



# *Leveraging AI to Optimize Utility Customer Experience*

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**Utility Energy Forum | April 25, 2025**

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## What work do we *want* AI to do for us?

- ✓ **Take on repetitive, tedious tasks**
- ✓ **Eliminate boring work- or home-life activities**
- ✓ **Replace humans on dumb/dirty/dangerous jobs**
- ✓ **Optimize our information or entertainment streams**
- ✓ **Help me learn a new subject more quickly and easily**
- ✓ **Help diagnose illnesses based on personal information**
- ✓ **Filter out all the “noise” that saps our time and attention**
- ✓ **Assist in problem solving where time, resources are scarce**

# Internal policies at our utility limit potential value

- Today, most value is still tied to writing content, researching
- Some generative-AI (GAI) applications can sit *on top* of enterprise software like CRMs, but we don't have a CRM
- Part of the value of GAI tools is that they can learn over time from your chats with them, but we don't allow that
- Copilot is now approved, and *"uses tech from OpenAI,"* but most employees still don't have access to all features
- It could still be some time before GAI is broadly used (& useful)
- *"At my wife's company, they are already doing this..."*

# Utility cultural challenges also limit deployments

*"It's a black box!"*

*"We don't have time or resources to innovate"*

*"We have 100 other 'top' priorities"*

*"We don't understand the risk, so we assume it's unacceptably high"*

*"We tried something similar 5 years ago and it didn't work"*

*"We only do what the regulator tells us to do"*

*"AI will eliminate jobs/budgets"*

*"This doesn't impact our goals or performance metrics"*

*"Our 2-year plan is set in stone"*

*"Our preferred vendor/consultant says we don't need to do this"*

*"AI is scary! Didn't you watch Terminator?!"*

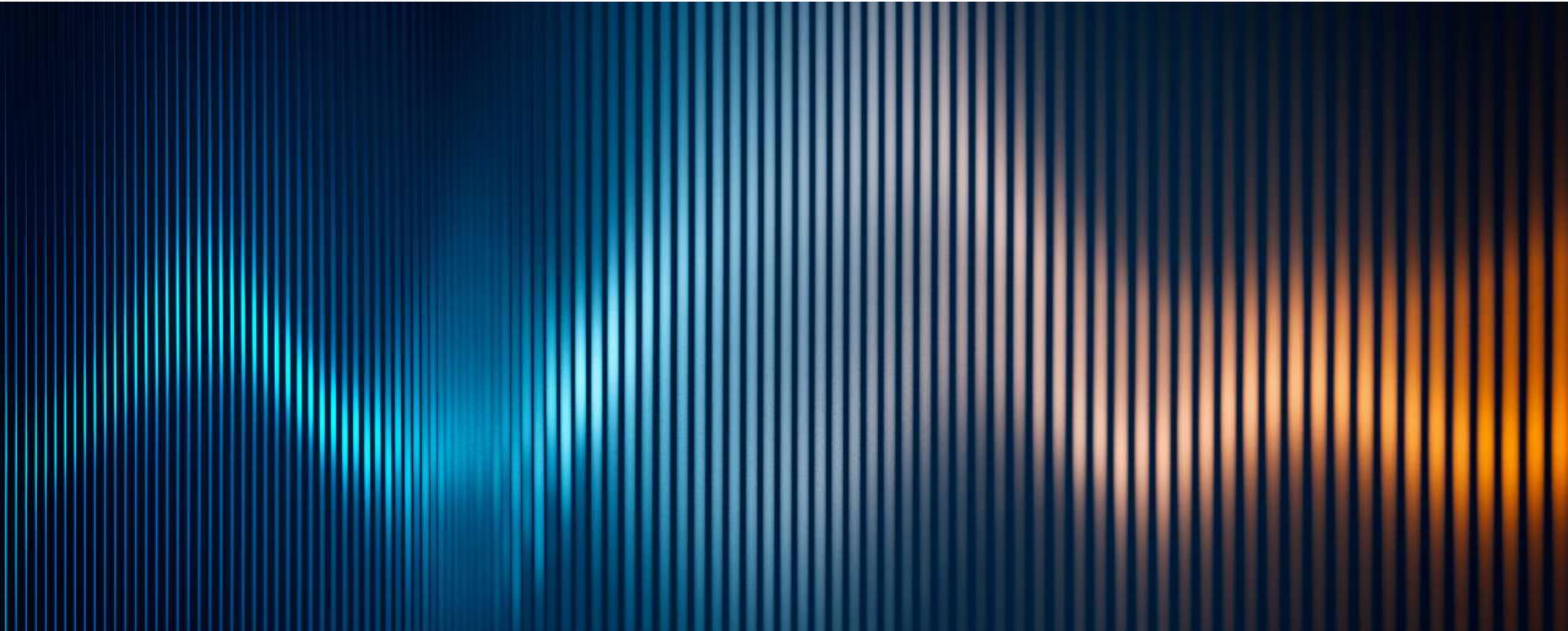
# AI solutions on a spectrum from “bad” to “benevolent”

**Benevolent Solutions –**

*Human-Centered & Supervised*

**Bad Solutions –**

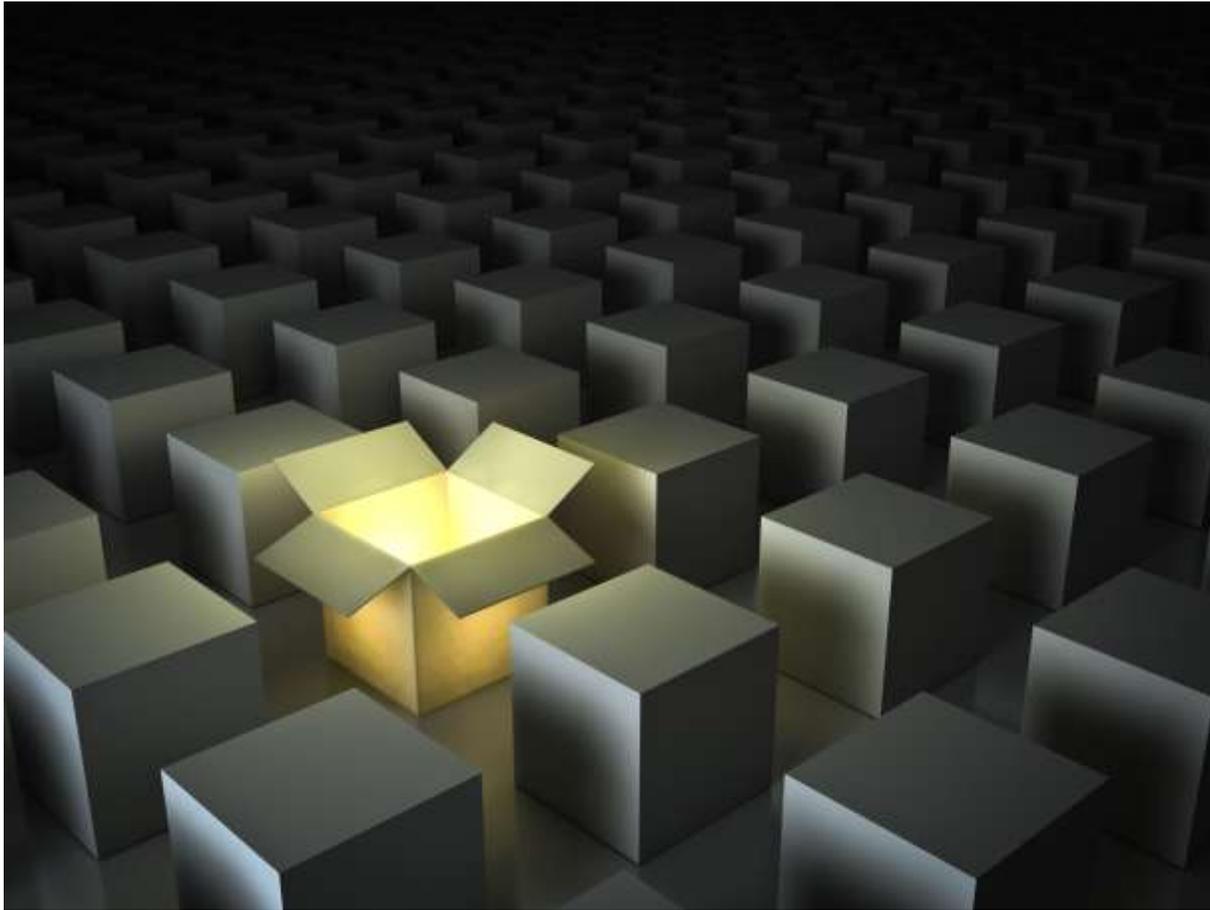
*Trained to Own Your A\$\$*



# How can we trust AI for mission-critical decisions?

	Consumer AI	Mission-Critical AI
<b>Examples</b>	<ul style="list-style-type: none"> <li>• ChatGPT</li> <li>• eCommerce recommendations</li> </ul>	<ul style="list-style-type: none"> <li>• Medical imaging diagnostics</li> <li>• Fraud detection</li> </ul>
<b>Consequences of being wrong or a bit random</b>	<b>Low</b>	<b>Very high</b>
<b>Transparency, Explainability, Reproducibility</b>	<p>“Black box” models are prevalent</p> <ul style="list-style-type: none"> <li>• How the algorithm makes its decisions is not visible or understandable to humans.</li> <li>• If you enter the same prompt, you are not guaranteed the same result</li> </ul>	<p>“Glass box” models &amp; rigorous ML Operations are required</p> <ul style="list-style-type: none"> <li>• Humans can understand the algorithm’s behavior and rules</li> <li>• Can reproduce results for consistency, explainability, audit trail</li> </ul>
<b>Data ownership &amp; privacy</b>	Consumer interactions and data can be “owned” and used by the AI solution vendor as additional training data, or even sold to other third parties	User interactions and other data are stored separately & securely from general model training data and are owned by the enterprise, not the AI solution vendor

# Evaluation challenges – “black box” vs. “glass box”



**Black Boxes Everywhere** – *A Needle in a Haystack*



**Glass Box Unicorns** – *Transparent Co-Development*

# Exploring AI challenges (and opportunities)



Governance



Data centers, economic development



Customer resource management



Workforce augmentation



Resource needs, impacts



Content creation



Fortis Center of Excellence



Research enhancement



Data quality

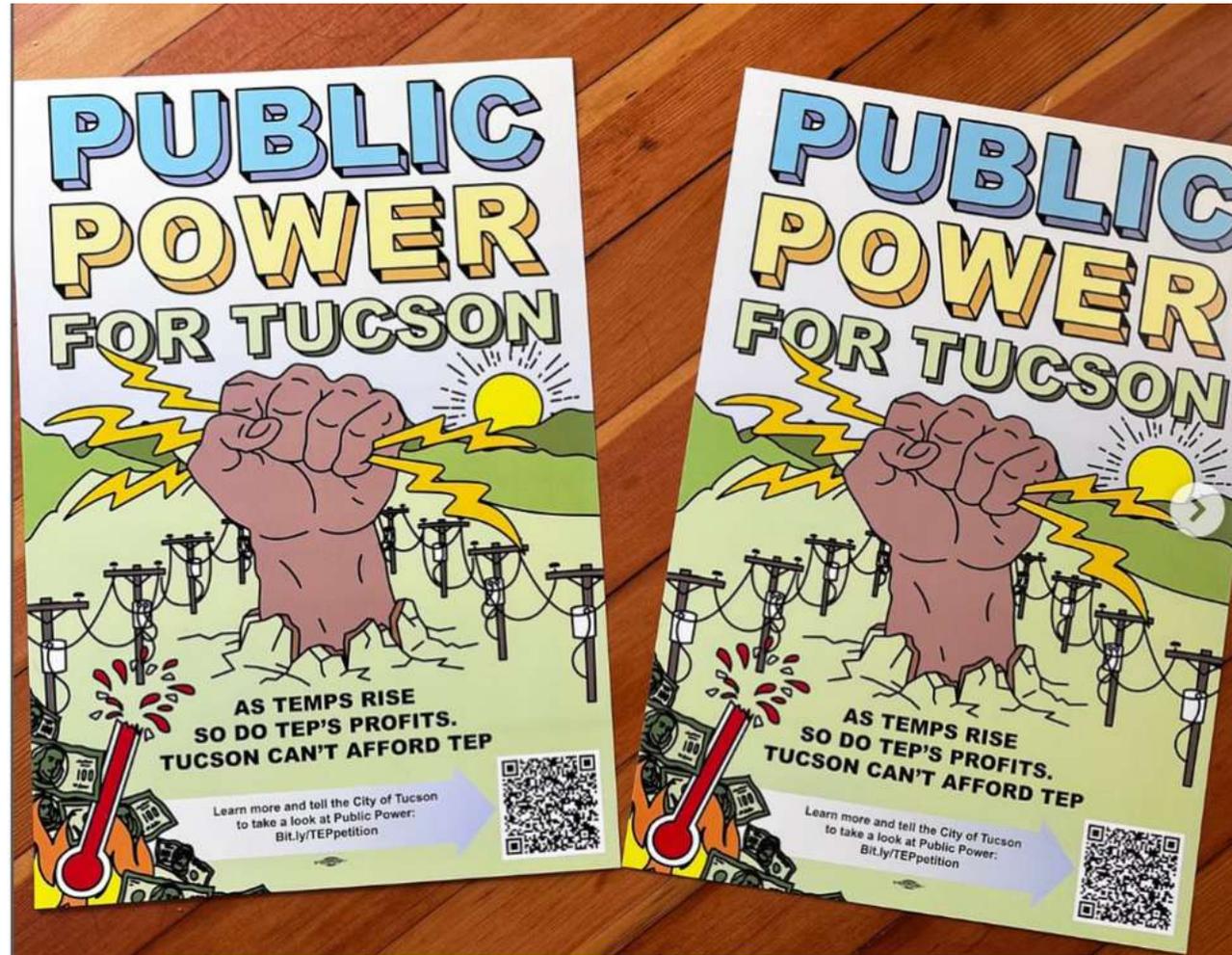


Customer support



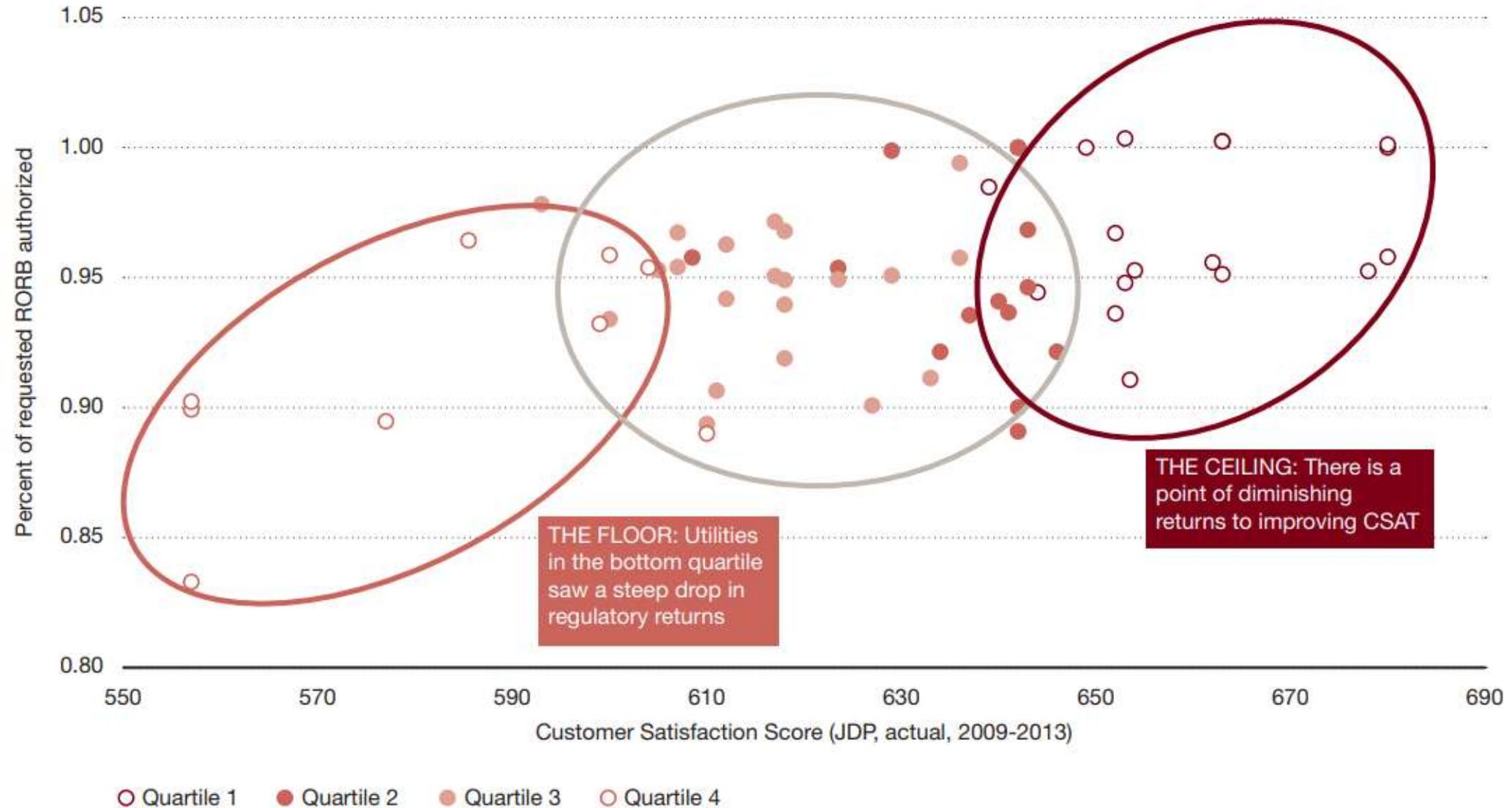
Program delivery

# External challenges: affordability, optionality, climate



## Utilities with higher customer satisfaction achieved better regulatory outcomes

Utility rate case success compared to Customer Satisfaction (CSAT)



Source: PWC, 2015

# Assistance & incentives vs. affordability challenges

## Customer Assistance

Having trouble paying your electric bill? TEP offers several customer-funded programs and partners with local and state agencies to assist customers facing financial hardships and to help them reduce their energy use. These programs provide one-time assistance to qualifying families, payment extensions or monthly discounts.

**Lifeline Program** – Lower-income residential customers may be eligible to receive discounted electric service through our [Lifeline](#) program.

**Payment Extensions** – Need a little extra time paying your bill? Customers may request a payment extension by visiting [My Account](#) or calling TEP Customer Care at 520-623-7711.

**Short-term Assistance** – TEP partners with several community agencies to offer emergency bill-payment assistance to customers facing hardships.

**Weatherization Assistance** – TEP works with local agencies to help limited-income residents weatherize their homes with energy efficiency upgrades and offers energy efficiency workshops to help them reduce energy use and costs.

**HEERO Program** – Customers can help ease the burden of other customers who are struggling to pay their bills by contributing to our [Help with Emergency Energy Relief Operation](#) (HEERO) program. Customers simply round-up the amount on their bill to the next highest dollar. Over the HEERO program's 20-plus year history, more than \$3 million has been donated to assist hundreds of families each year.



Three ways TEP Helps Limited-Income Families

TEP is working to improve the quality of life for our most vulnerable residents.

[Learn more](#)

## Low Income Home Energy Assistance Program



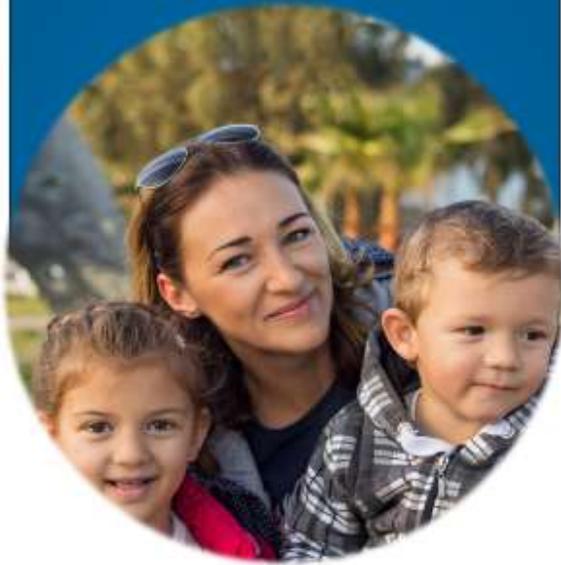
Apply for Assistance



FAQs for Applicants



Dashboard



## Natalie

### TEP Residential Lifeline Customer

“ Being a single mom is not a status, but a badge of honor. ”

#### MY STORY

-  Tucson, AZ
-  32 Years Old
-  Single Mom with two children

Natalie, is a single mother of two children, aged 3 and 5, who works as a mental health and substance abuse counselor for a local non-profit. Natalie is passionate about helping people and taking care of her children, and focused her college degree on social work, only to discover that jobs in her field of passion pay barely enough to cover her student loans and rent. She is now about to undergo a 'trimming' of hours, which will take her down to part time eliminating her health benefits. Without family to rely on, Natalie is now contemplating her options to be able to sustain herself and her children and maintain her housing.



#### GOALS

- Find employment that is both mentally and financially fulfilling in the hopes of breaking the paycheck-to-paycheck cycle
- Creating a supportive network of friend or community resources to share challenges, advice, and childcare responsibilities, fostering a sense of belonging and mutual support
- Take care of herself so that she can continue to care for her children

#### VALUES & BELIEFS

- The wellbeing and happiness of her children is her highest priority
- Challenges are opportunities for personal growth and practicing resiliency
- Supporting and being supported by others, especially fellow single parents facing similar struggles, creates a powerful community

#### MOTIVATORS

- The safety and security of her children, typically sacrificing her own needs
- Determination to grow personally and professionally and have some sort of savings for emergencies
- Taking care of those whose needs are different than hers, but equally challenging

#### NEEDS & WANTS

- Needs stable and affordable housing and healthcare to provide a safe and secure environment for her family
- Needs assistance with finances until she can find more job security
- Wants opportunities for career advancement that offer better pay, stability, and potential for growth
- Wants to be able to take a vacation with her children, even for just a weekend, but knows she needs to use every penny to make ends meet

#### FRUSTRATIONS & PAIN POINTS

- She needs to choose between taking 3 buses going to get assistance and working another part time job to pay her bills
- She feels like she needs to constantly decide between paying rent, paying her electric bill, or paying for food – she trades off late fees every other month between these things
- She appreciates the \$20 a month she receives for energy assistance, but in the summer, it doesn't make a dent in her \$400 a month bill
- She has been threatened with disconnection of her electric service in the past, and fears being in this position again



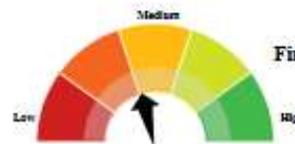
## Hello Vic Residential Electric Customer

“ I don't believe in taking a handout. I just want my power to stay on and my bill to be something I can afford to pay. ”

### MY STORY

- Meadow, AZ**
- 68 Years Old**
- Widowed**

Vic is a retired Navy veteran who moved to Meadow after his wife passed away. They never had children, but he considers his rescued pups, Jake and Daisy, to be family. He enjoys spending time with other vets at the American Legion down the road from his house but really enjoys the solitude and privacy the area affords him. Vic lives in a manufactured home that has plenty of room for the dogs to roam and that lets him see some amazing sunsets over the mountains from his porch. He is grateful for his military pension and social security that help secure the simple life he so enjoys.



Financial Security



Energy Usage

### GOALS

- Vic is invested in keeping life hassle free. He doesn't need much and doesn't look for trouble.
- He would like to be more self sufficient, maybe even generating his own electricity at some point.
- He has minimal possessions and wants to reduce any distractions. He spends time reading and is glad to finally have some satellite service for internet and phone.

### VALUES & BELIEFS

- Vic believes in doing all things with integrity and honor.
- He also believes in self reliance. He'd rather have less than ask for additional assistance.
- He is very patriotic and values his privacy. He is glad to find like minded folks at the legion who share his life experiences.

### MOTIVATORS

- Vic enjoys the challenge and satisfaction of his independent lifestyle, even though he's starting to feel his age a little.
- He wants to continue to be independent, so makes sure to walk with the dogs as much as possible to keep his mind and body active.
- He truly wants to live and let live, so he's inspired to stay out of any local drama.

### NEEDS & WANTS

- Vic needs very little to get by in life. He has the basics and all of it is owned with no debt.
- He wants to stay physically fit and gets his check up at the VA Clinic in Kingman annually. It might almost be time for that knee replacement though, but he's worried about who might check on him and the dogs.
- Vic just wants to have things work. He doesn't ask for much and just expects reliability from the services outside of his control, like his internet, electric, and water.

### FRUSTRATIONS & PAIN POINTS

- Although Vic really enjoys living in Meadow, he doesn't enjoy the power outages he has experienced, outages also take out his phone service. He thinks things might be better with the recent upgrades but is waiting to see for certain.
- He feels like his electric bill keeps getting higher although he hasn't changed the way he uses electricity. He'd like to understand why that is happening and what he can do. The price of everything else keeps going up too and it's getting harder to stay on top of the bills.
- If the price of electric keeps rising, it is probably going to push him to look into going solar sooner rather than later. The solar installers that visit him say that UniSource pays people for the energy they generate and thinks perhaps that's something he should look into.



## Hello Frank and Rosa Residential Gas and Electric Customers

“ I wish there were assistance programs available for customers like us. Sometimes, our combination utility bills are a bit overwhelming. ”

### OUR STORY

- Nogales, AZ
- 28 Years Old
- Family of four, own home

Frank and Rosa are high school sweethearts who attended Nogales High School and both finished degrees at Pima Community College at Santa Cruz. Frank came back to his school district to work as an IT technician. Rosa completed a certified nurse assistant program and works at a local senior living facility. They live close to their hard working, extended families in Nogales, and are grateful for Frank's mother and her willingness to care for their young children, Sofia and Isa. They enjoy taking their turn hosting the weekly family meal at their moderately sized home, which they purchased from a cousin. They are quite frugal with their spending and oftentimes travel to Mexico for some of their necessities and care.



### GOALS

- To watch their children grow up healthy and happy and surrounded by their family.
- To continue their education as time allows. Right now, the needs of their children are taking priority.
- To eventually "pay forward" the kindness of their cousin and sell their home to another relative just getting started in life while moving to a larger home that provides more space.

### VALUES & BELIEFS

- Family bonds are one of the most significant things in their lives. Elders are treated with the respect they have earned.
- They value hard work and education as a means to a better future for both them and their children.
- Their heritage and culture are of great importance to them, and they want to ensure their children grow up understanding their traditions and faith.

### MOTIVATORS

- Ensuring their children have access to quality education and opportunities for a successful future.
- Achieving financial security and stability is important. They are motivated by career advancement, home ownership, and prudent financial planning.
- The health and happiness of the family unit are crucial, and they want to ensure good health care, and foster strong family relationships.

### NEEDS & WANTS

- While they are both employed, they are still barely scraping by with living expenses. Rosa is making minimum wage, and her hours continue to dwindle.
- While Frank's promotion is great, the family doesn't consider themselves financially solvent. They are working on building their credit by making their mortgage payments on time as often as they can.
- They want to be able to lower their utility expenses, but their home gets very cold in the winter at night and very warm in the summer mid day. They want their children to be comfortable, but sometimes hold off on running the heat or A/C to see if they can keep their bills under control.

### FRUSTRATIONS & PAIN POINTS

- They know there is a discount for low income customers, but they don't qualify because they make just a bit too much. They don't want to lie to get assistance.
- They would do much better if they could choose a date that their utility bills were due! It would help them with their budgeting if they could plan around their pay periods.
- The number of times they are out of power seems to be increasing over the years. Sometimes it's just a flicker, but they've had some pretty big storms in the summer and no real communication about when their power might be back on. With two small children, they'd like to know if they should stay with their family for the night to stay cool.

# So, how could AI improve the lives of these customers?



**Natalie**



**Vic**



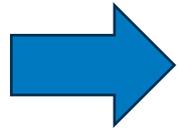
**Frank & Rosa**

Source: Rock Rabbit

# Exploring opportunities – a few AI solution providers

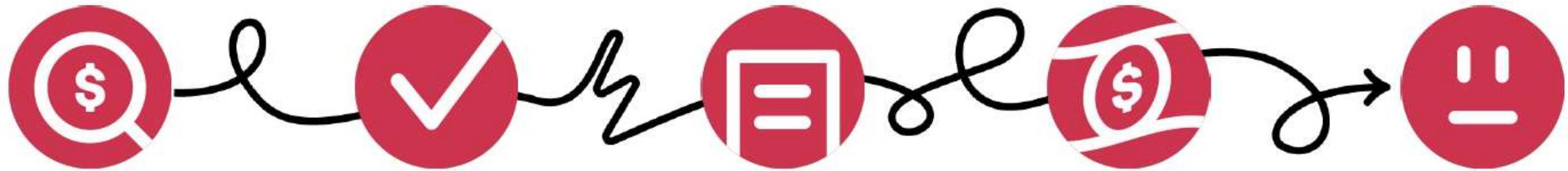


# Exploring opportunities – a few AI solution providers



# Journey-mapping the customer friction points

## Business as usual



### Incentive Discovery

- ✘ Hours of desktop research

### Eligibility Requirements

- ✘ Complex, differing & changing requirements

### Incentive Paperwork

- ✘ Hours of paperwork

### Cash Flow

- ✘ Weeks to months delay to receive funds

Source: Rock Rabbit

# Making the process straightforward and friction-free

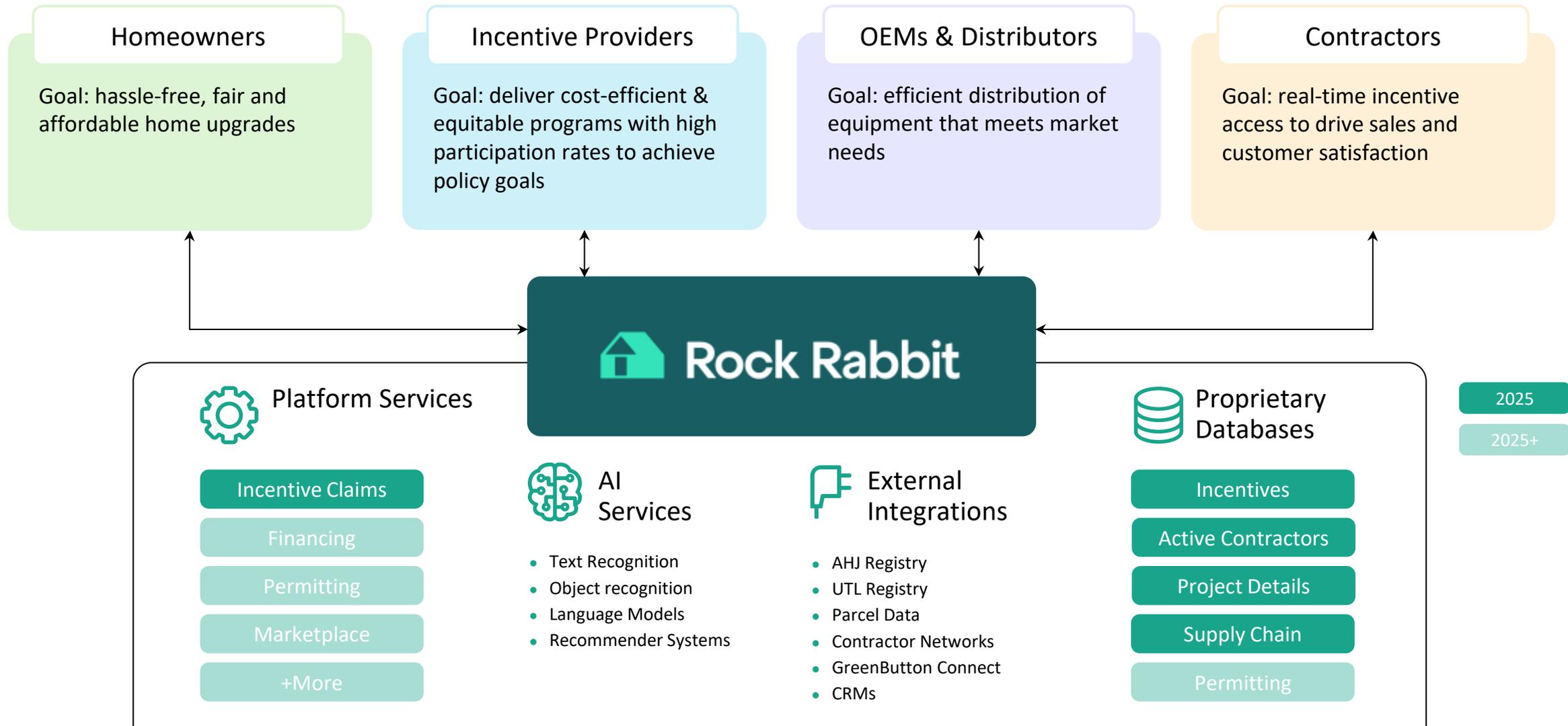
## With Rock Rabbit



Source: Rock Rabbit

# An AI-powered platform, built for home electrification

Rock Rabbit integrates the highly fragmented landscape of actors, processes & data to drastically reduce friction across the value chain of the residential electrification market



# The meaning of “Rock Rabbit”

A rock rabbit is another name for an American pika, a small, mountain-dwelling mammal that is especially sensitive to rising temperatures. Rock rabbits are disappearing due to their habitats being threatened by global warming. They are considered an indicator species for detecting the devastating impacts of climate change.



# Tucson's own version of "Rock Rabbit"

The Sonoran Desert "wood rat" a.k.a., "pack rat" is also sensitive to climate change impacts and can be viewed as an indicator species. The Southwest region's version of the American pika 😊



# Leveraging back-end capabilities to deliver value



Custom implementation

## Generative AI

Making policy accessible, such as incentives & permitting requirements



Standard implementations

## Computer vision

Automatically parse text from appliance labels, invoices & permits



Out-of-box

## Geofencing

Verify physical location of building upgrade project through out-of-the box mobile OS features



Custom implementation

## Claim validation

Automate claim review for validity and correctness, and provide explainable insights

# Transforming the customer experience

## Example Use Cases

	Project Location	Installation Timeline	Equipment Eligibility	Installation Photos	Other Application Requirements (project costs, permit, etc.)
Old Way	Proof of address	External apps to date & time stamp photos	Manual equipment look-up	Manual review of submitted photos	Manual entry & review
With Rock Rabbit	 <p>Geofencing from photo metadata</p> <p>Out-of-box</p> <p>Accurate to within a 15ft radius</p>	 <p>In-app date &amp; time stamping</p> <p>Out-of-box</p> <p>Precise date and time</p>	 <p>Text recognition of appliance labels</p> <p>Standard implementations</p> <p>Targeting &gt;97% accuracy on most labels*</p>	 <p>Computer vision to analyze images</p> <p>Standard implementations</p> <p>Targeting &gt;95% accuracy*</p>	 <p>Text recognition for automated data entry &amp; review</p> <p>Standard implementations</p> <p>Targeting &gt;90% accuracy*</p>

\*Accuracy level dependent on data available for model training

# AI solutions that could benefit these customers



**Natalie**



**Vic**



**Frank & Rosa**

Source: Rock Rabbit

# Thank you!

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