CONSERVATION IN PRACTICE: ENERGY & WATER STRATEGIES FOR TEXAS

CAPCOG & SPEER

August 11, 2026

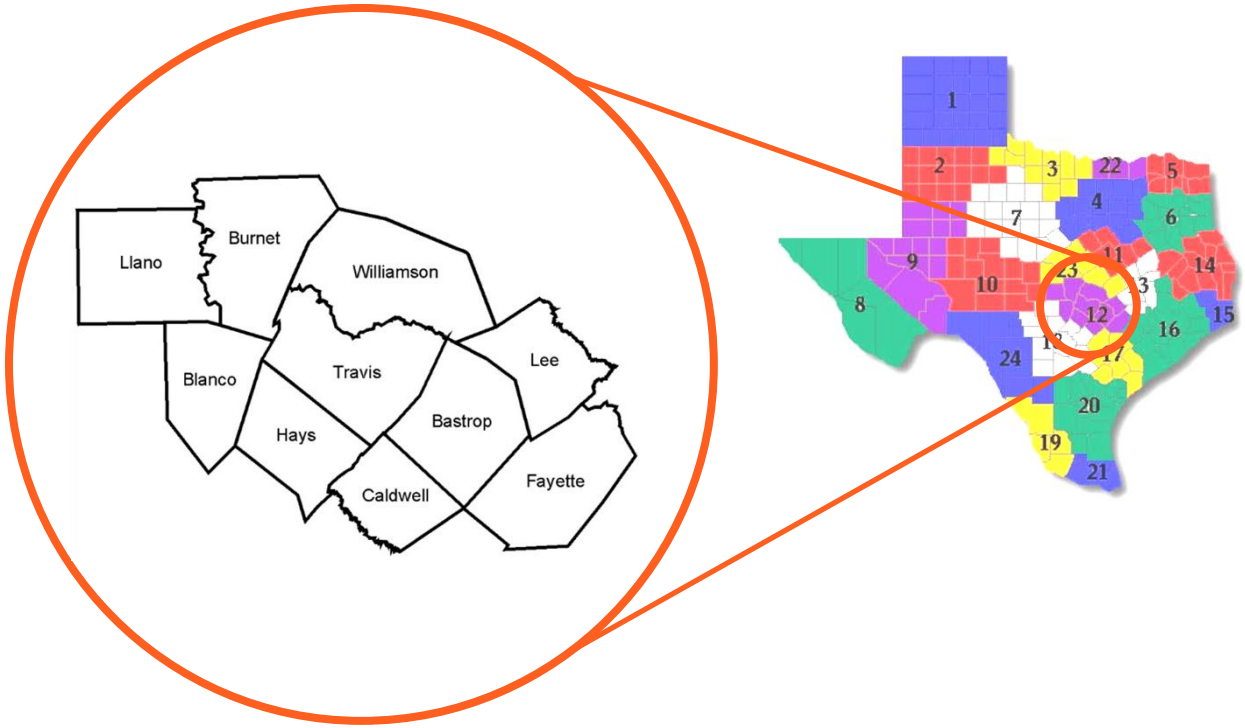
Powering Texas Energy Strategies: Summer Workshop Series

August 25th:

Community Input, Practical Impact – Balancing Data Center Growth with Community Needs

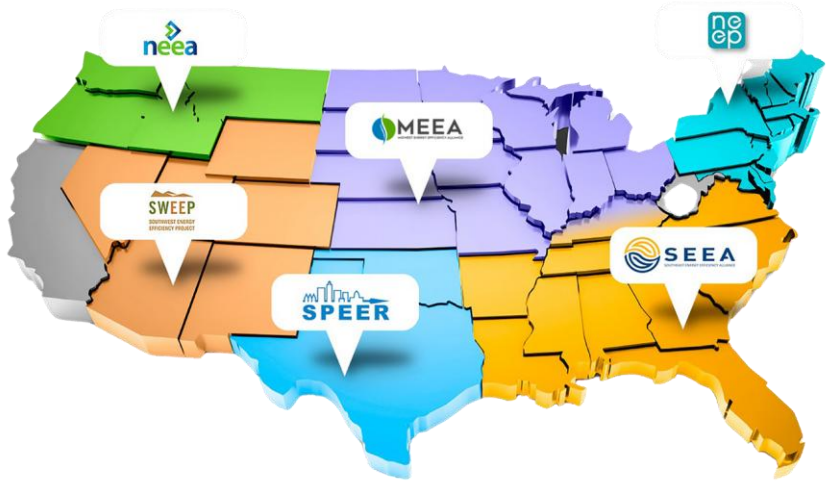
CAPCOG – Regional Planning Commission in Statute; more often called a COG.

- Emergency Communications 9-1-1
- Area Agency on Aging/Aging & Disability Resource Center
- Homeland Security Planning & Training
- Regional Law Enforcement Academy
- **Air Quality Planning**
- Solid Waste Planning
- Economic Development Analysis & Technical Assistance
- Transportation Planning



Who is SPEER?

- REEO: Regional Energy Efficiency Organization
- **Member-based**, non-profit 501(c)3 organization
- **65+ members** from a wide cross section of Energy Efficiency Industries
- Focused on Outreach Education and Collaboration on **Clean Energy**



SPEER
The South-central Partnership for Energy Efficiency as a Resource

SPEER Energy Codes Program

Supporting Better Buildings through Education, Training & Technical Assistance

SPEER helps communities, code officials, builders, designers, and industry professionals successfully adopt and implement modern building energy codes across Texas and Oklahoma. Our goal is to improve energy efficiency while creating buildings that are more comfortable, durable, healthy, and affordable to own and operate

Energy Code Ambassador Program

Local Experts. Statewide Impact

SPEER operates the largest Energy Code Ambassador network in the US, recognized by the ICC. Energy Code Ambassadors are experienced building energy efficiency professionals who receive advanced training and serve as a local resource by providing peer-to-peer support, practical guidance, and real-world solutions for energy code implementation. The program is conducted in partnership with ICC, SECO, and BCAP

Randy Plumlee / rplumlee@eepartnership.org

Housekeeping

- Questions are welcome in the chat or Q & A
- Recording of the workshop will be posted on the SPEER YouTube Channel
- Presentation will be provided in follow-up email

Agenda

- Arrival, Welcome & Breakfast, 9:00 am – 9:20 am
- Wilkerson Center Tour, 9:30 am – 9:55 am
- 5-Minute Break
- Austin Energy Presentation, 10:00 am – 10:15 am
- Colorado River Alliance Presentation, 10:15 am – 10:30 am
- Houston Advanced Research Center (HARC) Presentation, 10:30 am – 10:45 am
- Panel Discussion, 10:45 am – 11:15 am
- Closing Remarks

We'll Be Right Back

At 10:00 am

Presenters

Austin Energy

Amy Atchley,
EV Equity Development Manager

Colorado River Alliance

Adrienne Longenecker, CFRE
Executive Director

HARC

Margaret Cook, PhD
Vice President, Water & Community Resilience

Drive Electric Today Build a Better Tomorrow

Amy Atchley

EV Equity Development Manager

Electric Vehicles and Emerging Technologies

Austin Energy

August 11, 2026

Net-Zero

Austin's CO_2 Emissions by 2040

= 40% vehicle miles are electric by 2030

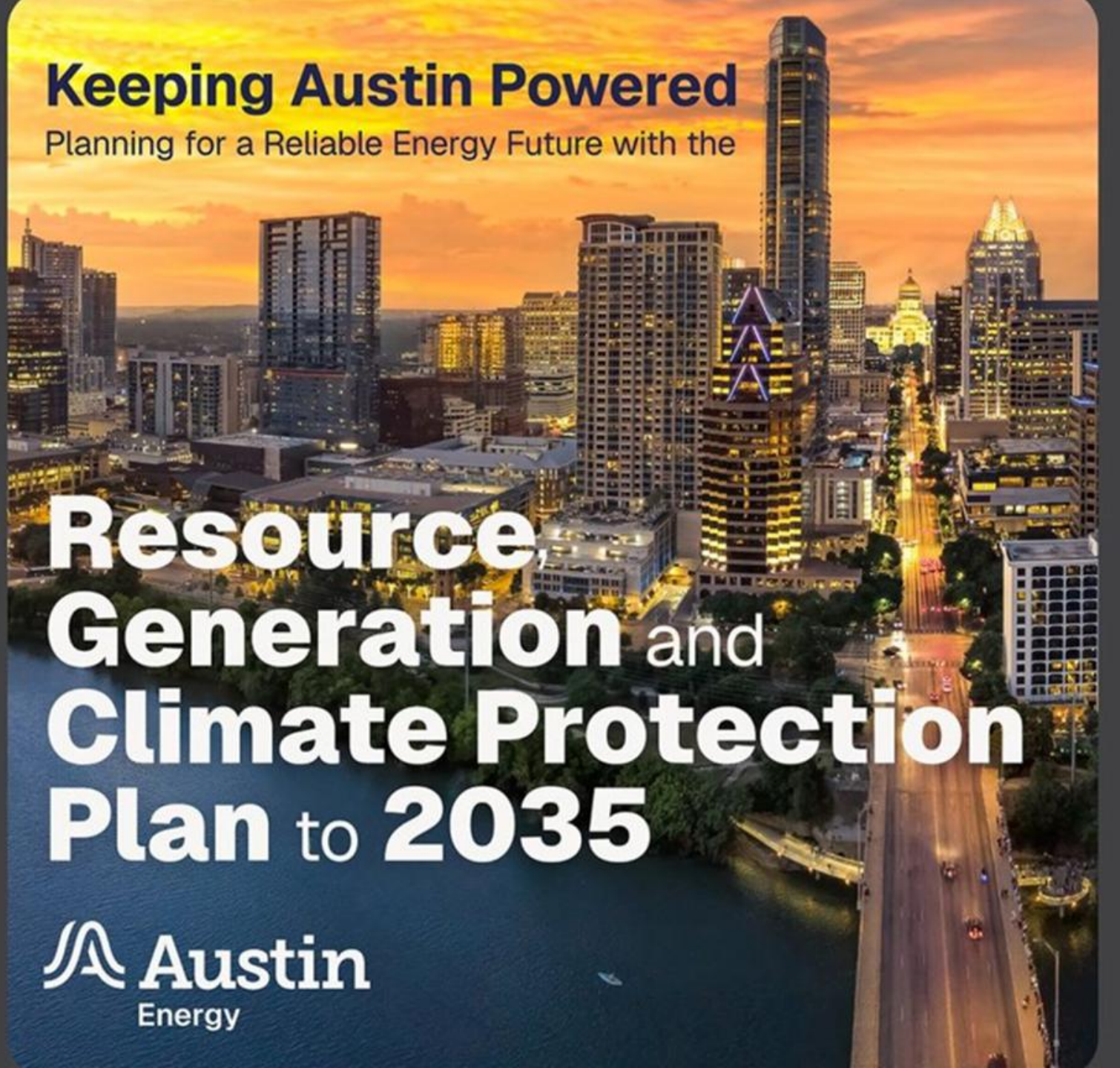
Austin Energy

Resilience

A flexible path to a clean energy future that incorporates our community's core values of:

- Reliability
- Affordability
- Environmental Sustainability
- Energy Equity

Austin Energy



Environmental Excellence

Tracking to carbon free generation by 2035 – Today 70%+ renewable energy

Wind

Solar

Biomass

Austin Energy's Five Pillar Strategy

Austin Energy

Charging Infrastructure

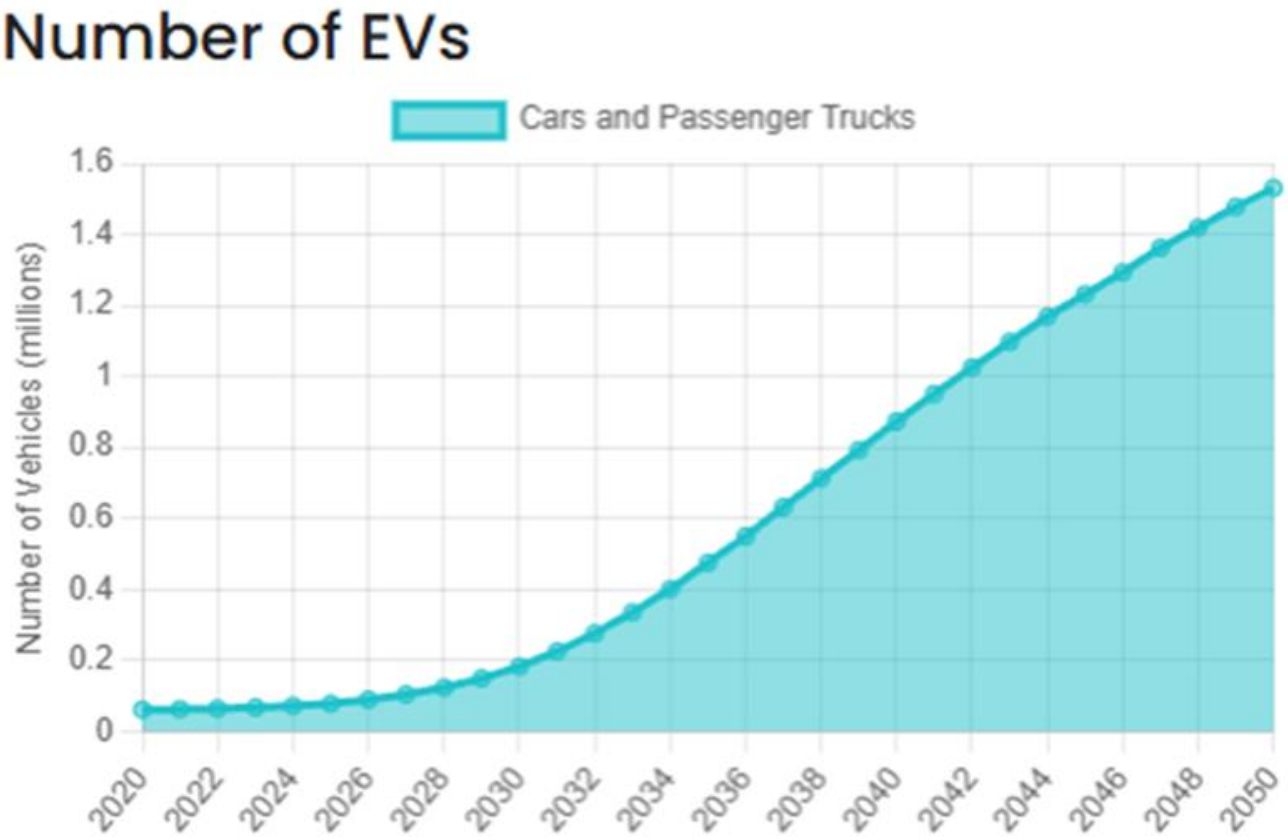
Equity & Affordability

Fleets & New Mobility

Outreach & Education

Grid Integration

EVs in Austin



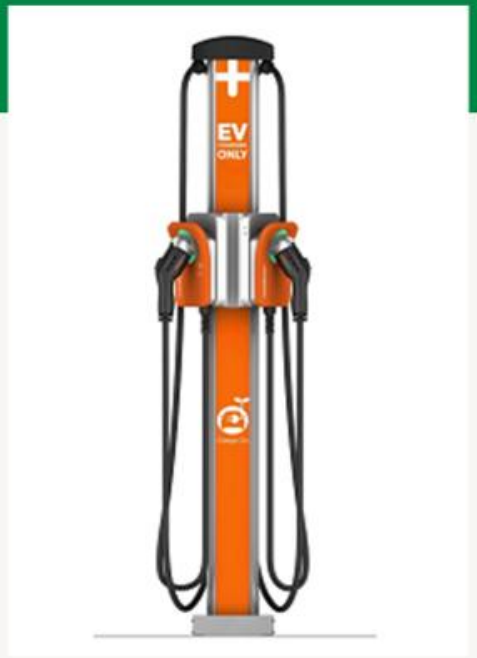
13% of new vehicle registrations = tipping point to mainstream adoption

Austin Energy

Types of EV Charging

Regular Wall Outlet

Electric output: 120v
Charging time = overnight



Level 2 Charger

Electric output: 240v
Charging time = hours

Fast Charger

Electric output: 400v
Charging time = minutes

80% of electric vehicle drivers prefer to charge at home regular outlet or (Level 2)

Public network

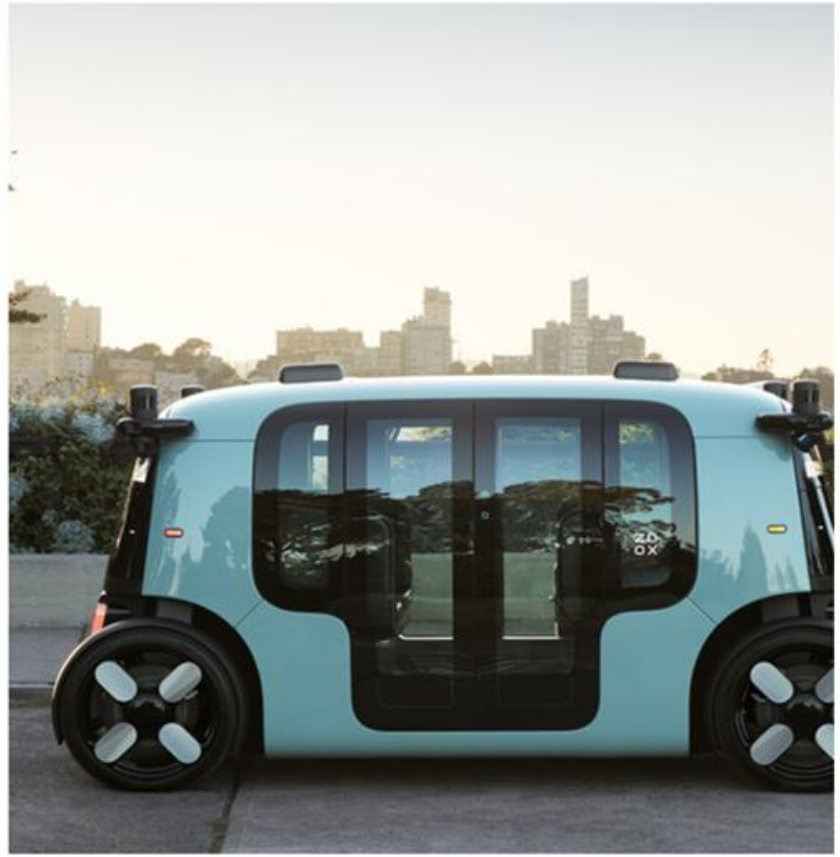
- Level 2 1400+ ports
- Fast Charging 30 stations

Austin Energy

City Progress

City Fleet 450 transitioned to electric with more on the way

Private & public commercial fleet for delivery/rideshare/AVs = 600+Fast Chargers



New Electric Mobility Around Austin

Electric Drive Showcase

The Ivory Condos at Chicon

Austin's First eMobility Hub

A model of sustainability where home ownership intersects with new, clean mobility options

53 units

- Community EV carshare
- City eBike share system
- New high frequency bus stop added
- Secure personal bike storage
- Solar coverage for ~90% of owner's electric usage
- Workforce housing units are available to purchase for those make < <70% MFI

Austin Energy

EVs for Schools

Inspiring a new generation of sustainability leaders

EV Curriculum + Infrastructure

Lessons launched in 4 Title 1 schools in Austin and now are in **150** classrooms in Central TX and expanding across the U.S. Local results: reaching **20,000+ students**

Youth Leadership Development

Cohorts of college fellows for deep dive discussions on the future of clean energy and transportation electrification and their role in it

High Impact Workshops

1500+ students experienced EV workshops with Virtual Reality, EV demos and more as part of field trip adventures

Austin Energy

Austin Energy + Austin FC = Winning Team

New partnership launches to connect sustainability with community-wide outreach and engagement!

EV Charging I Sustainable Transportation I Zero Waste I Water Conservation I Sustainable Education

Austin Energy

AUSTIN

Q2 STADIUM

Future Forward Technology

Managed Charging

Customers are active partners and collaborators in energy resilience and climate protection.

Vehicle to Home (V2H)

EV supplies power directly to a home, providing backup electricity during outages or helping manage energy use when grid power is limited.

Vehicle to Grid (V2G)

EVs send stored energy back to the electric grid when needed, helping support reliability, balance demand, and strengthen the energy system.

Austin Energy

Austin Energy

From Field Trip to Stewardship:
Inspiring Future Generations of River Heroes

COLORADO RIVER ALLIANCE

Adrienne Longenecker
Executive Director

OUR VISION

A day when the Texas Colorado River is valued and protected by all.

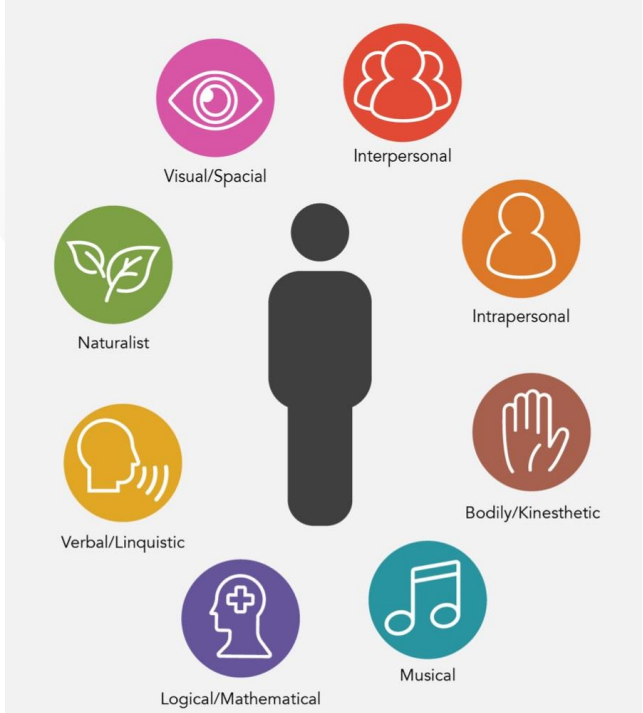
OUR MISSION

To champion the long-term vitality of the Texas Colorado River.

OUR PURPOSE

Reach every Texan with a message of the River's importance.

Strategic Approach to Environmental Education



- Something for everyone
  - Presenting materials in multiple learning styles can trigger confidence to participate, increase engagement, and create meaningful memories and **“Ah-ha” moments**
- Immersive experiences
  - 100% outdoors or inside 360 trailer exhibit
- Science-based (TEKS-aligned)
  - Grades 3, 4, 5, 6, and 7


SWIFT

Field Trip Program Overview

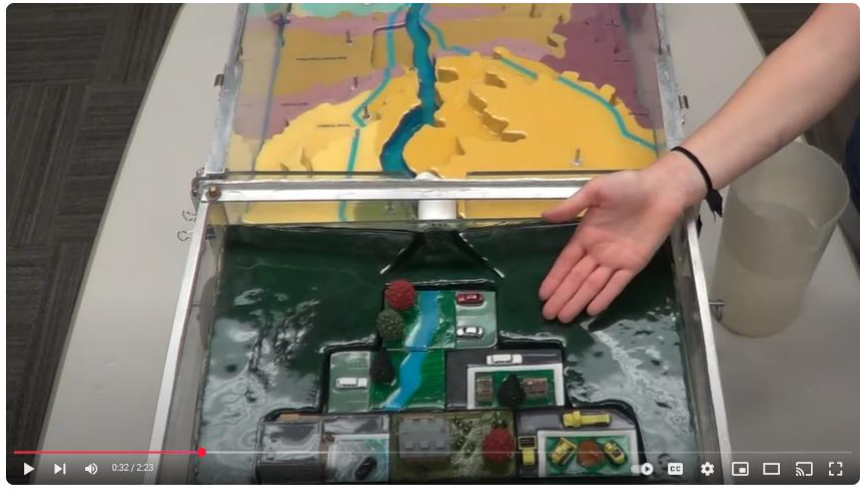
- LCRA's Wilkerson Center for Colorado River Education
- Offers 3 outdoor, TEKS-aligned lessons
  - Texas Colorado River
  - Watersheds & Pollution
  - Water Conservation
- Priority registration & bus scholarships for Title I schools

"It's not just a fun day. It's a fun learning day."
- Cowan Elementary 4th Grade Teacher

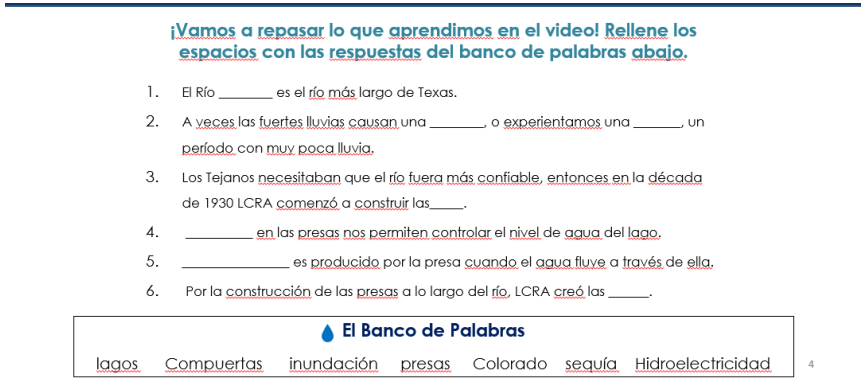
Mobile River Program Overview

- Delivers 3 TEKS-aligned lessons to Central TX middle schools
  - Texas Ecoregions
  - Weathering, Erosion, & Deposition
  - Run-off and Infiltration
- Expands reach through community events and youth visits upstream & downstream
- Immersive trailer exhibit with engaging & interactive displays

Digital Resource Library



Mobile River Round 1



¡Vamos a repasar lo que aprendimos en el video! Rellene los espacios con las respuestas del banco de palabras abajo.

1. El Río _____ es el río más largo de Texas.
2. A veces las fuertes lluvias causan una _____, o experientamos una _____, un período con muy poca lluvia.
3. Los Tejanos necesitaban que el río fuera más confiable, entonces en la década de 1930 LCRA comenzó a construir las_____.
4. _____ en las presas nos permiten controlar el nivel de agua del lago.
5. _____ es producido por la presa cuando el agua fluye a través de ella.
6. Por la construcción de las presas a lo largo del río, LCRA creó las _____.

El Banco de Palabras

lagos Compuertas inundación presas Colorado sequía Hidroelectricidad

4

- Access to TEKS-aligned curriculum, lesson plans, and activities
- Enables educators and families to continue learning beyond in-person programs

Groundwater to the Gulf (G2G)
Summer Institute for Educators

- Equips educators with environmental education resources
- "Ripple Effect"
  - Average number of students impacted through participating educators = 10,000 per year
- Leverages partner resources

CRA's Unique Role

Focus on 3rd-5th grade and middle school students

Deep public private partnerships

Balance in-person, immersive experiences with accessible digital resources

"Ripple Effect" initiatives like G2G unify efforts across the region

The Vision: Future River Heroes

- Inspiring stewardship by connecting communities to the source of their drinking water
- Engrain from an early age awareness and action
- “Ah-ha” moments leading to behavior changes

Thank You!

https://coloradoriver.org/

@coloradoriveralliance

COLORADO RIVER ALLIANCE

Conservation in Practice: Energy & Water Strategies for Texas

Margaret Cook, PhD

HARC

About HARC

HARC is an independent & nonpartisan nonprofit organization focused on advancing science-backed sustainability solutions.

The motivating force behind all HARC's work is to advance a sustainable future for Texas.

HARCresearch.org

Water-Energy Nexus

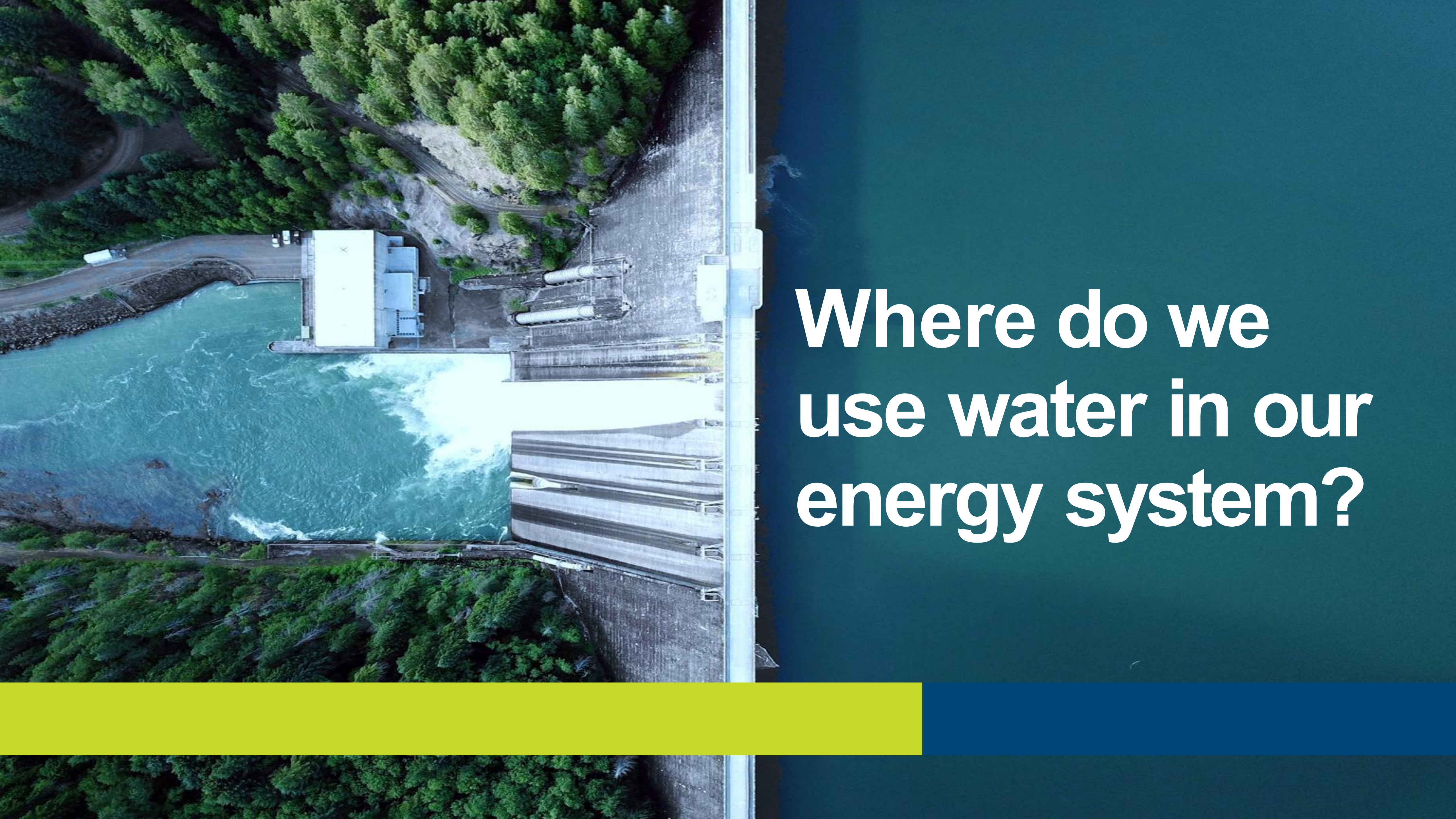
The "water-energy nexus" refers to the interconnected relationship between water usage and energy generation or consumption.

Producing and delivering water requires energy, while producing and generating energy necessitates significant water usage, creating a mutually dependent cycle between the two resources.

W

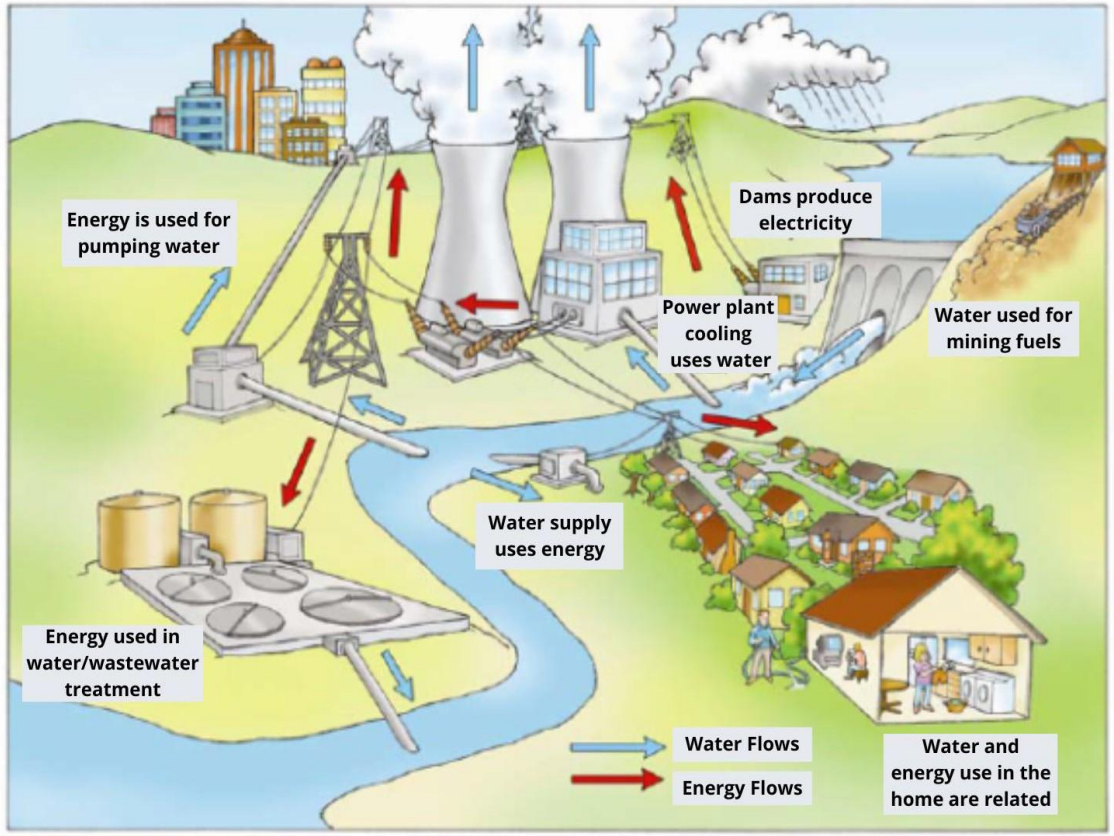
The "v
to the
relatic
usage
consu

Produ
requir
and ge
neces
usage
deper
two re


Where do we use water in our energy system?

Water Consumption in the Energy System

- Electric Generation
  - Cooling for thermal resources: coal, natural gas, nuclear & petroleum
  - Hydroelectric generation
- Residential Sector
- Industrial & Commercial Sector
- Mining



Water-Energy Nexus for Fuels

- Fuel extraction & production
  - e.g., oil, gas, coal, uranium, hydrogen
  - Water recycling & reuse
- Transporting fuels

Water-Energy Nexus for Water Infrastructure

- Heating, treating, pumping, pressurizing, chilling, distributing water
  - ~12% of U.S. energy consumption (12.3 Quadrillion BTU) for direct water and steam services
- Aging infrastructure & water losses = wasted energy
- Grid insecurity leads to water insecurity

Water/wastewater Collection, Production, Treatment, and Distribution Requires Energy

Energy Consumption for Water and Wastewater Treatment

Source: Stillwell 2009

	Source/Treatment Type	Energy (kWh/Mgal)
Water	Surface Water	1,400
	Groundwater	1,800
	Brackish Groundwater	3,900–9,750
	Seawater	9,780–16,500
Wastewater	Trickling Filter	955
	Activated Sludge	1,300
	Advanced Treatment w/o Nitrification	1,500
	Advanced Treatment w/ Nitrification	1,900

Water-Energy Nexus Challenges

Trends Affecting the Nexus

- **Population increase** drives higher energy and water consumption.
- Texas is experiencing **prolonged droughts, and higher temperatures** exacerbating water scarcity and stress.
- **Decarbonization, electrification and expansion** of the energy system may impact water use if not properly managed.

Water-Energy Nexus Challenges

HARCresearch.org

Artificial Intelligence

The AI boom is driving increased energy and water demand. Careful planning should account for this trend.

Aging Infrastructure

Over 186 billion gallons of water leaks from Texas municipal water systems, about 51 gallons per water service line, making water more expensive to supply and altering environmental water quality.

Severe Weather

Disturbances will impact water and energy systems. Care should be taken to ensure both are built in the most resilient manner possible.

"New" Water

Sea water and brackish water desalination and produced water reuse are energy-intensive water strategies.

“New” Water Supply Strategies

<u>Long-Haul Transfer</u> requires more energy than conventional treatment.

- More energy means higher costs: + ~13% San Antonio residents’ water bills

<u>Desalination</u> requires more energy compared to conventional treatment.

- Brackish groundwater requires 2-7x more energy.
- Seawater requires 5-12x more energy.
- Desalination + long-haul transfer, e.g., Houston to Dallas uses 9-23x more energy.

<u>Water Reuse</u> reduces energy demand due to lower treatment requirements.

HARCresearch.org

Water-Energy Nexus Challenges

HARCresearch.org

Hydrogen

The hydrogen industry is poised to expand significantly in the coming years, likely increasing water demand.

Geothermal

Geothermal energy production requires water and only accounts for a small fraction of generation today. This may change with efforts to expand the industry in Texas

Carbon Management

Carbon capture and storage methods require significant water resources. With growing interest in deploying more CCS technologies, this could strain water supply.

Demand Reduction

Emphasis on reducing water and energy use in all sectors could prove impactful.

Water-Energy Nexus Opportunities

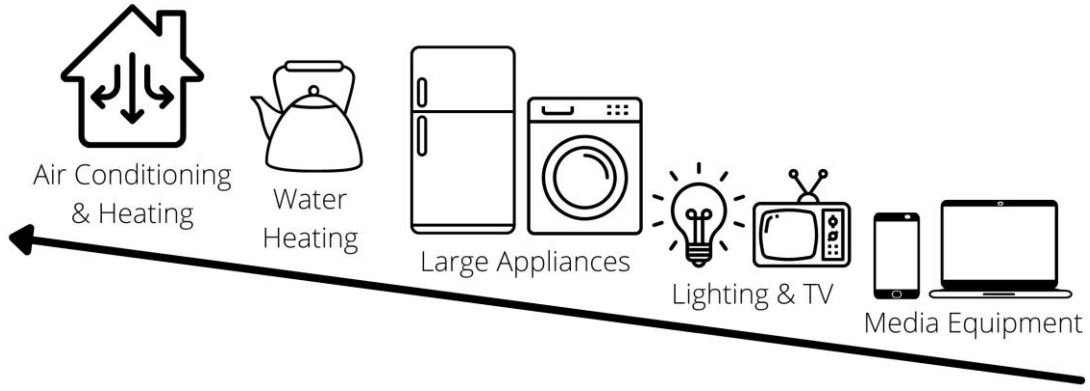
save water

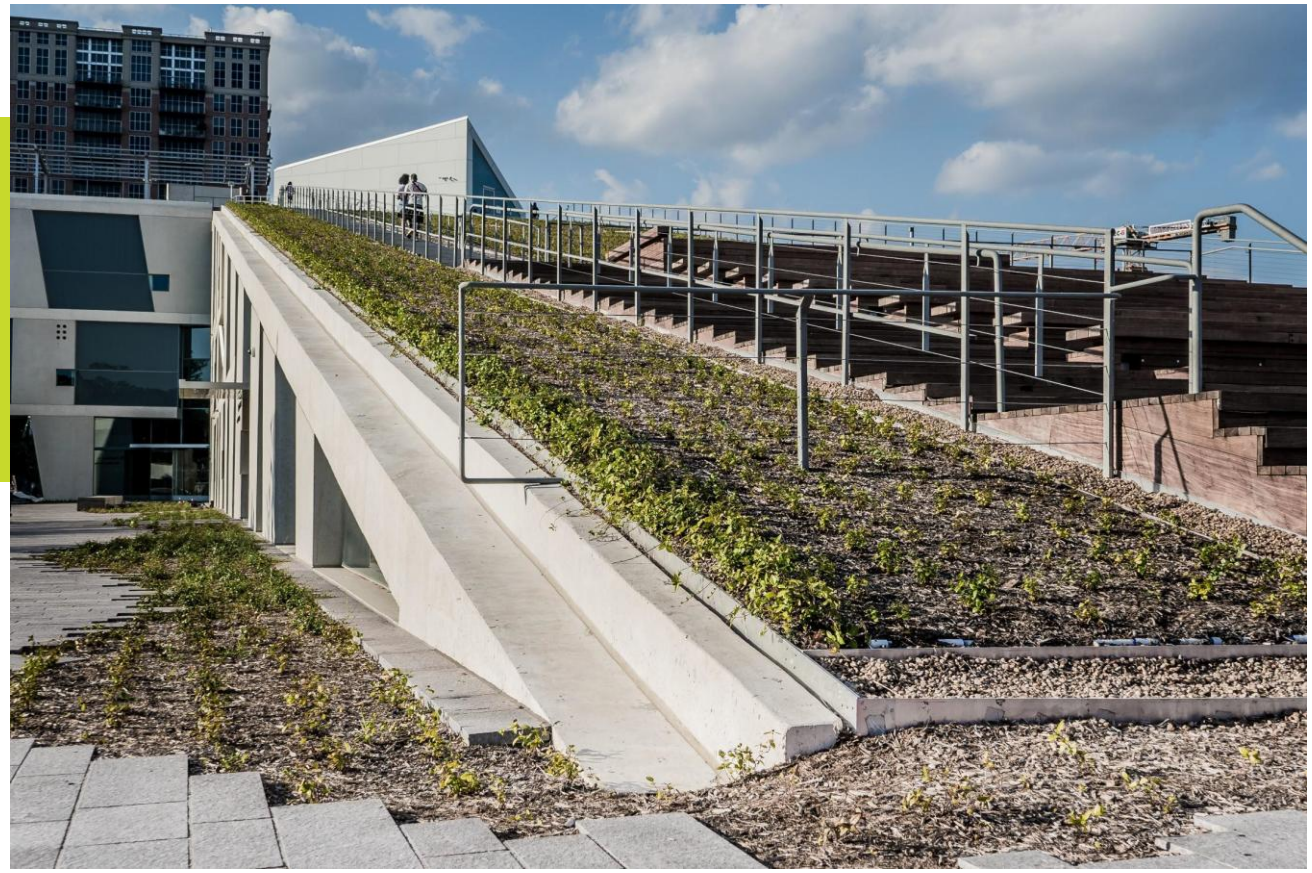
save energy

Energy conservation and water conservation go hand-in-hand

Spotlight: Local Weatherization & Home Repair

- Save energy and improve housing quality + health outcomes
- Resources for weatherization and repair available from multiple nonprofits, utilities, and municipalities – can seem unwieldy to residents
- Avoid deferrals with adequate education, support – save residents and programs time/effort, money
- Repair + other resources needed for:
  - Structural damage
  - Mold
  - Pests
  - Excessive Storage
  - HVAC, electrical, plumbing, gas, damage, asbestos





Green roof at The Museum of Fine Arts, Houston

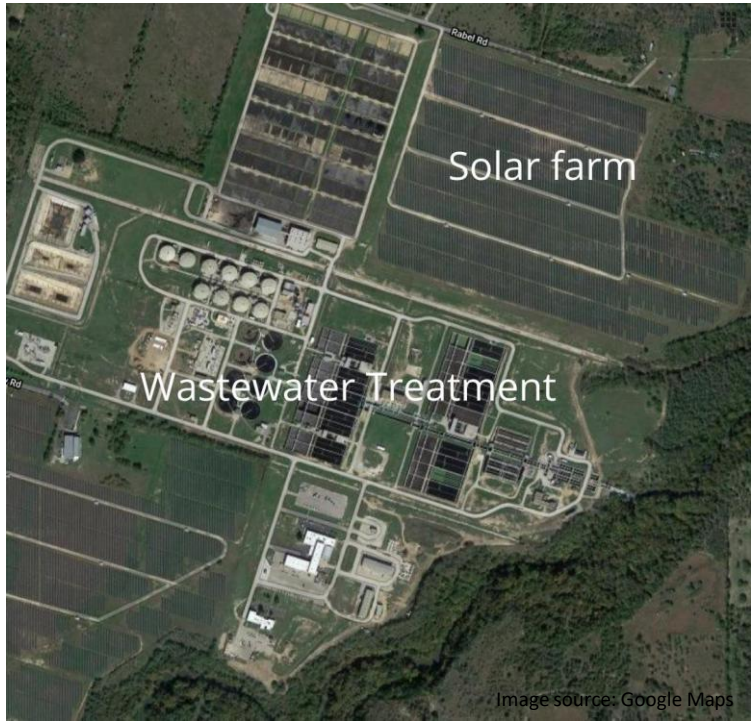
Nature-Based Infrastructure

- Practices that conserve & mimic natural processes to help communities better bounce back from extreme events
  - E.g., rain gardens, constructed wetlands, bioswales, beach & coastal dune restoration
- Can reduce urban heat & flood impact, improves water & air quality
- Currently often more common in more affluent areas

One Water

- Philosophy that all water has value and should be managed sustainably and inclusively
  - Stormwater, wastewater, drinking water, surface water, groundwater, sea water, etc.
- Account for water quantity & quality
- Unified planning for long-term resilience
- Emphasis on engagement, incorporating all voices in planning
- Austin & New Braunfels

Addressing Local Challenges



Solar farm located at wastewater plant

Wastewater effluent cooling a combined cycle power plant

Treated oilfield wastewater for reuse in a new well

Conservation Recommendations

Assess emerging energy-water concerns

Evaluate emerging industry potential water demands, expected supplies, and alternative strategies

Assess opportunities for One Water and nature-based solutions

To address water supply & flooding concerns

Identify opportunities for co-benefits

E.g., partnerships between industry & local water suppliers for leak detection & reduction, water recycling support, conservation incentives to keep regional demand level

Policy Recommendations

Local programs (and state legislation) to increase energy savings and demand response goals

Promote the use and expansion of energy technologies or methodologies that minimize water use & water strategies that minimize energy use

Evaluate current policies and consider methods to financially incentivize water and energy savings from all sectors

Bonus Recommendations

Fairness in spending government funds at the local, regional, state, and federal level

Communities w/ high risks

Opportunities for leak detection & reduction, water affordability, local resilience, etc.

Incorporating community members in planning, co-designing solutions

Increasing public engagement with earlier involvement, accessible options &/or incentives, facilitators, transparency

Incorporating lived & practitioner experience

Identify & address causes of imbalances

E.g., causes of legacy pollution, monitoring sewage overflows & drainage disparities, community research

Barriers to improved technology, policy, remediation, etc.

CONTACT US

For further information, contact HARC at
(281) 364-6000 or visit www.HARCresearch.org.

Connect with HARC via Instagram, LinkedIn,
Facebook or Twitter. Like or follow @HARCresearch.

HARC

Additional Resources & References

Microgrid Technologies

Natural Disaster or Storm Events	Flooding	High Winds	Earthquakes	Wildfires	Snow/Ice	Extreme Temperature
Battery Storage	◒	○	◒	●	○	◒
Biomass/Biogas CHP	◒	◒	◒	●	○	○
Distributed Solar	○	◒	◒	●	◒	◒
Distributed Wind	○	◒	◒	◒	◒	◒
Natural Gas CHP	○	○	◒	◒	○	○
Standby Generators	◒	○	◒	●	◒	○

Hydrogen Water Intensity

Name	Process	Inputs	Outputs	Water Demands
Green Hydrogen	Electrolysis	Wate r & electr icity	Hydrogen & oxygen	Similar high-end estimates as oil exploration, production, refining (energy equivalent)
Grey Hydrogen	Steam reforming	Steam (fuel) & methane	Hydrogen & carbon dioxide	~0.5x demand for green
Blue Hydrogen	Steam reforming + CCUS	Steam (fuel) & methane	Hydrogen & carbon dioxide (some captured)	~1.5x demand for green

Source: Stantec

Carbon Capture

Carbon capture technologies are water intensive, but requirements vary by technology. Due to these sizable water requirements, ubiquitous CCS may be better suited for states that do not have water scarcity challenges.

Name	Process	Water Footprint
Pre-Combustion CCS	Coal is not burned directly but transformed into a gas from which CO2 is captured.	195 - 586 gal/tonne CO2
Post Combustion CCS	CO2 is captured from power plant flue gas.	451 gal/tonne CO2
Direct Air Capture	CO2 is captures directly from ambient air.	1060 gal/tonne CO2
Bioenergy + CCS	Biomass is burned for energy and the CO2 is captured from the power plant.	88,000 – 152,000 gal/tonne CO2

Adapted From: Lorenzo Rosa, Daniel L. Sanchez, Giulia Realmonte, Dennis Baldocchi, Paolo D'Odorico, The water footprint of carbon capture and storage technologies, Renewable and Sustainable Energy Reviews, Volume 138,2021,110511,ISSN 1364-0321, https://doi.org/10.1016/j.rser.2020.110511.

Case Studies – Boil Water Notices

- High frequency in Texas, small water systems more likely to have issues
- Causes: e.g., unstable line pressure, aging infrastructure, sampled contaminant
  - Regulatory requirements for pipe pressure to maintain chlorine residual & confirm no backflow; **power outages cause can cause pressure issues**
  - NOT always a confirmation of contamination
- Must sample to show water is clean
  - Sampling process 18+ hours; BWN for 24-48+ hours
- **Energy burden on residents:**
  - Boil, treat (e.g., restaurants w/ RO systems), purchase alternative clean water
  - Not a solution in a power outage

Case Studies – Contaminants

- Higher contamination of water resources or the presence of complex contaminants can increase the energy required to treat the water. Specialized treatment can increase energy intensity.
- Water systems need funding to meet increasing treatment demands.
- Aging and inadequate infrastructure becomes a source of pollution.

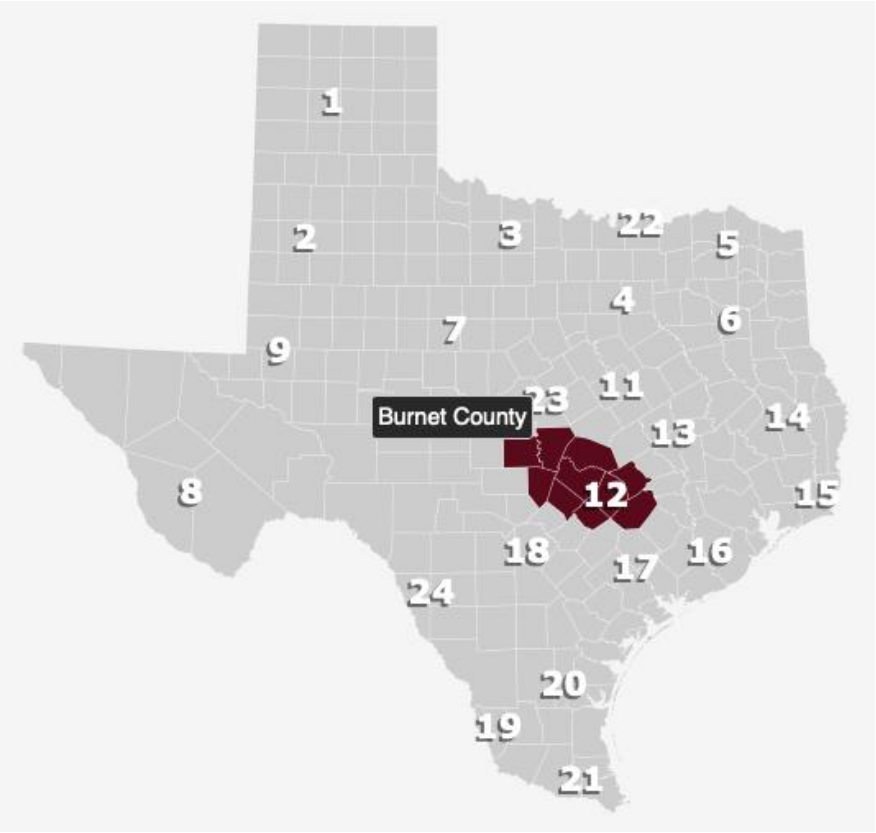
Panel Discussion

- Moderated questions
- Open Q&A

Questions?

Located in the CAPCOG region?

Let's hear your voice: (Bastrop, Blanco, Burnet, Caldwell, Fayette, Hays, Lee, Llano, Travis and Williamson Counties)



Take this SURVEY!

Public Agencies, Non-profits, Energy/Water Utilities, and organizations associated can respond:

Feedback on this Event

Capital Area Council of Governments

www.capcog.org

Ramon Zarate
Air Quality Program Specialist
512-916-6185
rzarate@capcog.org

South-central Partnership for Energy Efficiency as a Resource

www.eepartnership.org

Shaun Auckland
Senior Manager, Government and Community Engagement
512-279-0765
sauckland@eepartnership.org