# Value & Risk in the New Energy Era: Rethinking Asset Investment Decisions

June 15, 2017 etsinsights.com



### Agenda

### Copperleaf Technologies Presents: Value& Risk in the New Energy Era: Rethinking Asset Investment Decisions

- Zpryme
- Duke
- Avista
- Copperleaf

### **Thought Leaders**



Copperleaf Technologies Boudewijn Neijens Chief Marketing Officer



#### Avista

Jon Thompson Smart Cities and Utilities Enterprise Architect



Duke Energy

Anjuja Ratnayake Director of Emerging Technology Strategy



Zpryme [Moderator] H. Christine Richards Chief Content Officer &VP of Research



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#### H. Christine Richards

Chief Content Officer & VP of Research [Moderator]



Zpryme

### **DERs Will Bring Change to Utilities—Its Already Begun**



zpryme

### IoT is Bringing Change to Utilities As Well



31%

have a comprehensive plan for IoT of utilities believe that IoT is an important technology trend





believe microgrids compete with traditional utility business model. think microgrids will reduce utility load in the future. Utilities must adapt to changing regulations, maintain the reliability of their infrastructure, and focus on activities that deliver shareholder value all while investing in new technologies and services to build new revenue streams.





Anuja Ratnayake Director of Emerging Technology Strategy

Duke Energy





### **Rethinking Asset Investment Decisions**

Anuja Ratnayake Director, Emerging Technology Strategy June 14, 2017

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# We power 23 million lives

- We're a regulated energy provider in Indiana, Kentucky, Florida, Ohio, North Carolina and South Carolina:
  - 7.4 million retail electric customer accounts – impacting about 23 million lives
  - 1.5 million retail natural gas customer accounts
- We also:
  - Own and operate wind and solar farms across the U.S., where the power generated is sold to regional utilities



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# Leading the way to cleaner, smarter energy solutions that customers value



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# **Emerging Technology Trends**



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# Vertically Integrated Utilities planning must consider value across the system



Will require...

- Granular, long-term view of base forecasts
- Longer-term view of system needs
- Stacking benefits based on functional capabilities of emerging technologies
- Multi-year investment portfolios combining wires and non-wires solutions

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**Jon Thompson** Smart Cities and Utlities Enterprise Architect

Avista





Jon Thompson Smart Cities and Utilities Enterprise Architect, Avista Utilities



Avista

Value and Risk in the New Energy Era | Rethinking Asset Investment Decisions

Zypryme ETS Insights Webinar | June 15, 2017

### About Avista

WASHINGTON WATER POWER

#### Kettle Falls Sandpoint MONTANA Noxon Seattle Coeur d'Alene Spokane WASH Cal 10 Olympia Missoula Othello Helena Jackson Prairie Pullman Moscow 🔺 Natural Gas Storage Clarkston Lewiston Goldendale Stevenson Grangeville Portland La Grande 0 **IDAHO** Salem OREGON AVISTA SERVICE TERRITORY Boise Roseburg Electric Natural Gas Medford Electric and Natural Gas **Klamath Falls**

#### Customers

Over 374,000 Retail Electric Customers
Over 336,000 Natural Gas Customers

#### Distribution

o 19,000 miles of electric distribution line

o 7,700 miles natural gas distribution mains

o 160 Electric Substations

o 65 Natural Gas Gate Stations

#### Transmission

Over 2,700 miles transmission
Hourly Average System Load 1000 MW

#### Generation

1861 MW Generation Capability
49% Hydro (8 Plants)
35% Natural Gas
9.5% Coal
4.5% Wind
2% Biomass

# Our Changing Landscape

#### Generation

Physical Security Local & Remote Plant Operations Automatic Generation Control Environmental Stewardship Asset Management Inspection & Maintenance Public Alerting System Generation Dispatch

#### Substation

Physical Security Asset Mgmt. Configuration Mgmt. Inspection & Maintenance System Integration System Protection Interchange Metering

#### **Electric Distribution**

Grid Modernization / Smart Grid Distribution Grid Management Distribution Automation Inspection & Maintenance Asset Management EV Charging Stations Smart LED Street Lights Veg. Mgmt., Pole. Mgmt. Trouble Response

#### Customer

Customer Engagement, Interaction, and Information Demand-side Management, Demand Response Energy Efficiency (Behind the Meter / Customer) Energy, Energy Services, and Choices Plug-in Electric Vehicle Integration Customer Tools, Portals HAN/BAN Interface Customer Projects Emergency Response

Avista's Future Utility Landscape 2025

#### Transmission

System Protection (Various Schemes) Synchrophasors / PMU EMS SCADA Asset Management Inspection & Maintenance Vegetation Management Wide-Area Situational Awareness Network Model Validation

#### Gas Gate Station

Gas Sensors Interchange Metering Gas Safety & Compliance Gas Design Planning Gas Emergency Response Analysis & Forecasting Asset Management Inspection & Maintenance

#### Gas Distribution

Gas Sensors Gas Safety & Compliance Gas Design & Planning Integrity Management Inspection & Maintenance Mobile Workforce Gas Emergency Response Asset Management

#### Advanced Metering Infrastructure (AMI)

Electric & Gas Metering On-Demand and Interval Reads Enhanced Outage Mgmt. Remote Service Disconnect, Reconnect Dynamic Pricing & Time of Use Rates Residential Demand Response Interface to HAN/BAN Revenue Protection (Theft, Failed Meters)

#### Distributed Energy Resources (DER)

Smart Inverters Inter-Systems Interface Energy Storage Microgrids Virtual Power Plant Generation Dispatch Renewables Integration Asset Management Inspection & Maintenance Competitive Retail Supplier

# Investment Challenges



### Possible End States for the Grid



Source: Paul De Martini

### **Our Journey - Smart Grid Demonstration Project**



### Energy Storage Project



# Shared Energy Economy Project

- Distribution System Platform
- Peer-to-Peer Transactive Energy
- Building-to-Grid Integration
- Microgrid and DER Management
- Value Stacking and Optimization
- Solar Photovoltaics
- Energy Storage
- Smart Inverter
- Distributed and Edge Analytics
- Cyber Resiliency



### Ubanova – Smart City Living Lab



#### "This is an opportunity to innovate at a whole new level."

Heather Rosentrater, vice president, energy delivery, Avista











WASHINGTON STATE I JNIVERSITY

http://urbanova.org





Chief Marketing Officer

Boudewijn Neijens

### Copperleaf







# **ASSET INVESTMENT DECISIONS**

Boudewijn Neijens - Copperleaf

# **BUSINESS AS USUAL?**



#### Challenges

- Customer Expectations
- Alternatives
- Uncertainty
- Predictions
- Stakeholders
- Resource Reallocation

#### Factors

- Consumer & Societal Benefits
- Renewables, Non-wire, Storage
- Economical, Political
- Growth, Technology
- Regulatory, "Broad Prosperity"
- Sustainment vs. Change

### **DECISIONS, DECISIONS...**





# ISO 55001 – The Management System



- Value
  - Assets exist to provide value to the organization and its stakeholders
  - Asset management enables realization of value
- Alignment ("Line of Sight")
  - Asset management objectives align with organizational objectives
  - Asset management decisions, plans and activities (technical, financial and operational) collectively enable the achievement of AM objectives

- Leadership
  - Leadership and culture are determinants of realization of value
- Assurance
  - AM gives assurance that assets will fulfill their required purpose
  - Assurance is derived from effective governance, controlled processes and robust management of risks



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### FRAMEWORK





© The IAM

### PROCESS



- Remove the emotions
  - Transparency & defensibility
  - Collaborative: buy-in
- Add rigor
  - Involve the right stakeholders
  - Compare apples to oranges
- The time factor
  - Whole life approach
  - Dynamic (re-)evaluation

- Leave nobody & nothing behind
  - Predict
  - Capture all ideas & needs
- Governance
  - Approvals
  - Repeatable
  - Auditable

# DECISIONS



- Data driven
  - You can't manage what you can't measure
- Options/alternatives
  - One problem, multiple possible solutions
- Scenarios
  - What-if & sensitivity

- Time-dependent
  - The cost of not doing, of delaying
- Portfolios
  - Multiple constraints not only monetary
  - Deciding where your resources (should) go



### **ASSET INVESTMENT PLANNING & MANAGEMENT**







# **SUMMARY**



- Value
  - Not only cost and risk!
  - Build a common scale for all value measures
  - Whole life approach
- Alignment
  - Value measures must fairly represent organizational objectives
  - Ensure all plans & investments are measured accordingly

- Leadership
  - Buy-in & consistency
  - Support from top management
  - Gradual approach
- Assurance
  - Transparent, auditable process
  - Best practices
    - Data driven
    - Dynamic in time
    - Optioneering
    - Portfolios & Scenarios





## THANK YOU



- Contact: <u>BNeijens@copperleaf.com</u>
- White Papers: <u>www.copperleaf.com</u>
- ISO 55000: <u>committee.iso.org/TC251</u>
- Guidelines: <u>www.theiam.org</u>

### Thank you!

# Thank you for attending. Please share your questions with our thought leaders:



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