

Houston's Smart Grid:

Transforming the Future of Electric Distribution & Energy Consumption

Measurable Benefits of our Smart Grid

November 2019



CNP's Grid Modernization Journey

✓ Advanced Metering System
2009 - 2012

✓ Customer Vision Platform
2012

✓ Analytics/Situational
Awareness 2012

✓ Intelligent Grid
2011-2014

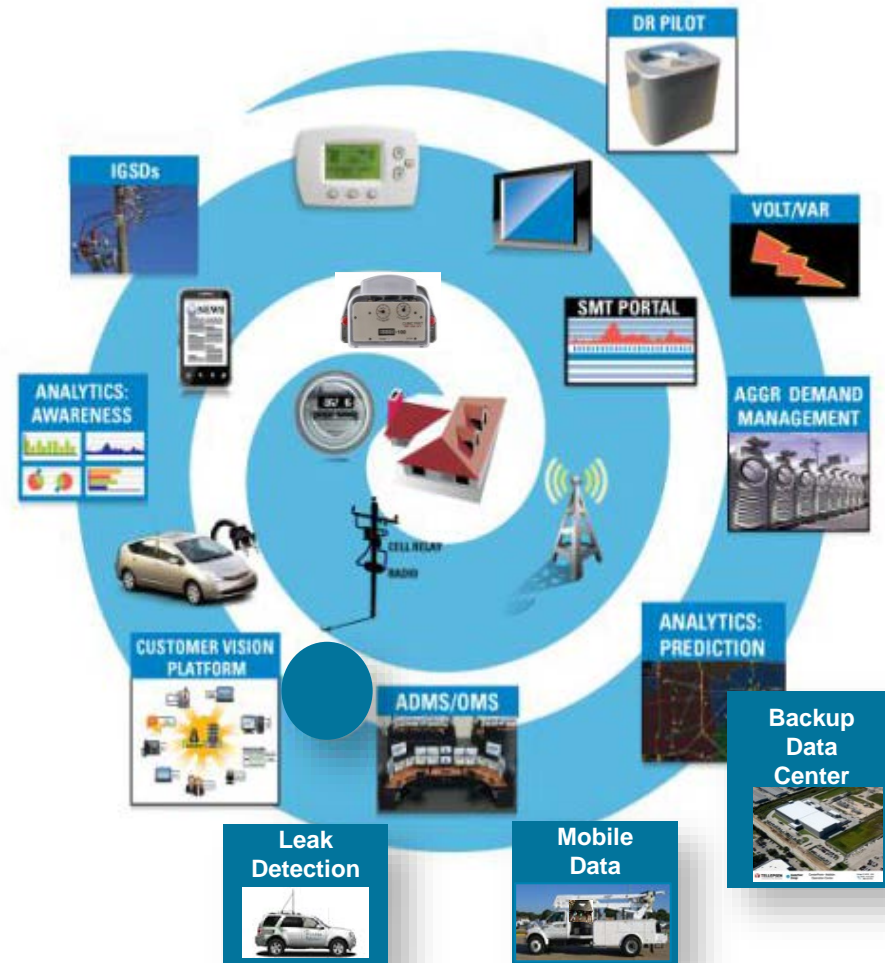
✓ Advanced Distribution
Management System
2012-2015

✓ Mobile Workforce
Enablement 2014

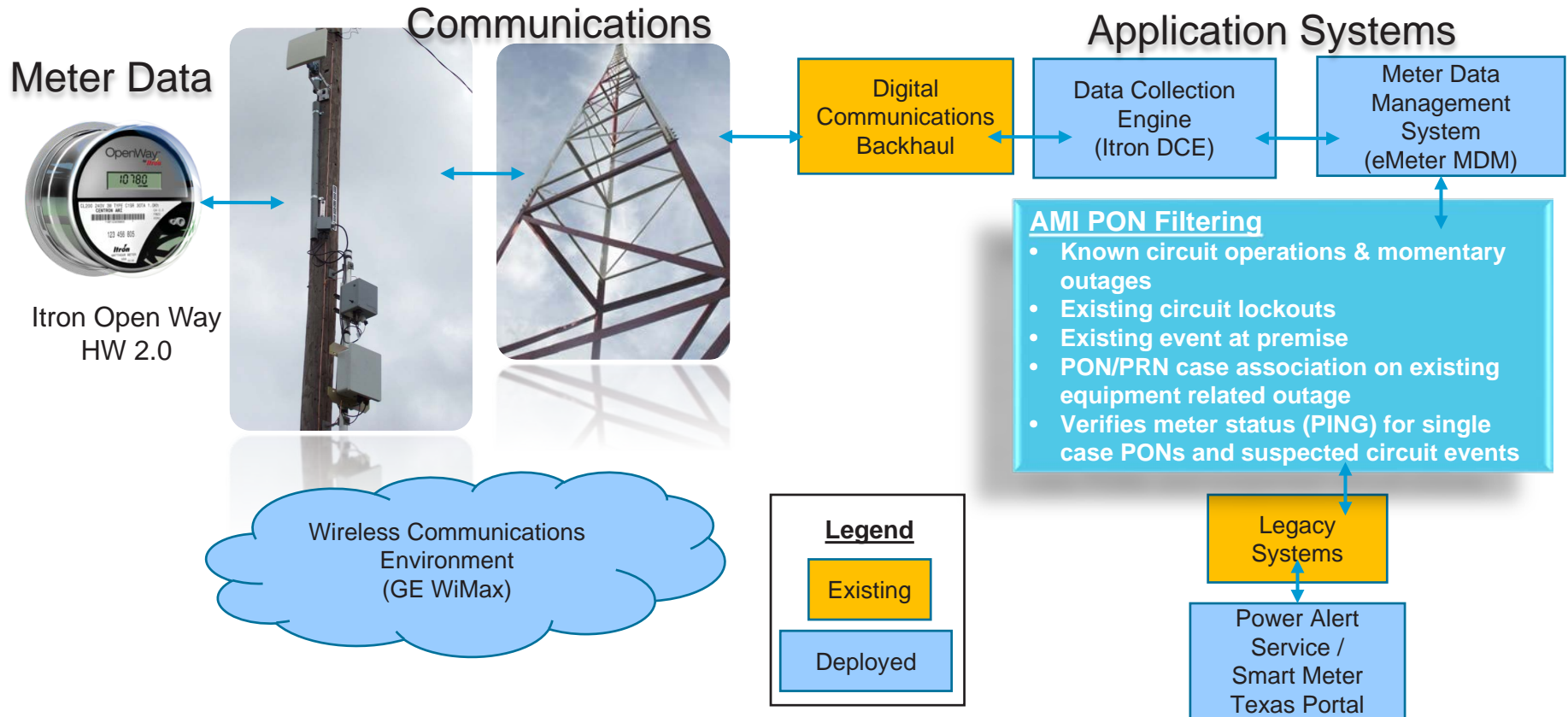
✓ Asset Management - In
Progress

☐ To Do:
Intelligent Energy Future

- Reliable, resilient
- Affordable, customer choice
- Integrate DER
- Safe, secure



COMPONENTS OF OUR ADVANCED METERING SYSTEM (AMS)



Combined with back office computer systems and integration, our AMS provides:

- Daily register reads
- Daily 15 minute interval reads
- Remote connect / disconnect / on-demand reads
- Access to data via Smart Meter Texas portal



ADVANCED METERING SYSTEM BENEFITS



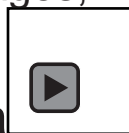
- **Remote meter reads, service connection/disconnection**
 - \$20-25 million in consumer savings annually from eliminated fees
 - 19,450,211 remote service orders
 - 1,945,021 gallons of fuel saved
 - 17,523 tons CO₂ emissions avoided
- **Energy efficiency and savings**
 - Biggest Energy Saver winners reduced 36-50%, 332 in '13 averaged 3%
 - 50-70% getting data from SMT, IHDs, REP emails changed usage behavior
- **New products and services**
 - > 700,000 Texans on time-of-use rates (free nights & weekends) or peak-time rebates (source = ERCOT)
 - 3,453 Houstonians and 6,213 Texans get near-real-time data from In-Home Displays
- **Power Alert Service**
 - 1,242,411 CNP customers get outage alerts by email/text/phone
- **75% of surveyed consumers viewed CNP's smart grid favorably**
 - Only 5% viewed it unfavorably

POWER ALERT SERVICE

AMS METER POWER-OFF/POWER-RESTORED NOTIFICATIONS



- 1.24 million consumers enrolled for alerts via email/phone/text
- > 15 million messages sent
 - registration messages,
 - outage and restoration messages,
 - status updates.
- Up to 95% call deflection rate



Customer Feedback

- “Bravo, CenterPoint. Bravo. From start to finish, we were kept informed without having to listen to a second of hold music. The notice also included a link to an interactive map of current outages in the city. Remarkable.” – *Houston Press blog*
- “Love that @EnergyInsights is now emailing me when the power is out at home. And just received email that the power has been restored.” – *Troy on Twitter*
- “Thanks to [@CNPalerts](#) for the useful SMS and email updates on my neighborhood's power outage. Good to know technology used for good! – *Everard on Twitter*
- Survey results
 - 92% ease of registration/use
 - 93% timely restoration alert
 - 92% satisfaction

INTELLIGENT GRID (IG) COMPONENTS

BENEFITS 2011 – OCT 2019



	Distribution Automation
Outage Events	2,857
Customer Outage Minutes Avoided by Automation	324 million
Sustained Customer Outages Avoided	>1,667,000
Average Reliability Improvement using IG	23.4%



While construction to date covers about 25 percent of CenterPoint Energy's service area, automation improvements benefit consumers in the entire system.

HURRICANE HARVEY – A RECORD-BREAKING STORM



- After making landfall as a Category 4 storm near Port Aransas, Texas, Hurricane Harvey stalled, impacting south Texas, southeast Texas and Louisiana for days



- Maximum sustained winds were **130 mph winds** at landfall
- **51.88 inches** of rainfall in southeast Texas, breaking the single-storm record of 48 inches set in 1978 and more than 10-year annual average



- More than **42,000** lightning strikes across electric service territory
- Harvey spawned tornadoes in southeast Texas, Louisiana, Alabama, Mississippi, Tennessee and North Carolina

HARVEY BY THE NUMBERS

ELECTRIC OPERATIONS RESPONSE



- **293** total electric circuits locked out and **4,494** total electric fuses out
- **8** substations out of service and **9** substations inaccessible due to high water
- More than **2,200** employees plus **1,500** contractors & mutual assistance personnel from **7** states
- **308** SAIDI minutes with **1.2 million** customers impacted
- **755 million** total minutes out over 10 days



IMPACT OF GRID MODERNIZATION

BENEFITS OF ADVANCED METERING SYSTEM (AMS) AND INTELLIGENT GRID



- The Smart Grid, including distribution automation devices such as intelligent grid switches, allowed us to quickly isolate problems on our grid and restore service to customers through those devices.
 - Operated more than **250** of these devices during the event impacting more than **140,000 customers**
 - Were able to avoid almost **41 million outage minutes** for our customers
 - **16.71 SAIDI minutes** saved due to automation
- AMS meters increased efficiency during the storm
 - Executed **45,000 orders** remotely at **97% performance**
 - Billed **700,000 accounts** with actual readings at **98.9% performance**
 - Executed remote turn off/on for safety reasons
- Use of real-time analytics to assess, monitor and resolve cases
 - Aided in developing better situational awareness
 - Allowed us to correlate weather and flooding information with outages, providing operations with critical decision-making tools



