial. Impact fees are typically more aligned with water, sewer, parks and roads infrastructure. Policy needs to build in mechanisms to keep performance targets up to date.

References and More Information

energize.asu.edu > Policy Options > Idea #21

IDEA 22

ENCOURAGE ENERGY EFFICIENT REMODEL PROJECTS

When a homeowner or contractor applies for a permit for remodeling, the local development services office encourages the homeowner to get a whole home energy audit or rating and informs the homeowner of local government and utility incentives (including permit fee offsets) for improving the energy performance of the home concurrent with the remodeling project. A Home Performance with Energy Star audit or a HERS rating is required before the project and after the project to determine savings and incentive amount.

Purpose

Remodeling projects are an opportunity to either improve or seriously degrade the energy performance of a home or building. By placing incentives on increased performance, the marketplace becomes educated on the potential impacts of remodeling.

Key Enablers

Local government

Key Stakeholders

Commercial utility customers , Remodeling contractors, EE manufacturers, EE implementers, Residential utility customers, Arizona Home Performance with Energy Star, RESNET, Utilities, Energy raters, Arizona Building Officials

Challenges

Rating the energy performance of existing homes is more challenging than rating new homes. Potential conflicts between remodeling contractor and energy rating contractor. Potential competition between HPwES and RESNET as to appropriate standard/process to use. An alternative program of granting incentives for individual energy conservation measures taken ignores the systems nature of the home.

References and More Information

energize.asu.edu > Policy Options > Idea #22

IDEA 23

CREATE EFFICIENCY COMPETITIONS FOR NON-PROFITS

A local government and a utility partner to provide cash prizes to local non-profit organization(s) that recruit organization members or target community members to participate in energy efficiency upgrades and/or whose members save the most energy.

Purpose

Competitions have proven to be effective behavioral tools to encourage energy efficiency behaviors. When combined with resource prizes for financially-strapped non-profit organizations or schools, their effectiveness can be increased. Competitions can also be shaped to align with the missions of various non-profit organizations (assisting low-income families, environmental stewardship, etc.).

Key Enablers

Local government, Utilities

Key Stakeholders

Utilities, NGOs, EE manufacturers, EE implementers, Residential utility customers, Commercial utility customers

Challenges

Competition administrator must ensure compliance with state laws regarding contests and lotteries. Competitions can conflict with local governments' and utilities' desire/mandate to treat customers equally.

References and More Information

energize.asu.edu > Policy Options > Idea #23

IDEA 24

DISCLOSE ENERGY USE DURING RESIDENTIAL REAL ESTATE TRANSACTIONS

A local government or the Arizona State Legislature requires disclosure of a home's previous year actual energy usage during the real estate transaction process, either as part of the property listing or privately during the inspection period. For new homes, energy use estimates are to be derived from third party certifications or from approved energy modeling software reports.

Purpose

MPG ratings are provided to car buyers to assist in understanding the operating costs of their purchase. Disclosure is also a signal that the information is an important consideration during the purchase decision. Homes come with significant operating costs, energy being one of the largest. Disclosure between seller and buyer would promote transparency and create an incentive to reduce the energy operating costs of homes.

Key Enablers

Arizona State Legislature, Local government, Arizona Department of Real Estate

Key Stakeholders

Arizona Association of Realtors, Utilities, Escrow agents, Developers, Builders, Arizona Building Officials, Multiple Listing Service boards, Lenders, Energy raters

Challenges

Variations in rules among neighboring jurisdictions can cause market confusion. How to accommodate properties owned less than a year and properties that have been unoccupied. Development of lease contract solutions for rental properties where the seller does not have access to renter's utility data.

References and More Information

energize.asu.edu > Policy Options > Idea #24

IDEA 25

INCORPORATE ENERGY PERFORMANCE INTO PROPERTY APPRAISALS

A local government or lenders require the completion of the Green Appraisal Addendum (from the Appraisal Institute) during all residential property appraisals and consideration of energy efficiency and renewable energy features in home valuation.

Purpose

Incorporating energy use data into the property valuation process creates a more complete picture of total cost of ownership and total value. Not only are homebuyers made more aware of this important operating cost feature but, over time, a database for more accurate comp analysis process for appraisers is achieved.

Key Enablers

Local government, Lenders

Key Stakeholders

State Board of Appraisal, Appraisal Foundation, Appraisal Institute, Independent appraisers, Arizona Association of Realtors, USGBC-AZ

Challenges

Lender consensus to implement at scale. Education of appraisers on proper use of the Addendum. Addendum fields can evolve, making historical comparisons more challenging. Lack of data currently. Competing continuing education offerings for appraisers. Industry cost reduction trends that have put pressure on appraisers' investment of time to complete appraisals.

References and More Information

energize.asu.edu > Policy Options > Idea #25

IDEA 26

IMPROVE THE GREEN FEATURES IN MULTIPLE LISTING SERVICES (MLS)

A local government or the Arizona Department of Real Estate convenes a stakeholder group to work with local MLS services to refine existing fields for seamless ease of use, accountability, and to address liability issues. The convener also sponsors a substantial education effort for realtors on proper use.

Purpose

Providing meaningful and highly-usable green features in Multiple Listing Services (MLS) allows potential buyers to integrate energy efficiency and other considerations into the mainstream home purchasing process. Because of social norms, when homebuyers and sellers see features noted in listings, they are more likely to value them when doing comparative evaluations of properties.

Key Enablers

Local government, Arizona Department of Real Estate, Multiple Listing Service boards

Key Stakeholders

Home buyers, Home sellers, Appraisers, Lenders, Energy raters, Green raters, Home inspectors, AZ ASHI, InterNACHI, EE implementers, EE manufacturers, USGBC-AZ

Challenges

Lack of realtor education on energy and green features. Realtor liability. Reliability of listing data (verification mechanism). Field structure limitations of MLS systems. MLS changes rely upon volunteer committee member availability and effort. De-centralization of MLS operations (ARMLS, Tucson MLS, NAAR MLS, GVSAR MLS, WARDEX, Prescott MLS, LaPaz MLS, Southeast Arizona MLS).

References and More Information

energize.asu.edu > Policy Options > Idea #26

IDEA 27

PUBLISH ENERGY USAGE DATA FOR BUILDINGS

A local government or the Arizona State Legislature requires all owners of buildings of a minimum size to annually report their energy usage through the Energy Star Portfolio Manager for benchmarking and then publishes results on a public website. Utilities are obligated to provide aggregated usage data to multi-tenant building owners.

Purpose

Social norms and market forces can create significant motivation for improving efficiency of existing building stock. By publishing actual energy usage publicly, potential buyers or tenants can include operating cost considerations into property selection and/or price negotiation. Published data will also provide owners with benchmarks by which to judge their own property as well as create social norms and competitive pressure for building owners with high energy usage to bring their property more into line. Speculative developers will also consider energy performance in development plans.

Key Enablers

Local government, Arizona State Legislature, Arizona Corporation Commission

Key Stakeholders

Commercial utility customers, Developers, Facility managers, Utilities, EE manufacturers, EE implementers, Appraisers, Commercial brokers, Tenants, Building buyers

Challenges

Raises privacy concerns for some owners. Creates work and liability issues on part of utilities to aggregate data of multi-tenant buildings and to report data. Substantial energy usage is not under landlord control. Tenant contract changes are anticipated to give landlord access to tenant energy data.

References and More Information

energize.asu.edu > Policy Options > Idea #27

IDEA 28

AUTOMATE ENERGY USAGE INFORMATION

A utility provides an IT solution for building owners to automate the uploading of their energy usage information into Energy Star Portfolio Manager for benchmarking purposes.

Purpose

Benchmarking energy data in EPA Energy Star Portfolio Manager for internal purposes or disclosure purposes can consume staff time in order to keep it up to date. By creating an automated update system, a utility can reduce commercial customers' costs and increase energy awareness through Portfolio Manager, as well as increase participation in utility-offered efficiency programs. Automating the process can also increase acceptance of disclosure ordinances and reduce utility customer service costs in assisting building owners.

Key Enablers

Utilities

Key Stakeholders

Commercial utility customers, Facility managers, EE implementers, Local government, Building buyers, Tenants, Commercial brokers

Challenges

Requires investment of utility IT labor resources. Potentially requires internet connection to utility IT systems, which increases security risks.

References and More Information

energize.asu.edu > Policy Options > Idea #28

IDEA 29

CERTIFY ENERGY PERFORMANCE

A local government or the Arizona State Legislature requires a home seller to acquire and disclose a Home Energy Rating Service (HERS) score or a Home Performance with Energy Star (HPwES) annual energy consumption estimate from a qualified third-party rater/contractor. That policymaking body also encourages the local MLS boards to incorporate the information in the MLS listing fields.

Purpose

Incorporating energy usage transparency into real estate transactions grows demand for efficiency and, therefore, home upgrades. Requiring home sellers to acquire and disclose an energy rating and persuading the Multiple Listing Service (MLS) boards to incorporate those ratings into listings will help educate home sellers, buyers and contractors on the benefits of efficiency upgrades.

Key Enablers

Local government, Arizona State Legislature, Multiple Listing Service boards

Key Stakeholders

Home buyers, Home sellers, Arizona Department of Real Estate, Arizona Association of Realtors, Appraisers, RESNET, AZ Home Performance with Energy Star, Energy raters, Utilities

Challenges

Adds time and financial costs to the real estate sales process in a still-recovering market. De-centralization of the MLS systems. Requires realtor education. Creates exponential increase in demand for rater workforce.

References and More Information

energize.asu.edu > Policy Options > Idea #29

IDEA 30

CREATE A TRUE HOME COST CALCULATOR

A local Multiple Listing Service creates a web-based True Home Cost calculator that uses a home's green MLS listing data as well as local insurance industry data to estimate monthly costs, including Principal, Interest, Taxes, Insurance, Energy and Water/Sewer.

Purpose

Many websites provide a home mortgage calculator. Expanding the concept to incorporate operating costs would empower home buyers to more accurately compare the total costs of different homes.

Key Enablers

Multiple Listing Service boards

Key Stakeholders

Arizona Association of Realtors, Home buyers, Home sellers, Appraisers, Utilities, Energy raters, Arizona Home Performance with Energy Star, RESNET, Developers, Builders, EE implementers, EE manufacturers

Challenges

Developing liability clauses for MLS and realtors. Challenges in selecting data source and acquiring data. Variability in insurance costs. IT and maintenance costs of system. Past performance does not necessarily predict future performance.

References and More Information

energize.asu.edu > Policy Options > Idea #30

IDEA 31

EDUCATE REALTORS ON THE GREEN MLS AND GREEN APPRAISAL ADDENDUM

The Arizona Department of Real Estate requires all state-licensed realtors to complete a continuing education course that teaches the proper use of energy efficiency and green features in the Multiple Listing Services, as well as an overview of the Green Appraisal Addendum.

Purpose

Professional education is a necessary component for success in any marketplace change, whether policy-driven or by private-sector initiative. Realtors will be capable of documenting and educating home sellers and home buyers on energy efficiency and green features when they are educated on the details of the subject and documentation requirements.

Key Enablers

Arizona Department of Real Estate

Key Stakeholders

Arizona Association of Realtors, Appraisal Institute, Educators, Appraisers, Lenders

Challenges

Arizona Department of Real Estate may feel that mandating such courses would be too specific and prefer current practice of mandating credits earned within categories of courses rather than specific courses. Training qualified trainers. Variations among local Multiple Listing Services. Competing education topics for realtors.

References and More Information

energize.asu.edu > Policy Options > Idea #31

IDEA 32

EDUCATE APPRAISERS ON THE GREEN APPRAISAL ADDENDUM

The Arizona Board of Appraisal requires all State-licensed residential appraisers to complete a continuing education course that teaches the proper use of the Green Appraisal Addendum and the Income Approach to calculate the added value of energy efficiency features.

Purpose

Professional education is a necessary component for success in any marketplace change, whether policy-driven or by private-sector initiative. With training on this addendum, which allows for documentation of energy efficiency and other green features in homes, appraisers are more apt to properly value these features and home sellers are more likely to re-coup their investments in energy efficiency. While appraisers are likely to take the Income Approach to valuation in the beginning, a database of feature values will build over time so that valuation comparisons between homes can be made.

Key Enablers

Arizona Board of Appraisal

Key Stakeholders

Appraisers, Lenders, Arizona Association of Realtors, Home buyers, Home sellers

Challenges

The Board of Appraisal requires licensing education and continuing education within broad categories and may not be favorable to requiring specific courses. Current course listings do not include any green or energy courses. Training enough qualified trainers.

References and More Information

energize.asu.edu > Policy Options > Idea #32

IDEA 33

EDUCATE CONTRACTORS ON ENERGY CODES

A local government requires general and mechanical contractors to acquire education on the latest version of the International Energy Conservation Code (IECC) to secure a building permit for any project that impacts the building envelope or the building's mechanical systems.

Purpose

Ensuring contractors have a minimum knowledge of energy codes, trends and best practices is essential to achieving the goal of reducing energy consumption and costs, and will help develop a better workforce.

Key Enablers

Local government

Key Stakeholders

Arizona Registrar of Contractors, Contractors, Developers, Builders, EE implementers, Residential utility customers, Commercial utility customers, Arizona Building Officials, Educators, Regional association of governments

Challenges

The Arizona Registrar of Contractors typically governs contractor requirements so education rules set by local government may face resistance. Introduces potential delays in permitting. Need to provide adequate phase-in time. Need to train additional trainers and have frequent availability of classes (or online). Determining requirements for which employee positions within a larger contractor need training will be complex.

References and More Information

energize.asu.edu > Policy Options > Idea #33

IDEA 34

ESTABLISH CONTRACTOR CONTINUING EDUCATION

The Arizona Registrar of Contractors requires appropriate categories of contractor license holders to obtain a minimum number of continuing education training hours in energy efficiency subjects related to the most current version of the International Energy Efficiency Code (IECC) in order to obtain and/or maintain their license.

Purpose

Continuing education requirements ensure that licensed professionals are apprised of best practices and the latest advancements in their field. Requiring energy efficiency education throughout a contractor's professional life will help increase the use of newer energy efficiency technologies and practices.

Key Enablers

Arizona State Legislature, Arizona Registrar of Contractors

Key Stakeholders

Contractors, Developers, Builders, EE implementers, Residential Utility customers, Commercial utility customers, Arizona Building Officials, Educators, Unions, Arizona Association of Realtors

Challenges

The Arizona Registrar of Contractors does not currently require any educational courses as part of its licensing standards, so requiring energy efficiency continuing education would be a major change in its licensing program.

References and More Information

energize.asu.edu > Policy Options > Idea #34

IDEA 35

ENSURE THE RIGHT WORKERS ARE TRAINED

A local government provides workforce development wages for candidates to gain exposure to the field by fully participating in a pre-apprenticeship orientation program for building science and residential energy efficiency.

Purpose

Currently, many home performance workforce trainees leave the field shortly after completing training. Home performance work is inglorious and challenging, particularly in a climate where attics can reach 140 degrees or more. By getting exposure to the work before going through expensive training, potential workers can decide their level of commitment to the work before investment of significant public training funds.

Key Enablers

Local government, Federal workforce development programs

Key Stakeholders

Southwest Building Science Training Center, Workforce development candidates, Educators, EE implementers, Residential utility customers

Challenges

Liability issues related to apprentices potentially working on actual projects. Apprenticeship program does not eliminate potential exploitive workplace conditions post-apprenticeship, so workforce turnover might not be reduced as much as hoped.

References and More Information

energize.asu.edu > Policy Options > Idea #35

IDEA 36

ESTABLISH MINIMUM THRESHOLDS FOR BUILDING SCIENCE TRAINING

The Arizona Home Performance with Energy Star program requires all upgrade contractor field employees to acquire training and certification appropriate to the services they perform.

Purpose

Understanding the appropriate elements of building science is an important part of performing quality work. If all contractors and their employees who are performing home performance work are trained and certified to a standard appropriate to their role, it would improve the quality and the reputation of the industry.

Key Enablers

Arizona Home Performance with Energy Star, Southwest Building Science Training Center

Key Stakeholders

Utilities, EE implementers, Residential utility customers

Challenges

Payroll and training costs for contractors to send their employees to training. High employee turnover. Efficient enforcement mechanisms.

References and More Information

energize.asu.edu > Policy Options > Idea #36

IDEA 37

PUBLISH PERFORMANCE RATINGS OF CONTRACTORS

The Arizona Home Performance with Energy Star program or a utility compile and publish a report card on each participating contractor, incorporating metrics such as customer surveys, ROC ID, number of projects completed, years participating, and number or percentage of employees that hold various certifications.

Purpose

Product or service rating systems empower customers, instill confidence, and promote quality. A transparent contractor performance rating system that includes quantitative metrics and customer satisfaction data assists potential energy efficiency customers in sifting through and comparing a potentially overwhelming volume of contractors before hiring. Empowering customers to submit their own satisfaction survey provides them with another quality assurance tool. This market-based solution promotes high performing contractors, strengthens the brand of the organizations providing the rating information to the public, and catalyzes demand.

Key Enablers

Arizona Home Performance with Energy Star, Utilities

Key Stakeholders

EE implementers, Residential utility customers

Challenges

Potential disagreement with EE implementers regarding the metrics used or system for gathering customer feedback. Potential exists for EE implementers' customer satisfaction ratings to be affected by program issues out of their control. A maintenance cost versus accuracy trade-off arises in determining the frequency of updates to scorecard ratings. Developing liability disclaimer. Newer participating EE implementers and smaller firms could be overly disadvantaged relative to larger firms or those who have participated for a long time period.

References and More Information

energize.asu.edu > Policy Options > Idea #37

IDEA 38

DETER ENERGY AUDITING IMPOSTERS

A local government or the Arizona State Legislature passes regulations prohibiting individuals from representing themselves as residential energy auditors or performing energy audit services unless they have passed a certification process (such as BPI or RESNET) and the services follow the procedures required by the certification body or its affiliate.

Purpose

Product sales companies and salespeople representing themselves as “energy auditors” who use pressure techniques to sell products that are oftentimes useless or significantly overpriced are rampant. Requiring a certification for individuals who market or perform home energy auditing services will curtail practices that mis-inform and defraud the public and damage the credibility of the industry.

Key Enablers

Arizona State Legislature, Local government

Key Stakeholders

Arizona Home Performance with Energy Star, RESNET, Building Performance Institute, EE implementers, EE manufacturers, Utilities, Residential utility customers, Arizona Attorney General, Arizona Corporation Commission, Arizona Registrar of Contractors, Better Business Bureau, Energy raters

Challenges

Public awareness regarding certification requirements. Developing regulations that cover various marketing terms that sales people may use to evade the regulations. Developing regulations that are flexible to allow for the emergence of credible new certifications and certification bodies.

References and More Information

energize.asu.edu > Policy Options > Idea #38

IDEA 39

REWARD ENERGY SAVINGS WITH VIRTUAL CURRENCY

A utility rewards residential customers with virtual currency, or “points,” for saving energy. Virtual currency can be used in existing online games (e.g., Farmville), redeemed for discount coupons at national or local businesses, or serve as a fundraising vehicle for schools or non-profit organizations.

Purpose

Virtual currency turns energy-efficient behavior into a game. People spend nearly two billion hours per year playing “Angry Birds,” and 43 million people play “Farmville” every month. Giving customers “points” for saving energy taps into our powerful motivations to play and to pursue rewards.

Key Enablers

Arizona Corporation Commission, Utilities

Key Stakeholders

Residential utility customers, SWEEP, RUCO, AARP, AZ Community Action Association, AZ for Electric Choice & Competition, AZ Interfaith Power & Light, AZ PIRG, Sierra Club, EE technology manufacturers, Social gaming providers, Rewards partners

Challenges

Rewards must accrue frequently and be easy to redeem. Only one proprietary provider offers an online platform for energy-savings rewards at this time. Contracts for rewards must be negotiated with businesses, or through partnerships with existing reward systems (e.g., Recyclebank, eScrip).

References and More Information

energize.asu.edu > Policy Options > Idea #39

IDEA 40

PROVIDE REAL-TIME ENERGY USE FEEDBACK

A utility provides real-time energy usage feedback to its customers, enabling them to make better-informed decisions about their energy consumption.

Purpose

Pilot programs show that immediate, prominent and quantifiable feedback on energy usage helps people conserve 4-9%, on average. Savings accrue as individuals become more aware of their energy usage, more knowledgeable about which appliances and technologies use the most energy, and more aware of how costs are influenced by variable rate plans. New and developing technologies can make real-time usage information engaging for consumers and accessible at home or from internet-enabled devices anywhere.

Key Enablers

Utilities, Arizona Corporation Commission

Key Stakeholders

EE manufacturers, EE implementers, Residential utility customers, Commercial utility customers, SWEEP, RUCO, AARP, AZ Community Action Association, AZ for Electric Choice & Competition, AZ Interfaith Power & Light, AZ PIRG, Sierra Club, Builders

Challenges

Program design and success varies widely so accurately estimating savings for ACC Societal Cost Test purposes is challenging with some approaches.

References and More Information

energize.asu.edu > Policy Options > Idea #40

IDEA 41

PRESENT SAVING ENERGY AS A SOCIAL NORM

Utilities, local government and the media encourage adoption of a behavior by showing that “everyone is doing it,” as well as everyday people believing that it’s a good thing to do.

Purpose

Social norms, or descriptive information about other people’s behavior, often guide our own actions even when we are not consciously aware of this influence. This principle has been applied to enhance sustainable behavior in a variety of ways, from reusing hotel towels to reducing residential energy use.

Key Enablers

Utilities, Media, Local government

Key Stakeholders

Arizona Corporation Commission, Arizona Governor’s Office of Energy Policy, Residential utility customers, Commercial utility customers, SWEEP, Sierra Club, AZ Interfaith Power & Light, Educators, NGOs

Challenges

Uncommon behaviors may not be amenable to social norm-based influence. Media message campaigns may require substantial resources to mount effectively.

References and More Information

energize.asu.edu > Policy Options > Idea #41

IDEA 42

MAKE IT EASY TO SET ENERGY CONSERVATION GOALS

Utilities, NGOs and/or software developers provide internet-based applications to help individuals or organizations set goals, define their own incentives, and identify clear steps toward goal attainment.

Purpose

Goal-setting programs (e.g., Stickk.com) help individuals or organizations to define desirable yet realistic goals, and set up incentives for reaching them (rewards, or punishments for failing to reach goals). Goal-setting programs should help individuals identify clear steps they can take to meet their goals, facilitate public commitment to change, and enable individuals to track their progress.

Key Enablers

Utilities, NGOs, Software developers

Key Stakeholders

SWEET, Sierra Club, AZ Interfaith Power & Light, Educators, Residential utility customers, Commercial utility customers

Challenges

Individuals or organizations must already desire change for this approach to be effective. Programs are easier to use if energy usage data is automatically uploaded into the software, which requires some form of integration with utility IT systems.

References and More Information

energize.asu.edu > Policy Options > Idea #42

IDEA 43

LINK EFFICIENCY PRODUCTS TO HIGH SOCIAL STATUS

Encourage “conspicuous conservation” by promoting development and sale of distinctive, high-end, high-visibility energy efficiency products (e.g., the Nest thermostat that learns).

Purpose

Conspicuous conservation helps fulfill fundamental status-seeking goals while also promoting sustainable energy usage. Technologies that are visually distinctive, have a relatively high price point, and are readily identifiable as a signal of commitment to eco-friendly values are ideal for this approach.

Key Enablers

Appliance manufacturers, EE manufacturers

Key Stakeholders

Utilities, Appliance vendors, Residential utility customers, Commercial utility customers

Challenges

Identifying or developing appropriate high-visibility energy efficiency technologies, as well as ways to advertise mostly invisible energy retrofits (e.g., insulation). Status-related placement preferences may interfere with functionality (e.g., solar panels on a shady but street-facing roof). Depends on high community value of conservation. May also create backlash from some who consider purchases to be elitist.

References and More Information

energize.asu.edu > Policy Options > Idea #43

IDEA 44

CREATE EFFICIENCY COMPETITIONS FOR ORGANIZATIONS

An organization, local government, or utility initiates an energy-saving competition and rewards winners with monetary or other prizes.

Purpose

Competitions at both the team and individual level are effective in encouraging energy efficiency behaviors, drawing on psychological processes of goal setting, public commitment, and social comparison. In particular, team competitions provide social support for behavior change and facilitate development of a group identity around the behavior.

Key Enablers

Commercial utility customers, NGOs, Utilities, Local government

Key Stakeholders

Residential utility customers

Challenges

Under certain circumstances, energy use may return to pre-competition levels once the competition is over.

References and More Information

energize.asu.edu > Policy Options > Idea #44

IDEA 45

PACKAGE EFFICIENCY UPGRADES WITH COSMETIC AND COMFORT UPGRADES

Energy efficiency contractors develop “package deals” that combine energy efficiency upgrades with related cosmetic, comfort and/or functionality-focused home upgrades.

Purpose

For middle- and upper-income families, the prospect of somewhat lower utility bills may not be enough to motivate an energy efficiency upgrade. A report by the Lawrence Berkeley National Laboratory suggests a “sell something people want” marketing strategy for promoting energy efficiency. Remodeling to improve cosmetic appearance and increase comfort or functionality may offer greater appeal.

Key Enablers

EE implementers

Key Stakeholders

Utilities, Residential utility customers

Challenges

Clearly tracking investment dollars and return on energy efficiency investment can be difficult if energy upgrades and other upgrades are combined. An energy efficiency contractor may not have the same skill set as a remodeling contractor.

References and More Information

energize.asu.edu > Policy Options > Idea #45

IDEA 46

PROMOTE GRASSROOTS INITIATIVES

A trained facilitator takes a systematic approach to understanding a community's specific energy goals, identifies benefits of and barriers to accomplishing those goals, and develops, evaluates and helps implement strategies to enact social change. A participating community is defined by members' close geographic proximity (e.g., a neighborhood) or shared interests and values (e.g., a faith-based organization).

Purpose

Community-Based Social Marketing (CBSM) interventions are five-step programs targeting specific behaviors (e.g., replacing incandescent light bulbs with CFLs). As grassroots-type movements, CBSMs are created by community members, and thus are tailored to address the needs and barriers within each community. Like competitions, CBSM seeks to draw upon community identity, and incorporate the target behavior into that sense of identity.

Key Enablers

NGOs, Utilities, Local government

Key Stakeholders

EE implementers, Residential utility customers, AZ Interfaith Power & Light, AZ Community Action Alliance

Challenges

By definition, CBSMs cannot be standardized across communities. Individual community-level implementation is required, with trained facilitators guiding the process. Local governments and utilities have cultures and obligations that reinforce treating customers equally. Targeted CBSM programs challenge this pattern. Costs associated with trained facilitators can be significant.

References and More Information

energize.asu.edu > Policy Options > Idea #46

GLOSSARY OF TERMS*

AARP American Association of Retired Persons, a non-profit membership organization and intervener in utility rate cases. (aarp.org)

Appliance manufacturers Organizations that design and produce residential and commercial appliances that consume energy.

Appliance vendors Organizations that sell residential and commercial appliances that consume energy.

Appraisal Foundation A not-for-profit organization with federally-delegated responsibilities to establish property valuation standards and appraiser qualification standards. (appraisalfoundation.org)

Appraisal Institute A non-profit membership organization whose mission is to advance professionalism and ethics, global standards, methodologies, and practices. (appraisalinstitute.org)

Appraisers Licensed residential and/or commercial property valuation experts.

Architects Licensed or unlicensed residential and/or commercial building designers.

Arizona Association of Realtors® (AAR) A trade association representing more than 38,000 Arizona REALTORS® subscribing to the Code of Ethics of the NATIONAL ASSOCIATION OF REALTORS® (NAR). (aaronline.com)

Arizona Attorney General Serves as the elected chief legal officer of the State. The Office of the Attorney General investigates and prosecutes consumer fraud. (azag.gov)

Arizona Building Officials A non-profit organization that represents the interests of the three International Code Council (ICC) Chapters in Arizona, promotes professionalism and educates the public regarding building codes. (azbo.us)

Arizona Corporation Commission An elected, constitutional fourth branch of government that has constitutional responsibility for granting or denying utility rate adjustments, enforcing safety and public service requirements, and regulating securities matters. (azcc.gov)

Arizona Department of Real Estate A state agency that regulates real estate (including licensure), cemetery and membership camping brokers and salespersons. (www.re.state.az.us)

Arizona Registrar of Contractors A state agency that licenses and regulates residential and commercial contractors. (azroc.gov)

AZ ASHI Arizona Chapter of the American Society of Home Inspectors, one of two organizations representing home inspectors in Arizona. (azashi.org)

AZ Community Action Association Arizona Community Action Association, a non-profit agency that develops and implements strategies to end poverty and a frequent intervener in utility rate cases. (azcaa.org)

* Definitions are tailored to the specific context in which they are used in this guide.

AZ for Electric Choice & Competition Arizonans for Electric Choice and Competition, a coalition of large retail electricity customers and a frequent intervener in utility rate cases. (azelectricity.com)

AZ Home Performance with ENERGY STAR (AZHPwES) An affiliate of the U.S. EPA's Home Performance with ENERGY STAR program, AZHPwES helps improve the safety, durability, comfort, and energy efficiency of homes while also helping to preserve the environment. (azhomeperformance.com)

AZ Interfaith Power & Light Arizona Interfaith Power & Light, a coalition of religious organizations whose aim is to reduce the causes of global climate change and which provides comments in utility rate cases. (azipl.org)

AZ PIRG Arizona Public Interest Research Group, a non-profit, citizen-funded consumer advocacy group and an intervener in utility rate cases. (arizonapirg.org)

Better Business Bureau A non-profit organization that provides services and programs to assist consumers and businesses participate in an ethical marketplace. (bbb.org)

BOMA Building Owners and Managers Association International, an association of commercial building owners and managers with two Arizona chapters. (boma.org)

Builders Umbrella term used to indicate residential home builders, from small custom builders to large production builders. Also includes their home sales staff.

Building buyers Individuals or companies in the market to purchase a commercial building.

Building Performance Institute A non-profit organization that develops standards and accreditation for energy efficiency retrofit work. (bpi.org)

Commercial brokers Agents who lease commercial or industrial buildings or space within them.

Commercial utility customers Organizations purchasing energy from a utility under a commercial rate plan.

Contractors General contractors and/or sub-contractors who build commercial, industrial or residential buildings.

County recorder The elected official and staff that maintain legal documents related to real estate property.

Developers Companies engaged in the acquisition and preparation of land for residential home construction by builders.

EE Implementers Umbrella term indicating those who do the physical energy efficiency upgrade work, from certified auditors to insulation installers to project managers and the companies that employ them.

EE Manufacturers Umbrella term indicating companies that design and produce building technology that is energy efficient or technology specifically created to save energy.

EE technology manufacturers An umbrella term for companies that produce either more efficient versions of common building technology and appliances or innovative technologies specifically designed to manage energy use.

Energy modelers Specialists, typically engineers, who use approved computer simulation software to estimate energy usage of a building or building plans.

Energy raters Certified specialists who use a combination of building documents, visual inspection, and tests to measure or validate the energy performance of a building.

Engineers Professionals who develop or assist with the design of mechanical, electrical, plumbing, structural and civil aspects of building.

Escrow agents Third party agents critical to the real estate transaction process in ensuring both parties fulfill obligations of the contract, including disclosure.

Facility managers Personnel responsible for the ongoing maintenance and efficiency of a building's operations.

Financial advisors Securities consultants who advise municipalities in the packaging and placement of financial instruments into the markets.

Green raters An accredited third-party professional who evaluates compliance of a building or maintenance processes to a green building rating system.

Home buyers Citizens, residents and investors looking for, evaluating or purchasing a new or existing home.

Home inspectors Professionals licensed by the Arizona Board of Technical Registration that evaluate the condition of a home.

Home sellers Citizens, residents and investors considering or in the process of selling an existing home. Homebuilders and their sales staff selling new homes are referred to as "Builders".

IFMA International Facility Management Association, a member organization of facility management professionals with two Arizona chapters. (ifma.org)

InterNACHI International Association of Certified Home Inspectors, one of two organizations representing home inspectors in Arizona. (nachi.org/AZ)

Landscape architects Professionals who impact energy usage through the use of shade, vegetative transpiration, permeable surfaces, as well as the reflectivity, emissivity and thermal mass of materials choices for the exterior surroundings of buildings.

Lenders Mortgage lending institutions.

Local governments County, city and/or town governments, or coalitions or associations of such governments.

Mortgage-backed securities owners Financial market actors who purchase bundled mortgages as financial instruments.

Multiple Listing Service boards Organizations typically consisting of realtors who govern the operations of a real estate multiple listing service for a geographic region.

NGOs Non-Governmental Organizations, an umbrella term indicating local community groups, neighborhood associations, environmental groups and/or other advocacy organizations.

RE Implementers Umbrella term indicating developers, designers, installers and integrators of commercial and residential renewable energy systems.

RE Lessors Organizations that finance and own renewable energy systems that are leased for use to residential and/or commercial customers.

RE Manufacturers Organizations that produce renewable energy systems or components.

Realtors Real estate sales professionals. New home sales agents employed by builders are included under the term "Builders".

Regional associations of government Regional organizations such as the Maricopa Association of Governments or Pima Association of Governments that facilitate cooperation among local governments.

Remodeling contractors Contractors who focus on traditional cosmetic or space alteration remodeling projects and who are not typically trained for home energy performance work.

Residential utility customers Utility customers purchasing energy from a utility under a residential rate plan.

RESNET Residential Energy Services Network, a non-profit organization that develops the Home Energy Rating Score (HERS) standard, procedures and accreditation requirements. (resnet.us)

RUCO Residential Utility Consumer Office, a State of Arizona entity led by a governor-appointed director, that advocates on behalf of residential customers in utility rate cases. (azruco.gov)

Sierra Club The Arizona chapter of a grassroots environmental organization and an intervener in utility rate cases. (arizona.sierraclub.org)

Social gaming providers Organizations that develop and provide interactive online entertainment for multi-player or play-er-comparison environments.

Software developers Entrepreneurs or established companies that write and publish computer applications for desktop or mobile devices.

Southwest Building Science Training Center A hands-on learning laboratory and classroom training facility for weatherization, energy efficiency and building science. (swbstc.org)

State Board of Appraisers A state agency charged with ensuring all Arizona appraisers meet the education, experience and examination criteria established by the Appraiser Qualifications Board of The Appraisal Foundation. (appraisal.state.az.us)

STB manufacturers Set-top box manufacturers, producers of cable, satellite and digital video recorder equipment for televisions, including multi-function videogaming equipment such as the XBox.

SWEEP Southwest Energy Efficiency Project, a non-profit energy efficiency advocacy organization and a frequent intervener in utility rate cases. (swenergy.org)

Tax equity investors Organizations that provide capital to pay for a portion of an energy efficiency or renewable energy project in exchange for revenue streams including tax credits and deductions that accrue, as well as other revenue streams.

Taxpayer interest groups A variety of NGOs that advocate on behalf of taxpayer interests. Examples include PIRG and the Goldwater Institute.

Television service providers Digital satellite, fiber-optic, and coaxial cable video entertainment operators.

Tenants Lessees of space in commercial buildings.

Third-party administrators Non-profit or for-profit organizations that manage the disbursement and collection of revenue associated with PACE-financed energy efficiency and renewable energy projects.

Title companies Companies that research, document and insure the chain of title on property deeds, as well as encumbrances on them.

University climatologists Researchers who analyze climate data, interactions and impact, including the urban heat island effect.

USGBC-AZ US Green Building Council - Arizona Chapter, a non-profit membership-based organization that promotes and advocates for green building. Has a Residential Green Building Committee. (usgbcaz.org)

Utilities Arizona's investor-owned, municipal and co-op utilities.

Workforce development candidates Applicants who qualify for grant-funded training assistance to re-tool their skills for positions that meet industry demand.

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