

A nighttime photograph of a city street. In the foreground, there's a dark, ornate metal railing. Beyond it, a street with trees and buildings is visible. In the background, two tall, illuminated columns topped with statues stand prominently. The scene is lit with warm yellow streetlights, and there are some light trails from moving vehicles on the left.

# Imagining the Utility of the Future

Sharelynn Moore, Itron & Curtis Kirkeby, Avista





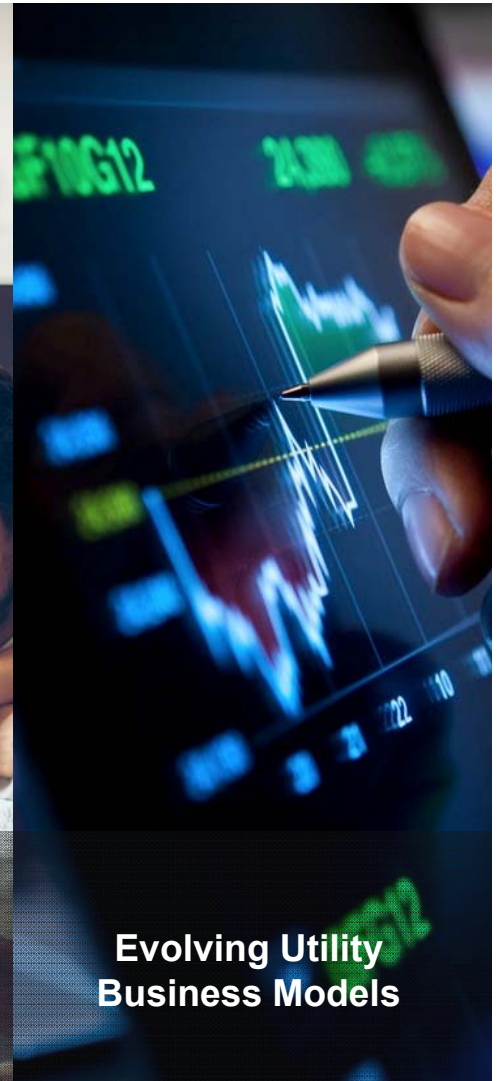
**Internet  
of Things**



**Integrating  
Distributed Energy  
Resources**



**Greater Customer  
Expectations**



**Evolving Utility  
Business Models**



A photograph of a person standing on a dark, rocky mountain peak. The person is silhouetted against a bright, hazy sky. The background shows a vast landscape of rolling hills and mountains, with a warm, golden light suggesting sunset or sunrise. The title "The Utility of the Future" is overlaid in white text in the center of the image.

# The Utility of the Future



A person is standing on a dark, rocky mountain peak in the foreground. The background shows a vast landscape of rolling hills and mountains under a sky with soft, golden light from a low sun, creating long shadows and a hazy atmosphere. The overall tone is serene and majestic.

## **SAFE, RELIABLE AND RESILIENT POWER DELIVERY**

**The grid is not going away**

Optimize ROI on wires, pipes, communication/control infrastructure



A person is standing on a dark, rocky mountain peak in the foreground. The background shows a vast landscape of rolling hills and mountains under a sky with soft, golden light from a low sun, creating a silhouette effect on the terrain.

## **DYNAMIC AND INTERACTIVE GRID**

**Real-time data and decision making at the edge drive operational excellence**

Resource planning

System planning

System operations

DER integration



A person stands on a dark, rocky mountain peak in the foreground, looking out over a vast, hazy landscape of rolling hills and mountains under a sunset sky. The sun is low on the horizon, casting a warm, golden glow across the scene. Overlaid on this image is text in yellow and white. The text is arranged as follows: a yellow title at the top, a white subtitle below it, and a list of five white items in the center-right, each preceded by a small white square.

## CONSUMERS BECOME PROSUMERS

Transactive energy at the distribution grid level requires a broker

Market animation

Localized transactions

Pricing signals

Settlement

Compliance



A person stands on a dark, rocky mountain peak, silhouetted against a bright, hazy sunset sky. The sun is low on the horizon, casting a warm, golden glow over the scene. In the background, rolling hills and mountains are visible, their details softened by the distance and the light. The overall mood is one of solitude and achievement, with the person's presence suggesting a journey or a goal reached.

## NEW REVENUE OPPORTUNITIES

### Rising customer expectations create opportunity

DER services (*renewables, EVs, storage, DR*)

Customized energy efficiency programs

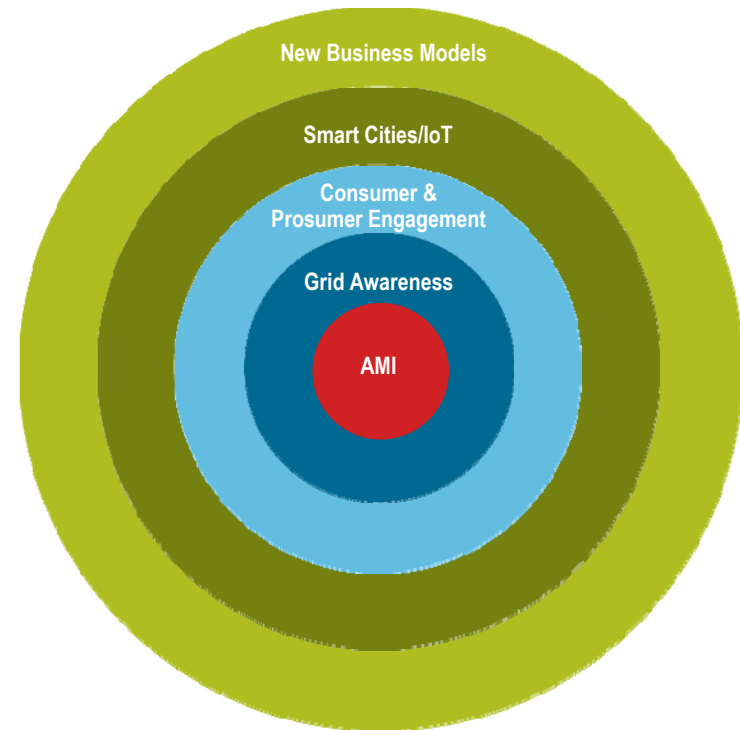
“Experiential” service offerings: reliability, clean energy, time-based pricing, prepay

Infrastructure services to support public and government transportation, waste, safety offerings

Distributed apps, data-driven services

# PATHWAY TO INDUSTRY TRANSFORMATION

- » Meet today's operational needs while preparing for a transactive grid by deploying grid edge infrastructure that can be configured as simply as AMI today
- » Improve business operational efficiencies through grid awareness
- » Provide the ability to engage and equip consumers AND prosumers
- » Invest in a platform that opens up new business models and revenue streams





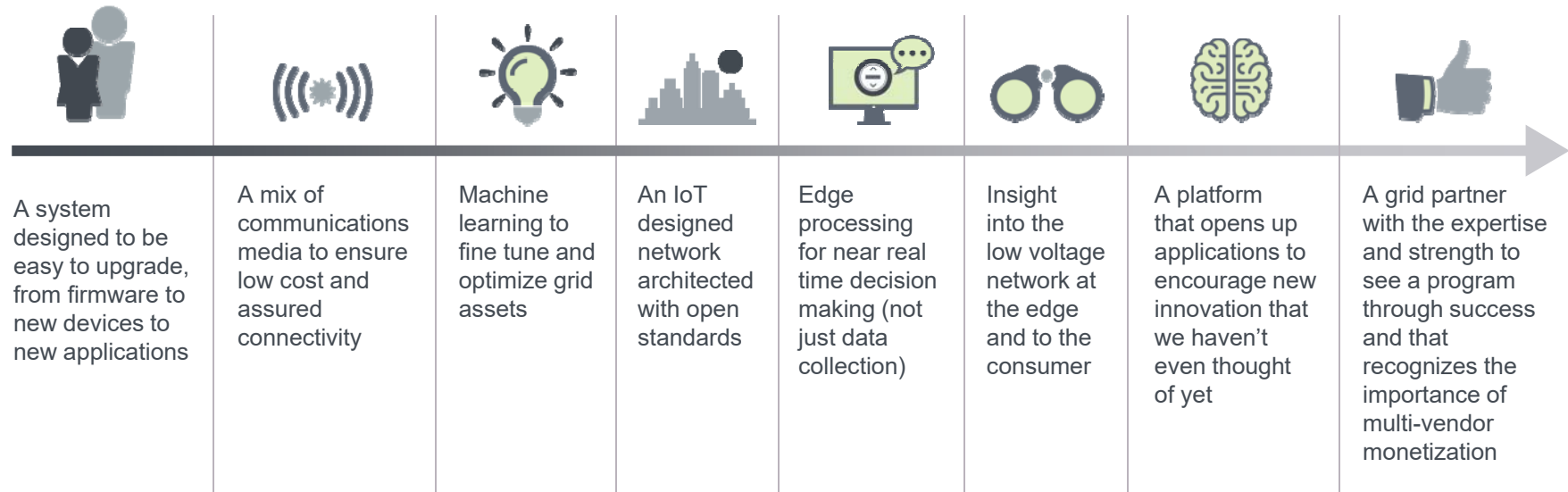
# WELCOME TO **THE ACTIVE GRID**

Where the smart grid meets IoT





# WHAT'S NEEDED FOR THE ACTIVE GRID?



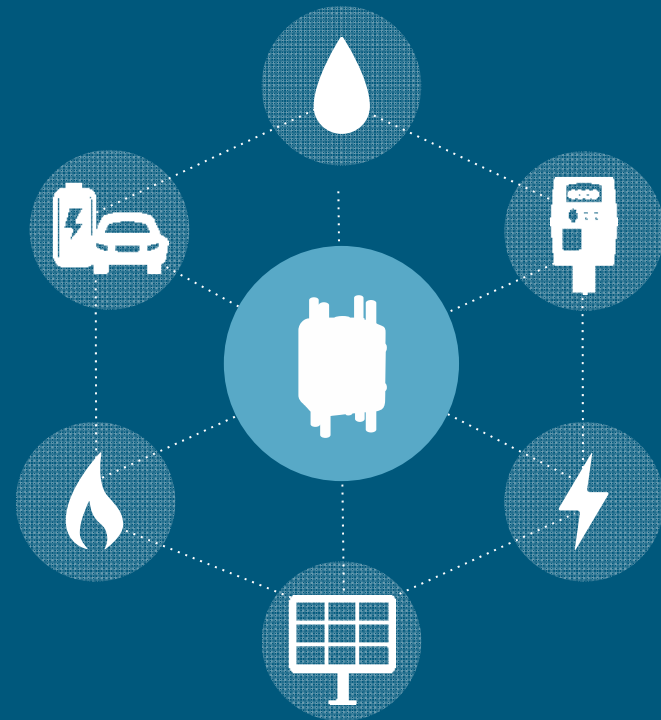


# THE ACTIVE GRID AND SMART CITIES

## A SOLID FOUNDATION

A scalable, secure, reliable communications network is critical to the success of every smart city.

- » Platform for smart city applications
- » Better manage energy and water resources
- » Engage citizens in new ways
- » Improve health and safety





THANK YOU



[www.itron.com](http://www.itron.com)

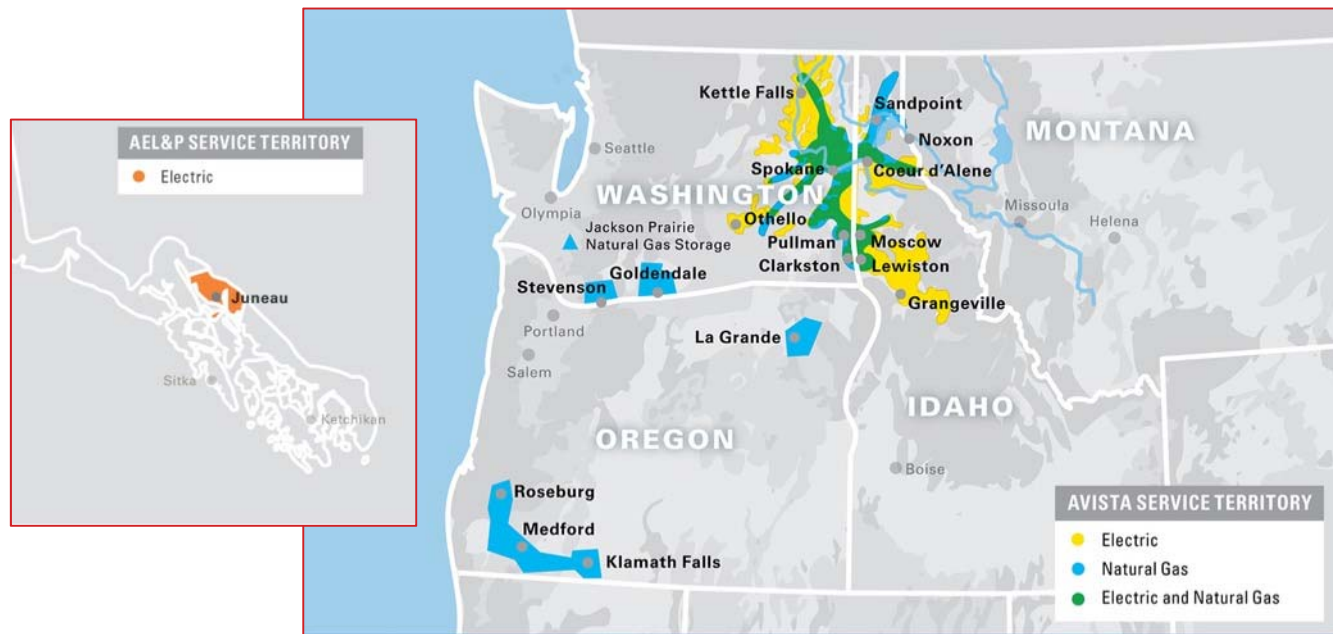




# Imagining the Utility of the Future

Curtis Kirkeby  
*Avista Utilities*

## Avista – A mid-size northwest energy company





## With a 127-Year history of innovation

The Itron logo features the word "Itron" in a bold, red, italicized sans-serif font. A yellow lightning bolt graphic is positioned above the letter "o".The ReliOn logo consists of the word "ReliOn" in a bold, black sans-serif font. A vertical blue line separates "Reli" and "On". Below the line are two blue circles, one containing a white plus sign and the other a white minus sign, with a registered trademark symbol to the right.The ecovā logo features the word "ecovā" in a teal, lowercase sans-serif font. The letter "a" has a macron over it.

1903 Longest transmission line in the world  
1910 Automatic control for electric range  
1911 Automatic electric water heater  
1915 Largest dam in the world with largest generator  
1977 Established Itron  
1983 First bio-mass plant in the world  
1991 Developed first client-server CIS  
1995 Established Ecova (sold to GDF Suez)  
1996 Established Reli-On fuel cell company (sold to Plug Power)  
2001 Developed the first GIS based OMS  
2009-2013 Three ARRA smart grid grants  
2015 Largest vanadium flow battery in north America and Europe  
2015 Largest community solar in WA state

## Applying Design Thinking Methodology



“How Might We...” and **WHY?**



# Technology is changing our lives... and transforming the energy industry

Rapidly emerging technologies are disrupting the way energy is generated, delivered and consumed.





# Energy Industry is Undergoing a Digital Revolution

- Distributive Energy
- Data Analytics
- Internet of Things
- Changing Customer Expectations

*We must be deliberate and intentional if we are to shape how the future of energy evolves.*



# Investing in Grid Modernization



Three ARRA grants in 2009 helped Avista modernize our grid

We invested more than \$80 Million of combined

Avista and federal matching funds:

- **Spokane:** Smart Circuits
- **Pullman:** Smart Grid Demonstration Project
- **Workforce Training:** Next generation to build & maintain our system



# Digitize our Distribution System & Modernize our Grid

- **Improve reliability:** sensors, switches & software detect and isolate outages
- **Power can be restored in minutes instead of hours**
- Customers experience **fewer and shorter outages**
  - 2 Million+ avoided outage minutes
- **Improve energy efficiency**
  - Save 42,000 MWh of energy annually
- **Automate activities** that were performed manually





# Avista's Community Solar Project

- **423 kW Community Solar Project**
- **650 participants**
  - More than tripled the number of Avista customers participating in solar
- Customer Web Tools to **understand solar opportunity**
- **Customers engaged and satisfied**
- Learn about building and operating large scale solar
- Participating in Washington State Congressional Solar Incentive



# Customer Rooftop Solar



## Is Solar Right for Me?

Take the first step towards understanding your solar savings potential. With solar you can produce your own electricity, reduce your electric bill and shrink your carbon footprint.

[Start My Estimate](#)

### How It Works



**Review Personal Estimate**

Find out your solar savings potential based on your rooftop characteristics, your electricity use and available tax credits and incentives.



**Compare Options**

View options side-by-side to understand how different scenarios impact your costs in the near-term and long-term.




**Make an Informed Decision**

If solar seems like a good investment for you, we're here to help you get started.



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### Here is a summary of your personalized solar estimate.

After reviewing your summary, explore the other sections of your estimate to better understand your bill and energy savings potential as well as your financing options.

**Location**

6230 B Moran Dr  
Spokane, WA 99223

This personalized solar estimate factors in specifics about your roof, the available sunlight at your location, your past energy use and applicable state and federal incentives.


Solar System		Monthly	Estimated Annual Savings	
3.25 kW DC system size	13 solar panels	3,960 kWh annual production	29% electricity	27% Avista electric bill

To make changes to your solar system use the [solar menu](#). See more details about this system. For Washington customers using WA-made panels and inverters, a system exceeding 9,250 kWh of annual energy production will exceed the allowable WA state incentive of \$5,000 per year.

Electric bill savings allow you to recover the cost of installing solar and possibly save money in the long run. If you finance your solar system, you will have a loan payment in addition to your utility bill.

### Estimated electricity mix if you go solar.

The chart below shows how much electricity you currently use (the orange line) and the electricity produced by solar (the green area) and purchased from Avista (the blue area).



In this scenario, solar could supply 29% and you would purchase the other 71% from Avista.

You will be eliminating 501 lbs of Carbon Dioxide (CO<sub>2</sub>) per year.

[Click here to see more.](#)



# Avista's EV Experience project

- Avista employees can test drive Electric Vehicle for one week
- 50+ employees tried it
- Survey showed on a scale of 0 to 5:
  - Perception and likelihood to buy was 2.5 before.
  - Increased to 4.7 after they drove the car for one week



# Avista Energy Storage Project

Clean Energy Fund 1

- 1MW – 3.5 MWh Vanadium flow battery
  - Largest capacity vanadium-flow battery in North America and Europe
- Addressing industry challenge: how to integrate intermittent renewables into the electric grid
- Economies of Scope – use the battery every minute of every day
- Create a more reliable, resilient and flexible grid





# Urbanova: Smart City living laboratory

- Collaborative effort with 6 founding partners:
  - Avista, City of Spokane, Itron, McKinstry, University District and WSU
- A **living laboratory** to design cities for the future
- Harness data to gain insights, empower people, solve urban challenges in new ways



# Urbanova Goals

## Our Goals:

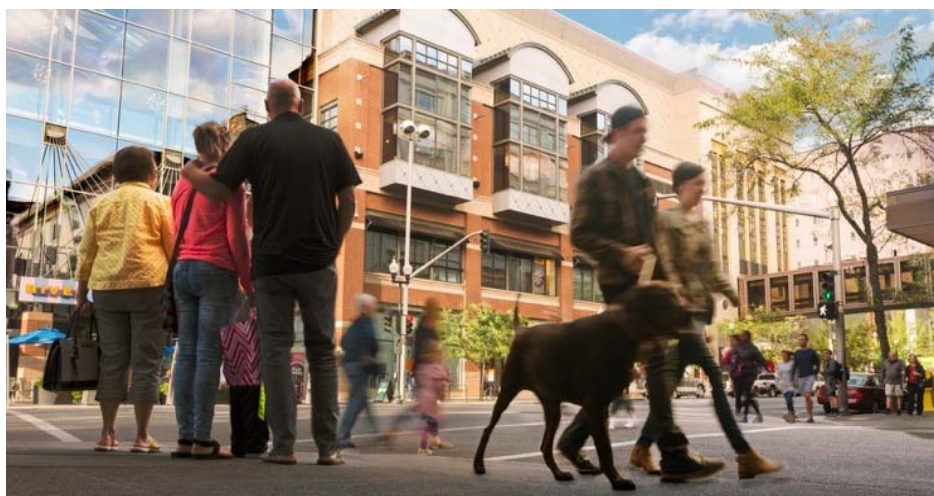
- Healthier citizens
- Safer neighborhoods
- Smarter infrastructure
- More sustainable environment
- Stronger economy



# Urbanova Initial Projects



- Smart and Connected Streetlight Pilot
- Shared Energy Economy Model Pilot
- Smart City Research Grant
  - WSU research health impacts of energy and air quality in urban setting





# Smart and Connected Streetlight Pilot

- Helping define how to develop and design a living laboratory
- Intelligently manage and control streetlights to achieve Urbanova goals
- Human-scale urban air quality R&D component
- Establish data governance for shared information platform
- Central to Envision America participation



# Creating a Shared Energy Economy Model

Clean Energy Fund 2

- Demonstrate how a Shared Energy Economy can benefit both consumer and utility
- Sharing energy assets (e.g. solar panels, battery storage)
- Sharing among consumers, buildings and utility
- Grid becomes more reliable, efficient, resilient and flexible



## How is Urbanova unique?



- Data governance for shared information platform
- Who owns and controls data? How is data secured and shared?
- Platform allows users to explore, visualize and download location-based open data and drive innovation
- Create a proving ground that anyone can utilize and everyone will benefit from
- Possibilities are endless



**IMAGINING THE UTILITY OF THE FUTURE**



A group of people, including children and adults, are holding hands in a circle on a grassy field. The image is slightly blurred and has a dark, textured overlay. The text is centered over the image.

We will embrace change and...  
*Work with customers in new ways  
to forge our energy future **together***



**Thank You**  
QUESTIONS & COMMENTS

