



Smart Meter Public Informational Meeting

October 15, 2019

Brief History

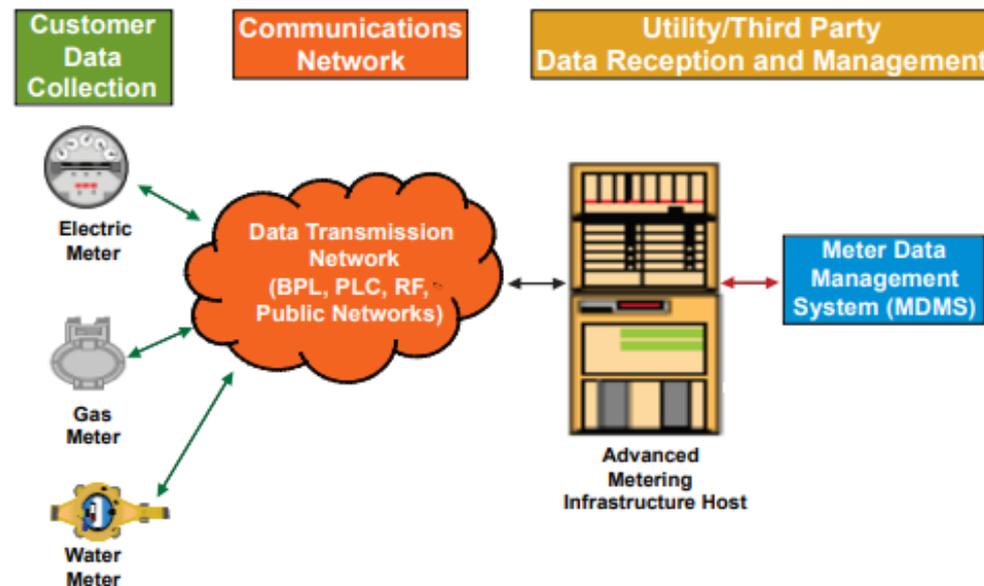
- The advent of automatic meter reading (AMR) came about in the mid-'80s, and more prominently in the early 1990s as an automated way to collect basic meter-reading data.
- In 2002, the City started the implementation of Automatic Meter Reading (AMR).
- The AMR was completed in 2006 serving 5,543 electric and 5,649 water customers.
- The term and technology behind advanced metering infrastructure (AMI) began showing itself around 2005, evolving from the foundations of AMR.
- Today, the City serves 8,832 electric and 7,590 water customers. The majority of residential water meters are over 15 years old and in need of replacement.



What is AMI?

Advanced Metering Infrastructure (AMI) is not a single technology implementation, but rather an integration of state-of-the-art electronic/digital hardware and software, which combines interval data measurement with continuously available remote communications.

A typical AMI system looks like this:



Benefits

Benefits associated with AMI deployment can be broadly categorized as:

System Operation Benefits

- no manual reads
- increased meter reading accuracy
- improved utility asset management
- easier energy theft detection
- easier outage management.

Customer Service Benefits

- Better awareness of energy and water usage
- early detection of meter failures,
- billing accuracy improvements
- quicker restorations

Financial Benefits - these accrue to the utility from

- reduced equipment and equipment maintenance costs,
- reduced support expenses
- faster restoration and shorter outages
- improvements in inventory management.



Technology and Company Overview

nEXgrid[®]

The logo for nEXgrid features the word 'nEXgrid' in a bold, sans-serif font. The 'nEX' is green and the 'grid' is blue. Above the 'i' in 'grid' is a blue wireless signal icon consisting of three curved lines and a central dot.

innovative smart grid solutions

Gardner KS



Nexgrid's platform improves the way utilities and consumers manage and monitor energy using advanced smart grid technology

- Founded in 2008 with a focus of simplifying smart grid and advanced metering
- Corporate office in Fredericksburg, VA
- 6 Industry Specific Patents
- Selected by Electricities of NC as vendor of choice from over 50 RFP respondents
- Chosen by HD Supply as their municipal and co-operative smart grid solution



Easy to manage, operate and expand

A system designed for simplicity and scalability



100% standardized broadband network

Single platform for multi-utility metering, smart devices and future



Multi-meter vendor support.

Support for all major meter vendors as well as multi-vendor meters on the same network.



1 Software platform

Electric, water, gas, MDM, GIS, customer portal, outage management, street light, load control and asset management



Backward compatible with ongoing updates

Same software and firmware versions in all of Nexgrids deployments. Customers receive ongoing system upgrades, security patches and performance updates

System Overview

- Smart grid infrastructure
- Smart meters
- Power output levels

Nexgrid's ecosystem



Head End

Infrastructure

Metering

Smart Home

Software



Complete End to End Solution

Easy to install NEMA (ANSI C136.41) twist lock

intelaMetering



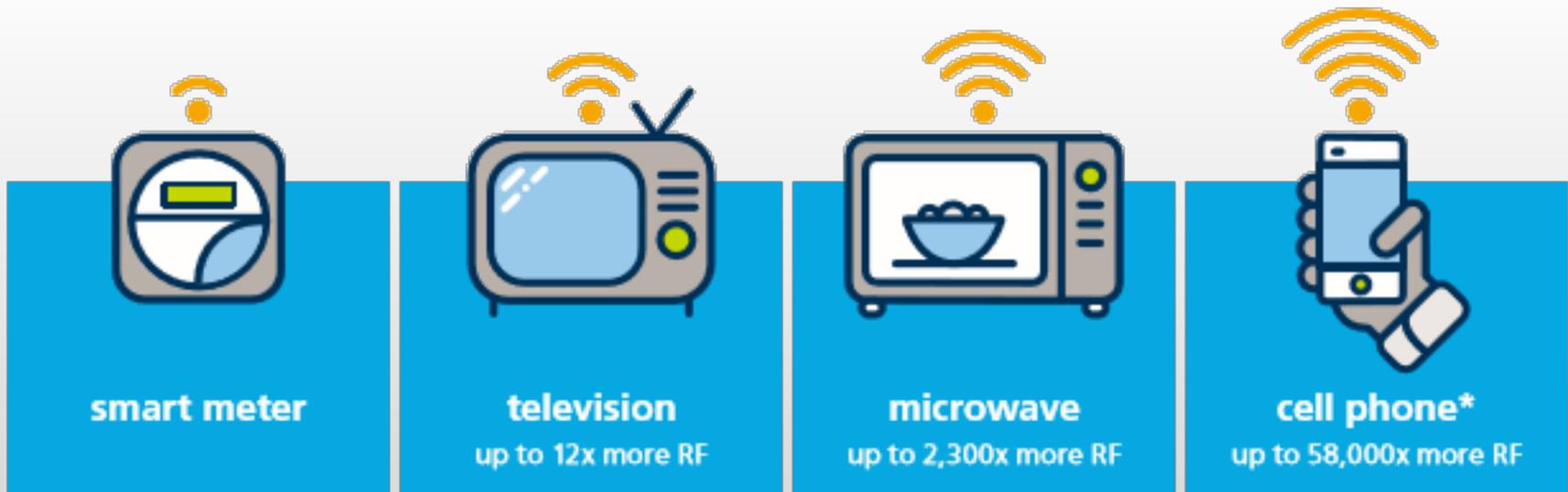
- Advanced metering of **electric water and gas**.
- Self-provisioning, Over The air upgrades
- On board memory storage (90 days of reads)
- Power outage/tamper/vibration and leak detection
- Standardized wireless communication 2.4 GHz
- Secure (FIPS 140-2)
- Multi-vendor meter support



Radio Frequency



Nexgrid's Plexus network utilizes the 2.4 GHz frequency band, coexisting with Wi-Fi, Bluetooth and other Smart Home technology's that use this frequency. Power levels automatically change to adapt to real time conditions.



Source: EPRI

Commonly Used Devices

Power Output Levels



Fit Bit
.25 mW



Airpods 2
9.6-21 mW



Nexgrid Meter
38-100 mW



Apple Watch
38 -300 mW



Vtech Phone
97 mW



Fit Bit Versa 2
8.9 mW



iPhone 11 Wi-Fi
278 mW



iPhone XR Cellular
370 mW

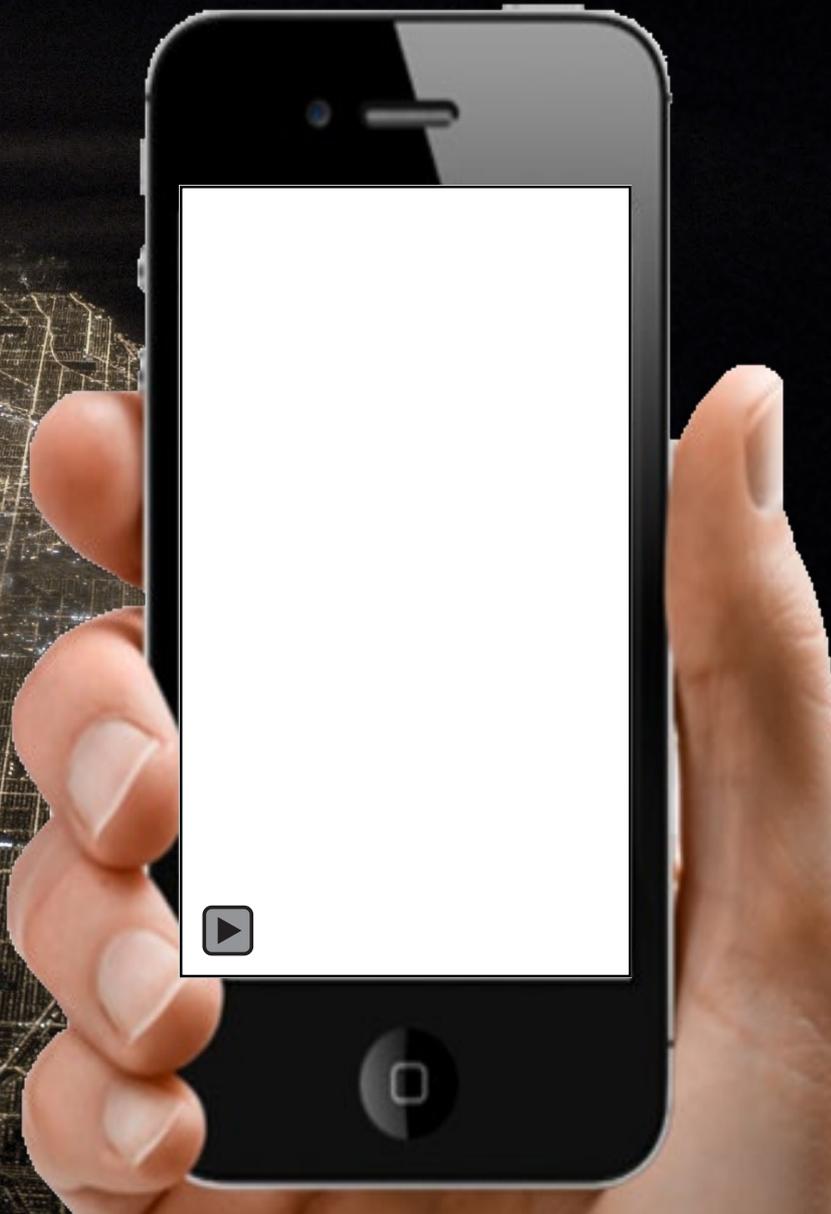
Source: FCC ID Website www.fcc.io

Utility Benefits

- Automated meter reading
- Power grid management
- Transformer monitoring
- Outage management
- Street light maintenance

One software platform to manage the entire smart grid network.

- Enterprise Management Software
- Electric, Water and Gas Metering
- Network Management
- Outage Management
- Streetlight Management
- Load Control



Power grid monitoring



Transformer demand: Aggregating meter usage data provides transformer demand

End of line voltage: Combining ecoOnes GIS and voltage data the system provides end of line voltage

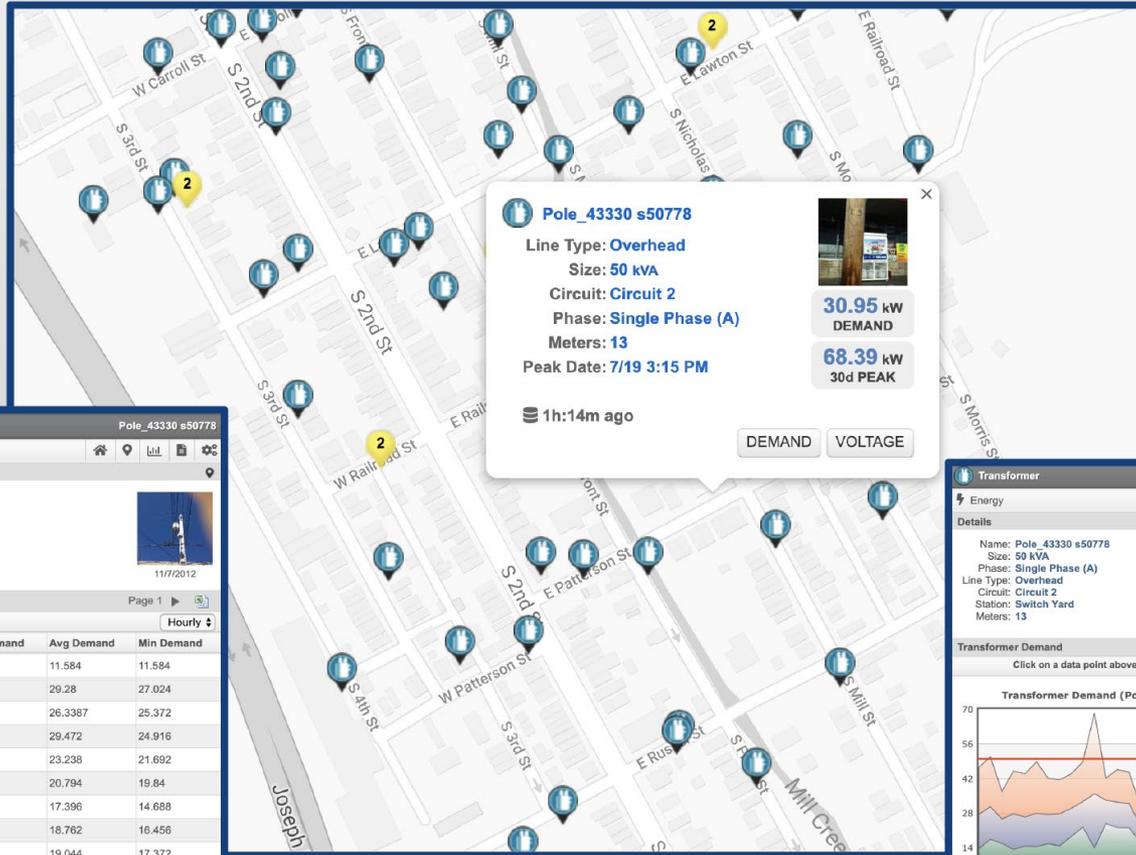
Outage management: Outage data combined with ecoOnes GIS provides more detailed information on outage events including transformer, circuit, reclosers and phase

Load balancing: Historical circuit demand by phase provides circuit load balancing data

Predictive usage: based on historical usage data, time and weather conditions ecoOne provides predictive hourly usage for up to 72 hours on meters, transformers, circuits and substations.

Transformer Monitoring

Transformer Management



Pole_43330 s50778

Line Type: **Overhead**
 Size: **50 kVA**
 Circuit: **Circuit 2**
 Phase: **Single Phase (A)**
 Meters: **13**
 Peak Date: **7/19 3:15 PM**

1h:14m ago

30.95 kW DEMAND
68.39 kW 30d PEAK

DEMAND VOLTAGE

Transformer Pole_43330 s50778

Energy

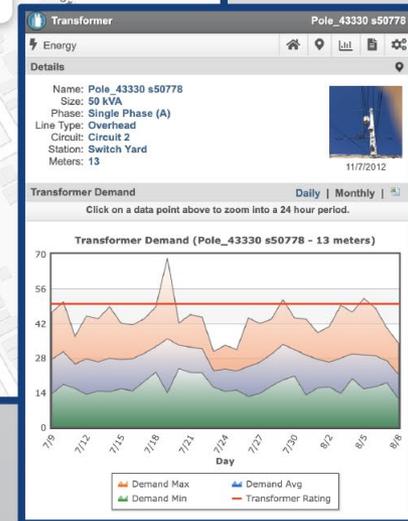
Details

Name: Pole_43330 s50778
 Size: 50 kVA
 Phase: Single Phase (A)
 Line Type: Overhead
 Circuit: Circuit 2
 Station: Switch Yard
 Meters: 13

Transformer History

Time	Max Demand	Avg Demand	Min Demand
08/8/19 12:00:00 PM	11.584	11.584	11.584
08/8/19 11:00:00 AM	30.952	29.28	27.024
08/8/19 10:00:00 AM	27.204	26.3387	25.372
08/8/19 09:00:00 AM	34.028	29.472	24.916
08/8/19 08:00:00 AM	26.052	23.238	21.692
08/8/19 07:00:00 AM	21.748	20.794	19.84
08/8/19 06:00:00 AM	18.324	17.396	14.688
08/8/19 05:00:00 AM	23.34	18.762	16.456
08/8/19 04:00:00 AM	21.024	19.044	17.372
08/8/19 03:00:00 AM	18.832	18.7507	18.648
08/8/19 02:00:00 AM	20.56	20.56	20.56
08/8/19 01:00:00 AM	20.868	20.868	20.868
08/8/19 12:00:00 AM	23.744	22.297	21.016
08/7/19 11:00:00 PM	21.92	20.4853	18.996

Transformer Usage



Monthly Demand

Transformer Mapping

Outage Management



ecoOne Smart City 80°F 4mph

Dashboard Views Reports Settings Help Search

Event Outage Summary

Outage (Event 545924) 5 Meters
TUE 4:03 PM 1h 8m 36s
REPORTED DURATION

Average Outage Time

Outage By Circuit

Meter Outages

Time	Meter Outages
4:03:03 PM	1
4:03:06 PM	2
4:03:11 PM	4
4:03:14 PM	5
4:03:25 PM	5
4:05:35 PM	4
4:08:30 PM	3

Meter Outage Map

Map data ©2019, 200 m

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Street Light Management



ecoNet SL

Streetlight

Details

Product Type: ecoNet SL
MAC: 68:72:51:6C:0B:11
IP: 5.108.11.17
Routing Mode: MPOR
Firmware: 4.2.9 | 4.86 | F:4.86
Activation Date: 8/8/2017 10:08 AM

Device Alerts ecoNet

	Type	Description	Time	Ack
1	⚠ Streetlight	Streetlight no current	10/14 7:15 PM	✅

- Street Scheduling
- Maintenance Alerts
- Remote Control
- Electrical monitoring: V, W, and Wh.
- Advanced data synchronization and notification mechanism.

Water Leak Detection



intelaMeter **1 Operational Alert** LISA L IVEY

Water Home Location Chart Document Run Settings Lock

Details Progress Location

Customer: **LISA L IVEY**
Address: **720 T L OUVERTURE**
Serial: **80342567**
Model: **Standard Water**
EUI 64: **000D6F000B4AC58A**
Install Date: **5/24/2016 12:15 AM**
Profile: **Saver Mode**

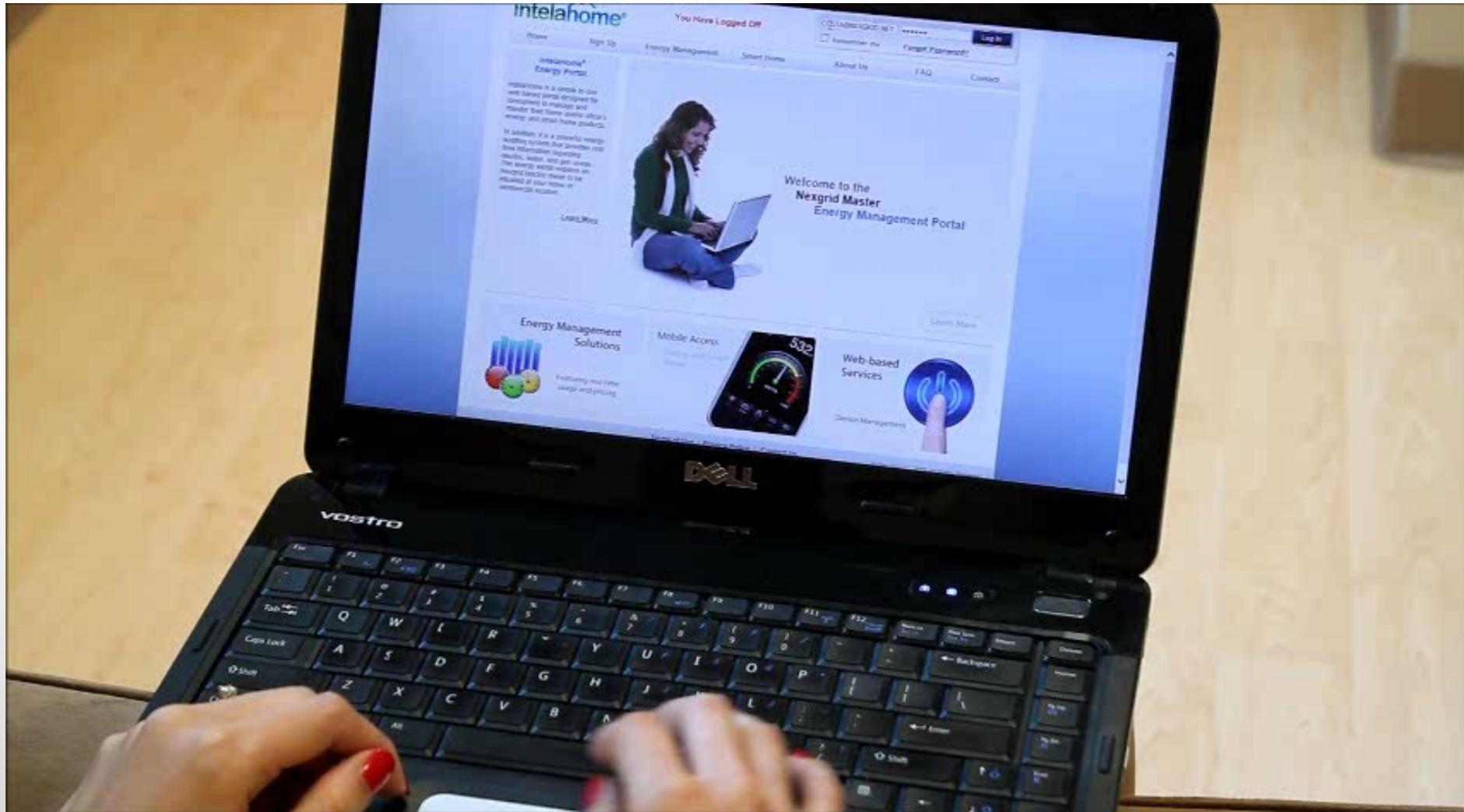


Operational Alerts Total: 1

	Type	Description	Time
1	Water	Potential Leak Detected: Constant flow of 45.58 gallons over 24 hours detected	6h:7m ago

Customer Benefits

- Customer web portal
- Mobile app
- Amazon Alexa
- Text and email notifications



Amazon Alexa support



Support for all Alexa devices.



Consumer services:

“Tell me details of my energy bill”

“How much energy are we using right now?”

“Am I on budget for my electric usage this month?”

“How much water am I using”

“What's the balance on my prepay account”

intelaHome Notifications



Subscribe to text and/or email alerts

Supported Notifications:

- Power outage
- Power restore
- Water leak
- Prepay alerts
- Goal Alerts



Thank You!



Questions?

