U.S. DEPARTMENT of ENERGY

How ESPC Can Drive Innovation and Economic Development in Your Community

March 10, 2026

A copy of the slides from today's presentation will be provided to you for reference.

ENERGY SERVICES COALITION
A Public Private Partnership
www.energyservicescoalition.org

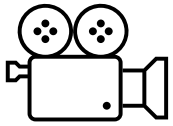
ESPC Campaign

Agenda

- Introductions
- About ESPC and Innovation
- Financial Innovation
- Network Innovation
- Technical Innovation
- Resources and Next Steps
- Q&A

Virtual Housekeeping

Drop your questions in the Q&A box



A recording of this training will be posted online

Introductions

Speakers

Chris Halpin, PE, CEM, CMVP, USDOE PF
Consultant
Energy Services Coalition
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Tony Gabriele
Director, Business Development
VOC Instrumentation
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Steve Alexander
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Speaker Bios

- **Chris Halpin** is the President of Celtic Energy, PLLC, based in Las Vegas, Nevada. He provides advisory services to organizations including ESC, the U.S. Department of Energy, and Lawrence Berkeley National Laboratory. Chris has more than 40 years of experience in the energy efficiency industry and previously founded and led an ESPC Owner's Representative firm for over 18 years, overseeing more than $2.5 billion in Energy Savings Performance Contract (ESPC) projects. He holds a B.S. in Mechanical Engineering, is a registered Professional Engineer in Nevada and Connecticut, and is certified by the Association of Energy Engineers as a Certified Energy Manager (CEM) and Certified Measurement & Verification Professional (CMVP). Chris is also a U.S. DOE FEMP-certified Project Facilitator and a nationally recognized speaker on ESPC and energy industry topics. ⚡
- **Steven Alexander** leads business development across North America for Blue Frontier and brings more than 20 years of experience in the utility and energy sector. Throughout his career, he has helped thousands of residential and commercial customers reduce energy consumption through comprehensive utility programs and efficiency measures. Steven has worked with major investor-owned utilities, municipal utilities, and cooperatives to expand energy programs from initial concept and design through regulatory compliance and reporting, achieving millions in energy savings. At Blue Frontier, he focuses on advancing new utility incentive structures and developing value streams for the company's liquid desiccant-based commercial air conditioning technology.
- **Tony Gabriele** has led business development and commercialization efforts for the VOC Instrumentation partnership since 2014. The U.S.-based venture focuses on bringing to market a next-generation air quality sensor originally developed for NASA and the International Space Station. Working with partners who bring decades of experience in HVAC markets and sensor engineering—including collaboration with the European Space Agency—Tony helps guide the strategy and market deployment of the technology. Prior to joining VOC Instrumentation, Tony spent many years managing global operations and strategic projects within the pharmaceutical and packaging industries, building expertise in technology commercialization and international project management.

About ESC

The Energy Services Coalition (ESC) is a national nonprofit organization composed of a network of experts from a wide range of organizations working together at the state and local level to increase energy efficiency and building upgrades through **E**nergy **S**avings **P**erformance **C**ontracting.

Local chapters; public and private sector individuals coming together to provide outreach and education.

Innovation

Innovation

Innovation is the **process** of translating new ideas, methods, or devices into usable, high-value products, services, or processes that improve upon the status quo.

It transforms creativity into actionable solutions that solve problems, enhance quality, or create market growth.

-Harvard

Invention vs Innovation

Invention is the creation of a new device, process, or product that did not previously exist, often resulting from study and experimentation.

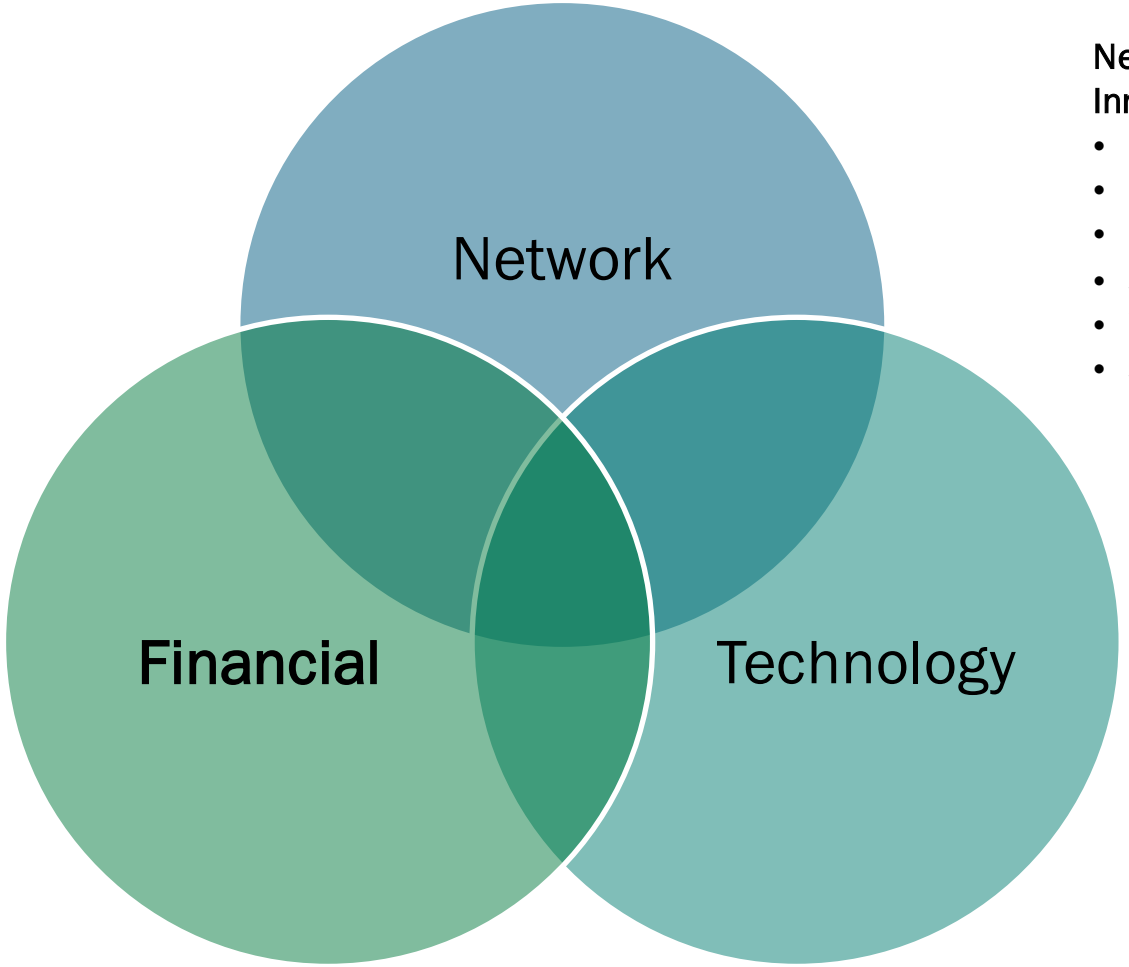
Innovation is defined as the introduction of something new or a change made to an existing product, idea, or field.

While invention creates something entirely new, innovation focuses on improving or adding value to existing concepts.

Merriam-Webster

Types of Innovation Made Possible Through ESPC

When used to its potential, ESPC can fuel all types of innovation for a community:



Network
Innovation around the way stakeholders engage

- Long-term public–private partnerships
- Utility aligned incentives
- Community engagement opportunity
- Student education
- Workforce development
- Stimulates local construction and engineering activity

Financial
Innovation around project funding and risk transfer

- Performance-based, third-party financing that pays from guaranteed savings
- Lifecycle cost optimization and budget stability
- Predictable budgeting over contract duration
- Performance risk transfer

Technology
Innovation around deployment and optimization of ECMs

- Deployment of advanced systems (electrification, storage, smart controls, microgrids)
- Whole-building and portfolio-level integration
- Energy, water, and infrastructure modernization

Energy Savings Performance Contracting (ESPC)
A Financial Innovation

ESPC: A Financial Innovation

"Financial systems exist to allocate capital and risk to those best able to bear it. Well-designed financial structures align incentives among investors, entrepreneurs, and institutions to support sustainable economic growth."

–Financing the Future by Franklin Allen and Glenn Yago

"ESPC is a financial mechanism used to pay for today's facility upgrades with tomorrow's energy savings – without tapping your organization's capital budget. Done properly, it has the performance of a hedge fund, with the risk of a T-bill."

- Chris Halpin

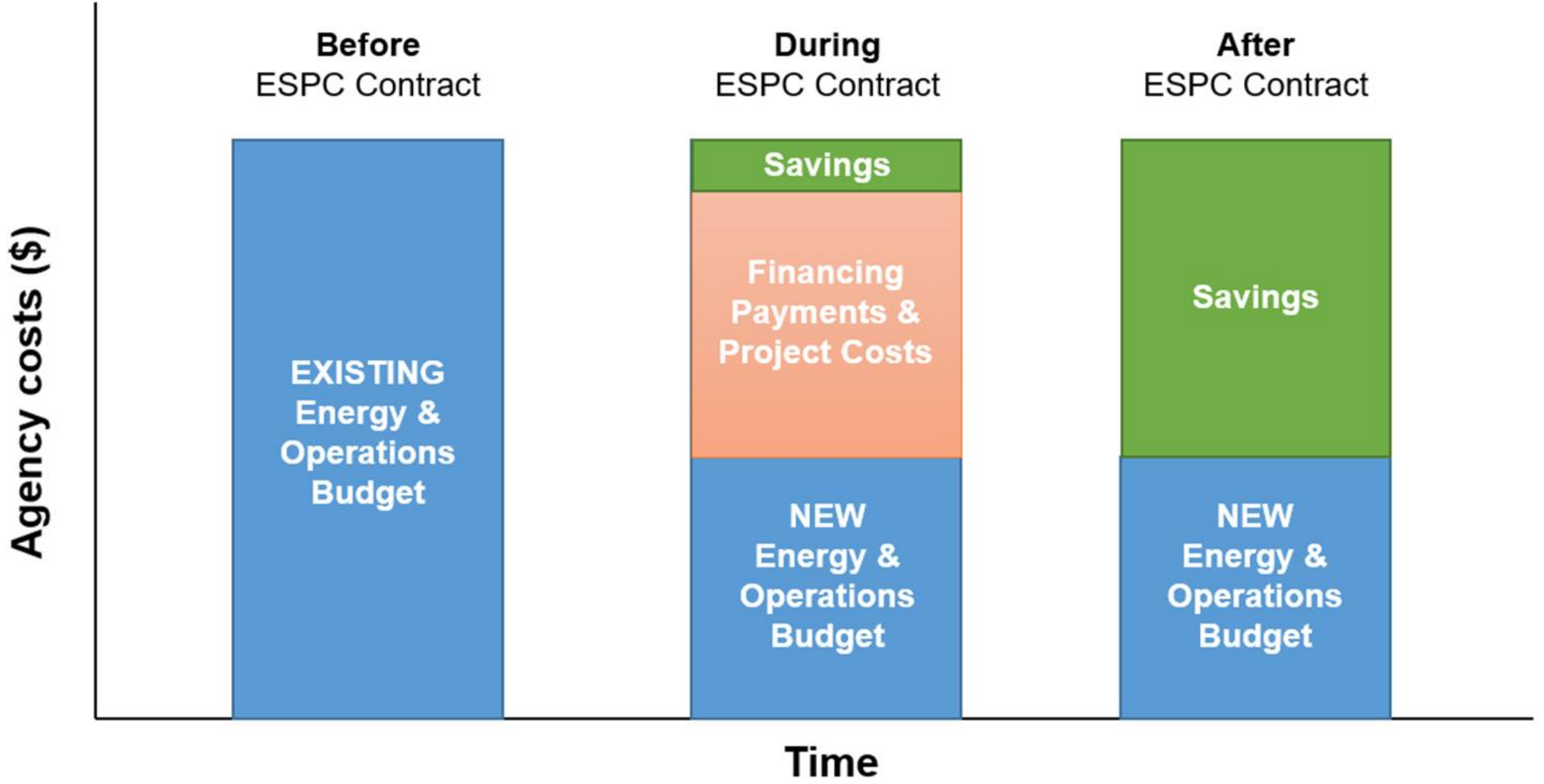
ESPC is "the use of guaranteed savings from the maintenance and operations budget (utilities) as capital to make needed upgrades and modernizations to your building environmental systems, financed over a specified period of time."

- United States Department of Energy – 1999

A version of **design-build** contracting, with a focus on guaranteed energy savings.

What is ESPC?

Budget Cost Neutral



Roots of Energy Savings Performance Contracting (ESPC)

ESPC projects emerged in the late 1970s–1980s in response to energy crises and aging public infrastructure to help **overcome barriers for Public Agencies:**

- Long procurement cycles
- Strict budgets
- Conservative fiscal cultures
- Risk Aversion

(Source: DOE Better Buildings Solution Center)

Benefits

Budget-Friendly Modernization:
Enables upgrades without new taxes or bond measures.

Job Creation:
Drives demand for skilled trades and technical jobs.

Guaranteed Results:
ESCOs assume performance risk through contractual savings guarantees.

Resilience:
Improves community resilience to climate impacts like power outages, floods, etc.

Operational Efficiency:
Reduces long-term costs, freeing up funds for core services and educational mission.

Improved Environments:
Enhances comfort, safety, and productivity, lowers emissions.

ESPC: A Resilient Model Over Time and Through Change

ESPC has proven resilient across:

- Fluctuating federal/state funding
- Political transitions
- Economic downturns

It has Bipartisan Appeal:

- Privately financed (does not require taxpayer dollars)
- Adopted in both red and blue states
- Supports local economies by engaging contractors and suppliers.
- Ensures transparency through rigorous Measurement & Verification (M&V)
- Reduces operating costs for public sector organizations with over-burdened budgets

Result:

- Over $30 billion in cost-effective upgrades financed through ESPCs across 45 states. Source

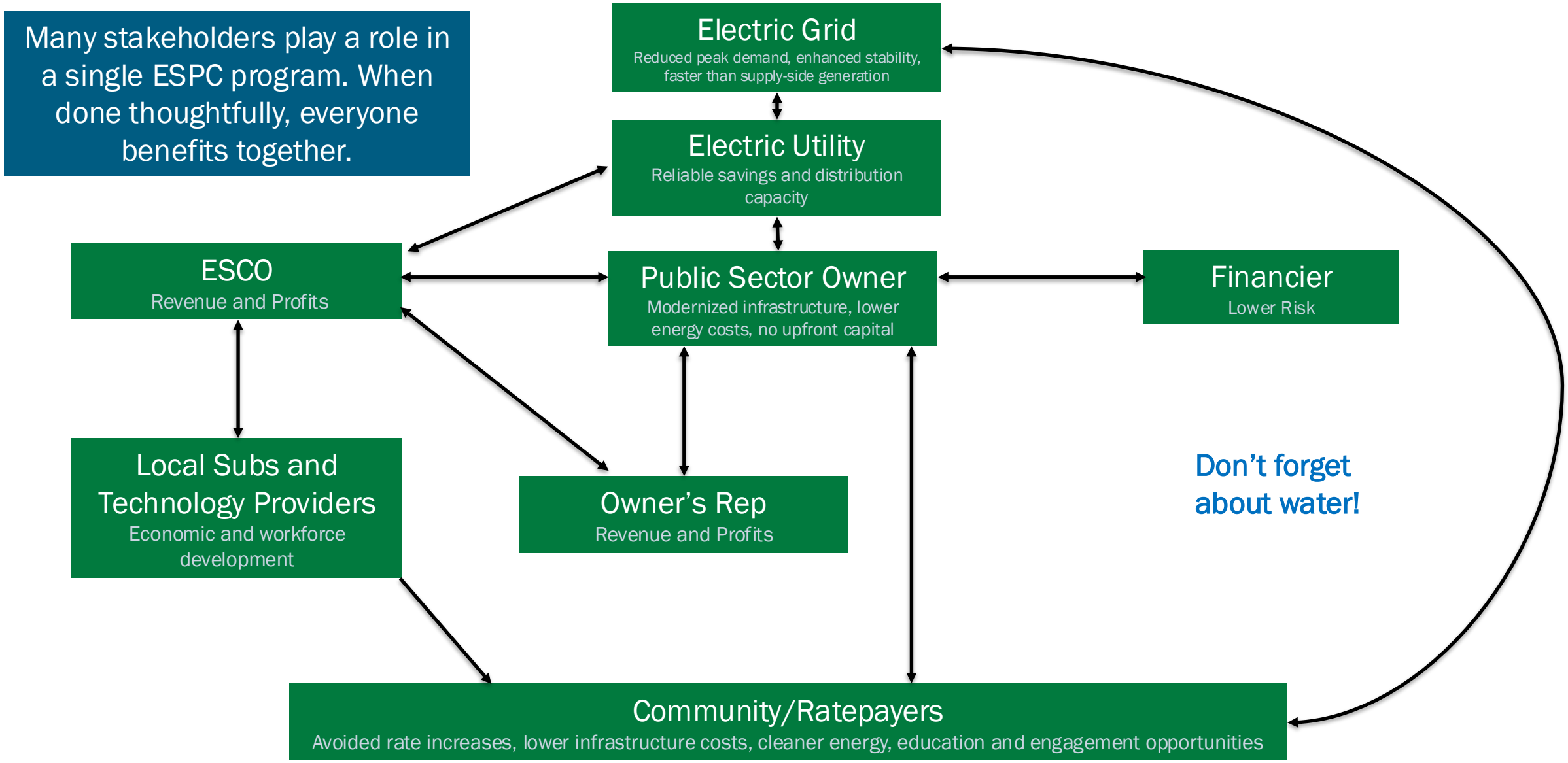
ESPC's budget-neutral structure and measurable results make it a politically neutral and fiscally responsible approach.

Network Innovation

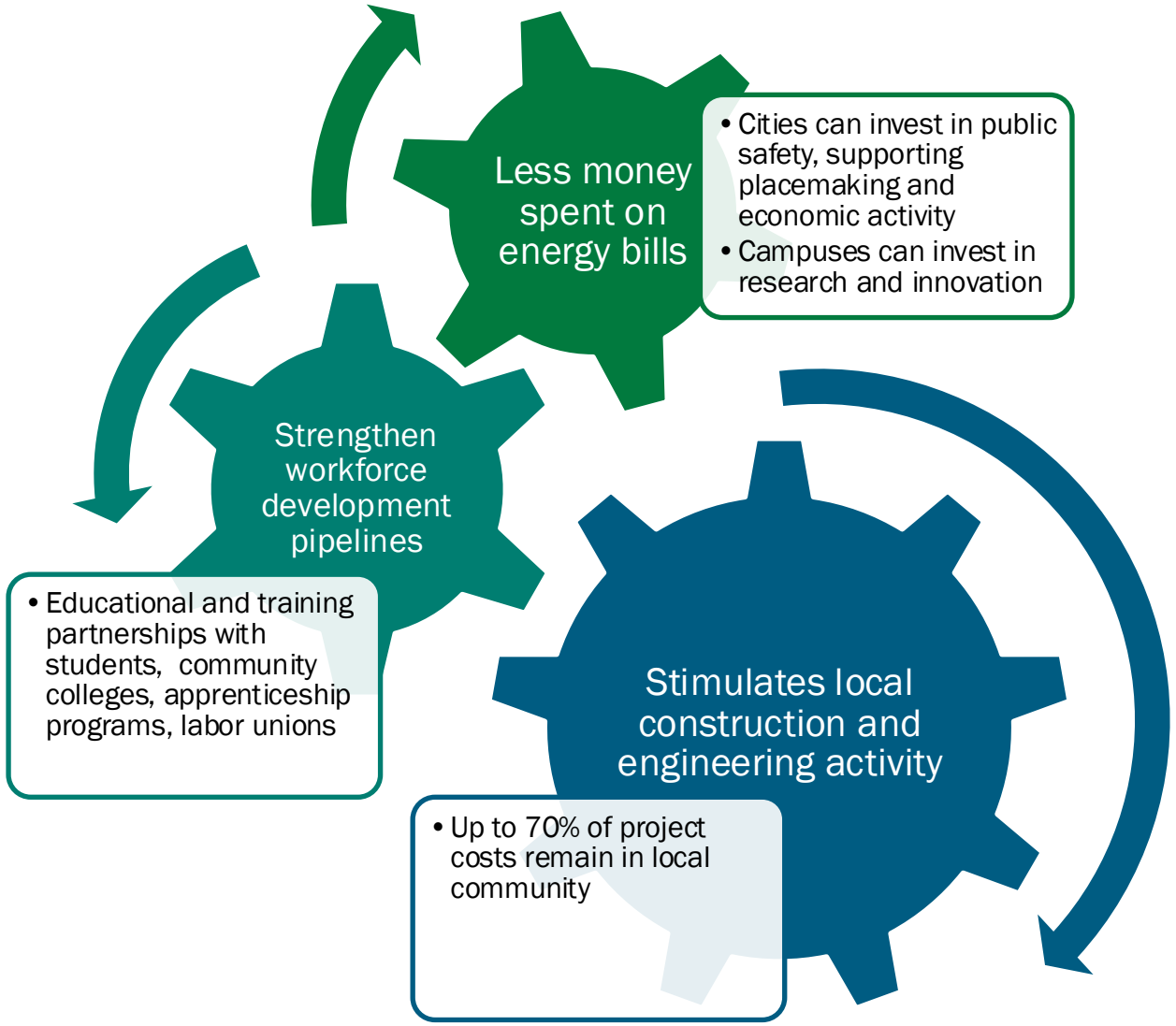
How does ESPC enable each party to leverage its strengths while distributing and reducing risk across all stakeholders?

The ESPC "Network"

Many stakeholders play a role in a single ESPC program. When done thoughtfully, everyone benefits together.



Economic Development through ESPC Networks



City of Durango, Colorado and Local Vendor Utilization

The project spans across 16 municipal buildings and 13 parks and supports the city's targets of a 25% reduction in energy use and an 18% reduction in interior water use by 2025, along with 50% renewable energy generation by 2030.

The total project cost approximately $5 million, with $1 million secured through a Colorado Department of Local Affairs grant. The remaining cost was financed by the City, with the project expected to pay for itself over a 16.2-year term through annual energy savings of $335,224 and operational savings of $11,483.

Through this project, $2.5 million was infused into community through local vendor utilization.

PROJECT SCOPE

- 1,819 LED lighting retrofits
- 213 water conservation retrofits
- 661kW solar capacity across five sites
- Rooftop unit replacements
- Pump control upgrades
- Building automation system upgrades and controls enhancements
- PowerED sustainability engagement program

INNOVATIVE FUNDING

- DOLA Grant: $1,000,000
- IRA Funding: $1,057,000
- Utility Incentives/Rebates: $101,114

CITY of DURANGO

McKinstry

Link to more information on this Case Study

City of La Crosse, Wisconsin and Community Engagement

- 13 Buildings addressed as part of project
- 800,000+ sq feet at City Hall, Libraries, Municipal Service Center, Stadium, Fire Stations, Parks, Street lighting and the La Crosse Center Construction
- Completion Year: 2026
- 4-Phase project, $11,173,635 implementation price for all phases

PROJECT SCOPE:
- Energy Demand Reduction
- LED Lighting
- HVAC
- Building Automation System (BAS) / Controls
- Boilers / Chillers
- Efficiency monitoring and reporting Renewable Energy Supply
- City-owned Solar Arrays: seven (7) locations totaling over 0.5 MW

INNOVATIVE FUNDING:
- Tax Exempt Lease Purchase
- Bond
- Utility rebates (Xcel Energy)
- Focus on Energy (Utility program)

LA CROSSE WISCONSIN

Schneider Electric

INNOVATIVE COMMUNITY ENGAGEMENT OPPORTUNITY:
A public dashboard was installed at the library to promote community awareness and education of solar generation.

Link to more information on this Case Study

Clark County School District, NV and Sustainability Education for Students

Clark County School District, serving Las Vegas and the surrounding area, is one of the largest school districts in the nation. Rising energy costs, a backlog of deferred maintenance, and sustainability goals necessitated a district need for a comprehensive facility investment strategy. This project will achieve economic, environmental, resiliency, comfort, safety, and deferred maintenance goals. It facilitates scalable future growth and technology implementation for the District and will improve the learning environment for students and faculty, emphasizing sustainability and long-term efficiency, and deliver guaranteed operational savings to the District.

PROJECT SCOPE:

- Safety Improvements, user friendly, wireless control and increased long-term controllability for:
  - LED Lighting
  - Building Automation Systems / Controls
  - Dwell time adjustments
  - Motion activation
  - Daylight Harvesting
- Waste management/efficiency analysis to reduce waste in materials, storage, and transit miles
- Futureproofing
  - To reduce need for rework of an additional ESPC by deploying BACnet
  - To expand into HVAC and renewable energy in later phases of work
- 276 Local Subcontractors Engaged, >40% Subcontractors are MWBE

This project hosted students and faculty events such as Behind the Scenes Sphere Tour and Career Tech (CTE) Sustainability workshops.

WILLDAN

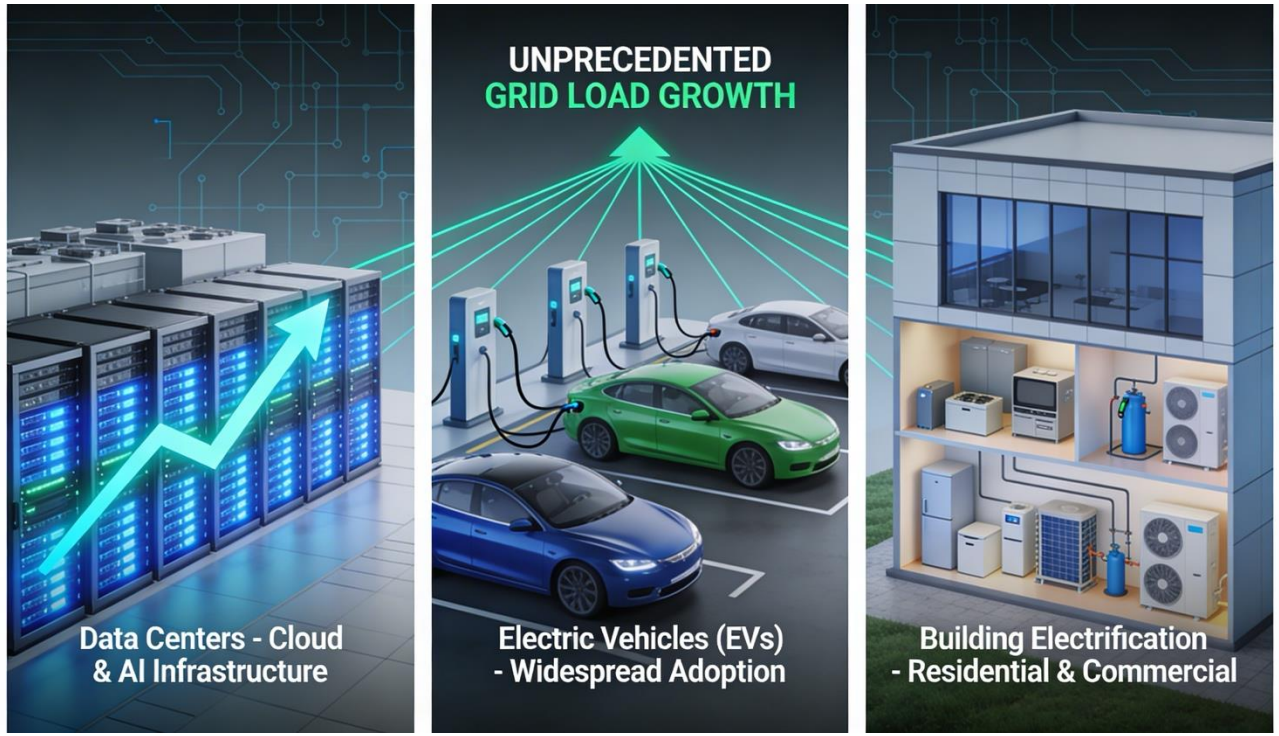
NV5

Link to more information on this Case Study

The Grid Challenge We Face

ACEEE Report: Faster and Cheaper: Demand-Side Solutions for Rapid Load Growth[1]

- Electricity demand expected to grow 25% by 2030 ***(Traditionally ~1%/year)***
- Data centers, EVs, and electrification driving growth
- Utilities defaulting to new natural gas generation
- Grid infrastructure costs rising 30%+ since 2003



1- Specian, Mike, and Alex Aquino. 2026. Faster and Cheaper: Demand-Side Solutions for Rapid Load Growth. Washington, DC: ACEEE. aceee.org/research-report/u2601.

Energy Efficiency through ESPC is Fastest & Cheapest Solution

Efficiency has always been the "First Fuel" for many reasons:

- Considerably less expensive than any supply side option by a factor of 2x-100x
- Faster due to avoiding cost, siting, environmental compliance, emissions, and delays of generation, transmission, distribution (**NIMBY doesn't exist for EE!!**)
- Creates 2x-7X more local jobs per MW delivered than any supply side option[2]
- Utilities have delivered EE programs for decades
- ESPC "guaranteed savings" model perfect match for utility's "persistence of savings"

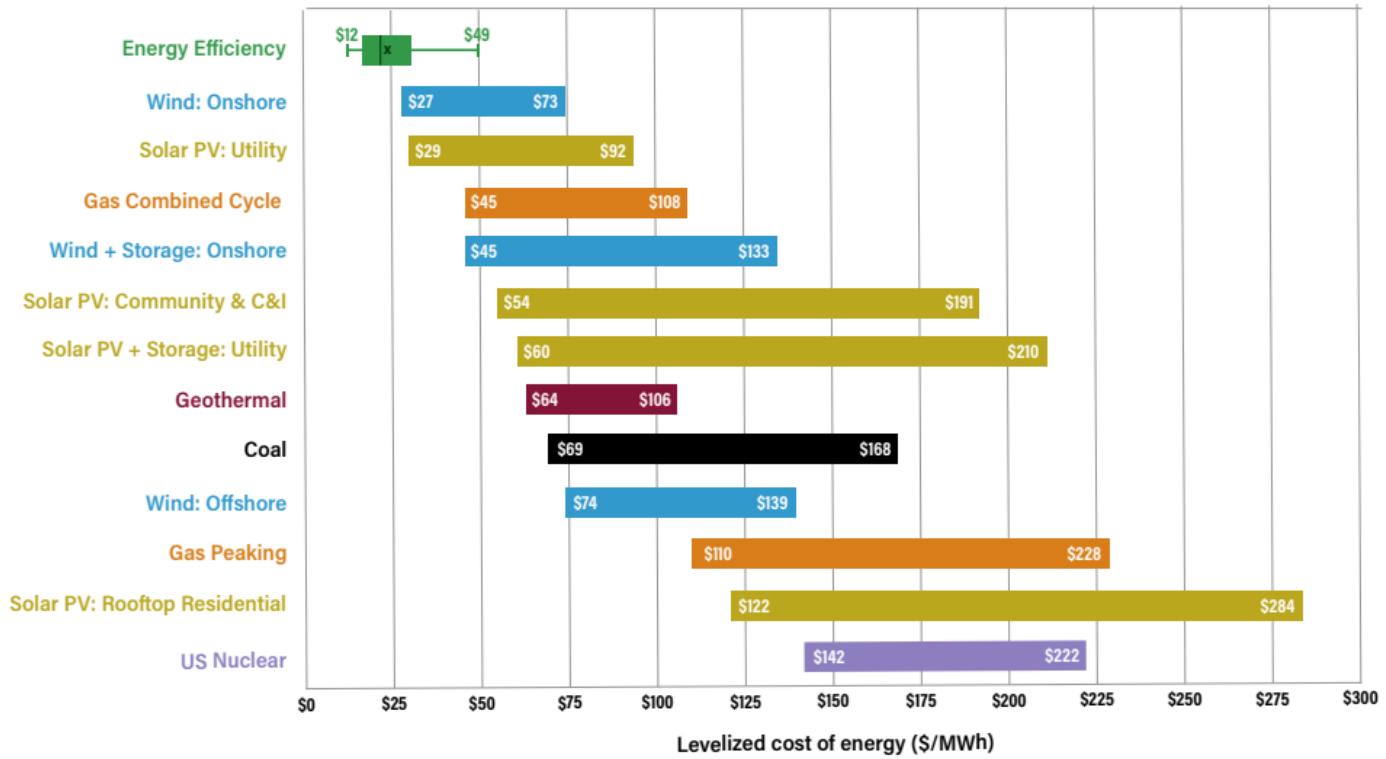


Figure ES-1. A comparison of the levelized cost of energy efficiency and supply-side resources. Vertical line and "X" represent the median and mean costs of energy efficiency, respectively. Cost data for supply-side resources calculated by Lazard (2024).

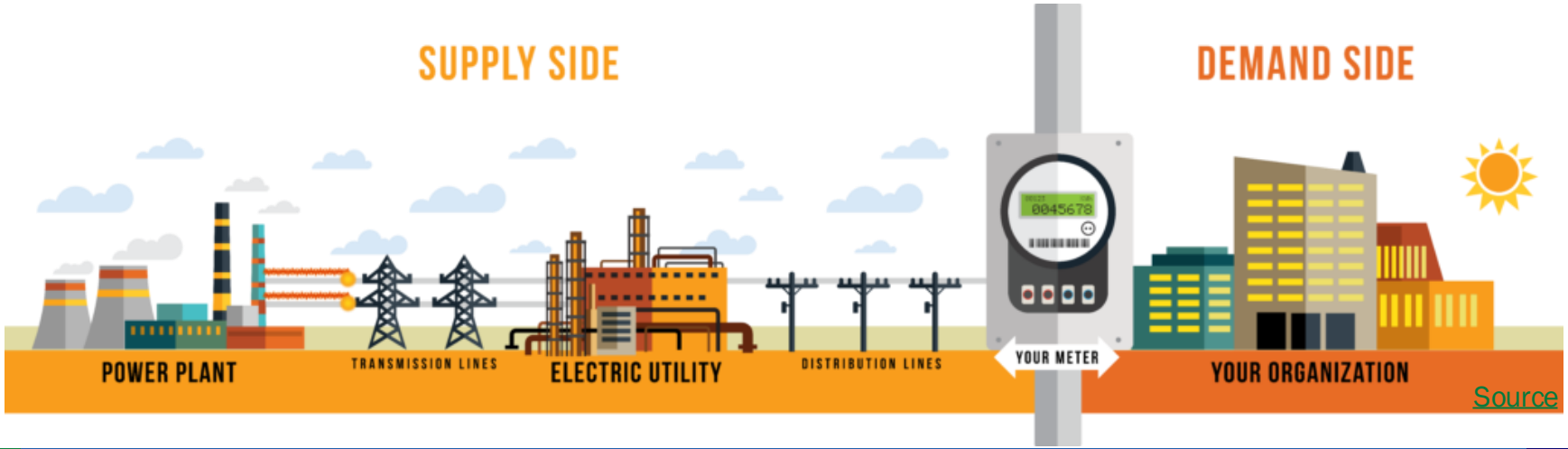
Courtesy of ACEEE[1]

1 - Specian, Mike, and Alex Aquino. 2026. Faster and Cheaper: Demand-Side Solutions for Rapid Load Growth. Washington, DC: ACEEE. aceee.org/research-report/u2601.
2 – ACEEE – How Does Energy Efficiency Create Jobs? factsheet

Demand Side Management

"Energy efficiency and load flexibility have enough untapped potential nationally to significantly offset the unprecedented forecasted load growth (i.e., electricity consumption and peak demand) driven by data centers, industry, and the electrification of transportation and buildings."

- Improve efficiency and flexible energy use before connecting new systems to the grid (e.g., solar PV).
- Work with utilities and energy experts early to identify ways your facilities can reduce or shift electricity use and take full advantage of **Demand Side Management (DSM)** opportunities.
- Push for recognition of load reductions created by new DSM investments, including credit or compensation for reductions supported by utility programs. (DSIRE) Some **RTOs/ISOs** pay for flex-loads
- Although savings from **Demand Response (DR)** aren't typically guaranteed by ESCOs, they can install the technology, and the Owner can hire a **Curtailment Service Provider (CSP)** to manage the program.



How does ESPC facilitate integration and optimization of ECMs?

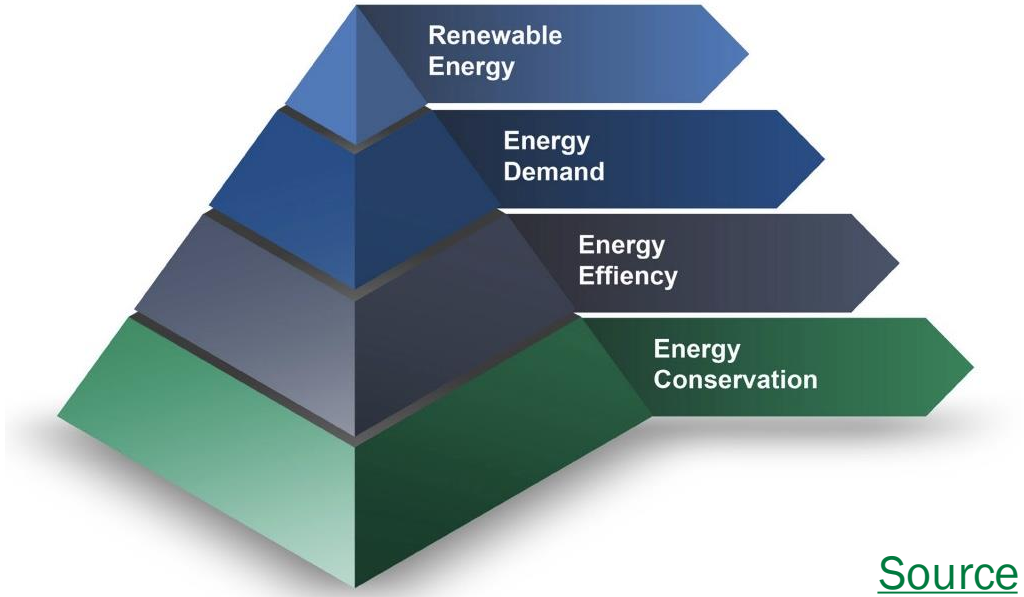
Technology Innovation

Technology Innovation through ESPC

- **Risk-Shift Enables Adoption:** Performance guarantees reduce owner risk, enabling deployment of advanced and emerging technologies.

- **Whole-System Optimization:** ESPC bundles measures across systems, encouraging integrated, portfolio-level modernization rather than isolated upgrades.

- **Financeable Operational Innovation:** Accountability through measurable outcomes, since the project must perform over time. This drives data transparency, ongoing verification, and continuous optimization.



Source

"Energy efficiency and load flexibility have enough untapped potential nationally to significantly offset the unprecedented forecasted load growth (i.e., electricity consumption and peak demand) driven by data centers, industry, and the electrification of transportation and buildings."

Technology Example

Liquid Desiccant Based Cooling: Decouples refrigerant from the air stream, allowing separate humidity and temperature control, increasing HVAC and building efficiency

Creates unique community value through air conditioning providing a strong ESPC measure model.

BLUE FRONTIER – LIQUID DESICCANT BASED COOLING

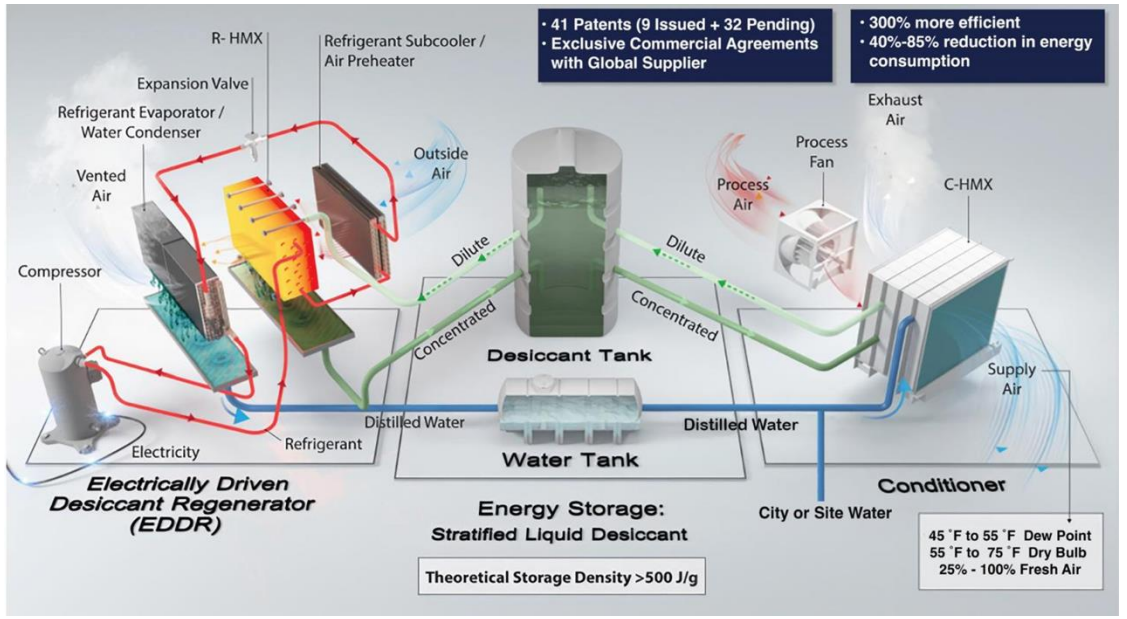
- BFAC leveraged U.S. government–funded NREL technology to develop a commercial product that addresses the growing demand for air conditioning while strengthening grid resilience amid the rapid expansion of data center, electrification, and EV loads. As capacity becomes more constrained, Blue Frontier provides 20 tons of full load cooling with less than 2kW while providing load flexibility and resiliency.

- Solar production and waste heat can be utilized to re-concentrate the liquid desiccant, which further increases its efficiency. Air source heat pump efficiency increases with hotter ambient conditions.

- **Blue Frontier decouples refrigerant from the air stream and allows separate humidity and temperature control**

- Liquid desiccant tank provides energy storage, qualifies for 30% tax credit like battery technology, and each system is digitally twinned enabling aggregated, controllable capacity

Breakthrough Energy VENTURES · FLORIDA OPPORTUNITY FUND · 2150 · VoLo Earth VENTURES · DeepWork CAPITAL



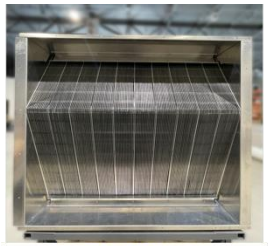
BLUE FRONTIER – LIQUID DESICCANT BASED COOLING

- Liquid desiccants have historically been corrosive and not environmentally friendly. Blue Frontier conditioning utilizes non-corrosive, non-toxic, stable salt based liquid desiccant for dehumidification and low flow water for indirect evaporative cooling

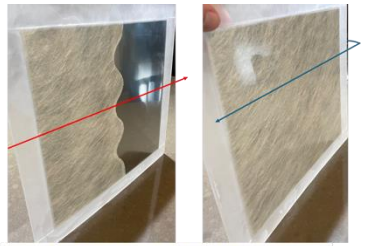
- Blue Frontier liquid desiccant is gravity fed into a wick attached to a series of stainless plates with one side dehumidifying and the opposing side providing indirect evaporative cooling in a counterflow heat exchanger.

- **Dehumidified / Cooled air is supplied into building directly or into RTUs at the same achievable dew point and dry bulb as a DX system with 40-80% less energy consumption and 95% peak load reduction for 4-6 hours due to its compressor-less conditioner core and 250-gallon desiccant cooling storage tank.**

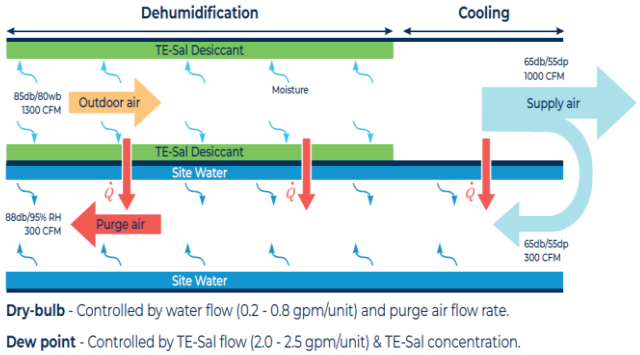
- Dilute desiccant is pumped to the electrically-driven desiccant regenerator. Using a heat pump, desiccant is heated to 145 deg. F re-concentrating the desiccant for use again. Desiccant never has to be replenished or replaced.



FLAT PLATE HEAT EXCHANGER



METAL PLATES AND POLYMER WICKS



Dry-bulb - Controlled by water flow (0.2 - 0.8 gpm/unit) and purge air flow rate.

Dew point - Controlled by TE-Sal flow (2.0 - 2.5 gpm/unit) & TE-Sal concentration.

WHAT IF...

- Data Center load growth could triple to 106 GW by 2035 rejecting 2.9 Quads of heat
- Data Center is cooled through liquid desiccant regeneration dramatically reducing data center cooling energy consumption
- Concentrated liquid desiccant is stored in tanks that store cooling potential at sites, acting as batteries
- System can run on electricity or be fed with distributed liquid desiccant networks
- Systems provide cooling and dehumidification with little to no electricity consumption

This is the future of Air Conditioning.

Blue Frontier is leading the way.

Technology Example

Smart Air.
Smarter Buildings.

How multi-parameter air quality sensing simultaneously reduces energy costs and transforms indoor environments, from space technology to commercial reality.

THE PROBLEM:
Buildings waste energy while occupants breathe polluted air. Conventional systems miss both.

Energy Waste

40–60% of a building's energy bill is HVAC

Most HVAC systems run on fixed schedules based on worst-case occupancy — delivering the same conditioned airflow at 2AM as at peak capacity.

Over-ventilation can reach

6× minimum requirements

— U.S. Dept. of Energy

Indoor Air Quality Crisis

3.8M premature deaths annually — WHO

CO_2-only sensors miss:

- VOCs from building materials & cleaning products
- PM1, PM2.5 & PM10 particulate matter
- Airborne pathogens
- Outdoor pollution infiltration events

PROSENSE SENSOR PLATFORM

What makes ProSense different from conventional monitoring devices?

What's different about Airgloss ProSense?

SPACE TECHNOLOGY

Airgloss technology was initially developed for space (NASA project) and validated by ESA (ESA Space Solutions)

PROPRIETARY TECHNOLOGY

ProSense doesn't use any off-the-shelf sensing units, but a proprietary MEMs sensor array with A.I. and Pattern Recognition.

HVAC CONTROL

ProSense can autonomously control existing HVAC systems based on the actual needs of the environment.

REAL TIME

ProSense monitoring is completely real time, allowing accurate reports and historical data.

ENERGY SAVING

ProSense also helps save energy by activating heating, cooling and ventilation systems when and how they're needed.

PARAMETERS MONITORED

ProSense is one of the most comprehensive solutions on the market, parameters wise.

INTUITIVE INTERFACE

Airgloss Dashboard is available both for web and mobile, easy to use for professional as well as unskilled users.

airgloss

The Technology
From the International Space Station to your building

Originally developed for NASA & the European Space Agency — tested on the International Space Station — developed by Airgloss, Rome, Italy.

CO_2-Only DCV (Conventional)

- Monitors occupancy via CO_2 only
- Blind to VOCs & building material off-gassing
- Misses airborne pathogens
- Cannot respond to outdoor pollution events
- Improvement vs. fixed-schedule — but incomplete

MultiSensing Smart DCV (Airgloss)

- CO_2 + VOCs + PM1/2.5/10 + Temp/Humidity
- Optional: NO_2, CO, O_3, H_2S, SO_2, Formaldehyde
- AI interprets combined multi-sensor signals
- Refrigerant leak detection (S-NDIR, SIL2/ATEX)
- Indoor, outdoor & industrial configurations

THE ENERGY CASE
Independent research proves the savings, and Smart DCV maximizes them

17.8%

avg. HVAC savings

U.S. Dept. of Energy
across all climate zones

35–38%

avg. commercial building

Meta-analysis cited
by Vaisala / DOE

Up to 78%

vs. fixed ventilation

Smart DCV with
CO_2 + VOC + AI

What determines your savings?

Baseline over-ventilation

Up to 6× the required minimum — the higher, the greater the potential gain

Occupancy variability

Schools, conference centers & theaters see the greatest savings

Climate zone

Cold & hot climates spend more energy conditioning outdoor air

Sensing sophistication

Multi-parameter + AI captures more opportunities than CO_2 alone

Resources and Upcoming Events

Consider Technical Assistance

State and local ESPC Campaign partners are invited to set up a time to speak with an ESPC Subject Matter Expert for direct technical assistance. Discussion topics can be anything regarding an ESPC project or program, including specific questions on your project. **To request a meeting time,** please email espccampaign@hq.doe.gov .

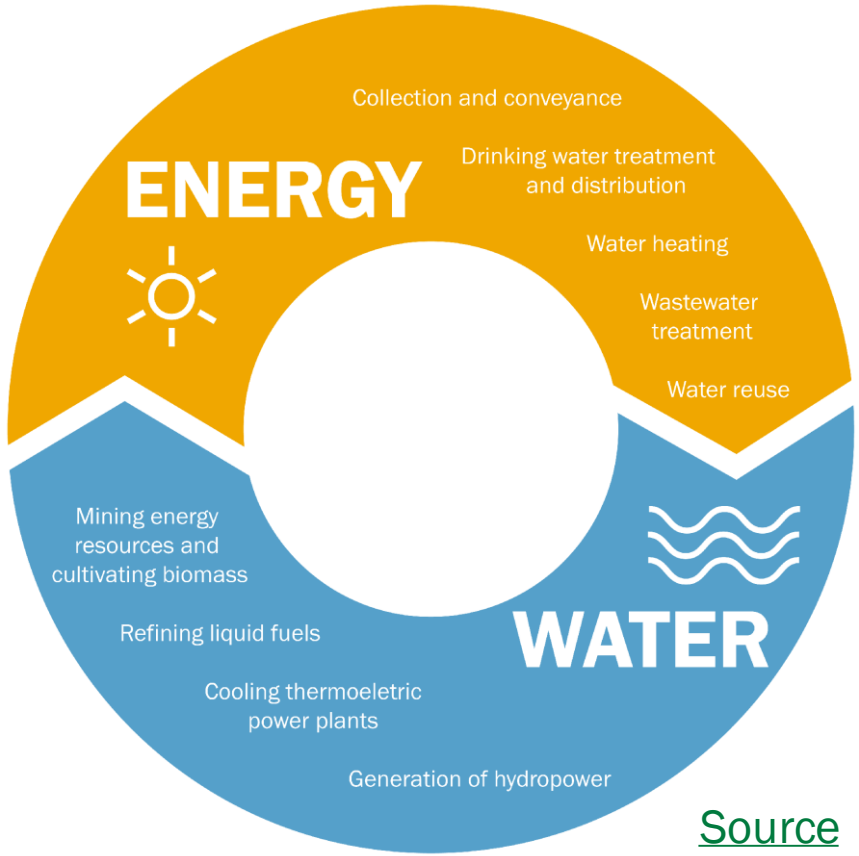
"The ESPC Campaign and ESC are providing technical assistance as we explore how energy performance contracting can address the unique needs of schools across the islands, from deferred maintenance to solar and energy efficiency investments that advance the State's clean energy targets in an economically feasible way. This work centers the Department of Education's commitments to equity and education and is helping Hawai'i DOE build a strong, coordinated foundation for moving forward."

-Ryan Hee Wai, Energy Engineer, Hawai'i Department of Education

Upcoming Event

Modernizing Water Infrastructure with ESPC: Solutions for the Water-Energy Nexus

April 14, 2026, 11:00am-12:00pm PST



Source

Relevant Past ESPC Campaign Events

Training 01: Intro to ESPC - A High Value Tool for Public Agencies

Training 06: Maximize Your ESPC Success – Review and Apply Lessons Learned

Webinar: ESPC Resource Tour

Understanding the “One Big Beautiful Bill Act” and What It Means for ESPC Funding

Collaborative Energy Solutions: Multi-Agency ESPC Success NC Department of Adult Corrections

Q&A

U.S. DEPARTMENT of ENERGY

ENERGY SERVICES COALITION
A Public Private Partnership

Thank you!

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ESPC Campaign