

Disruptive Trends and New Technology in the Energy Industry

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disclaimer & confidentiality

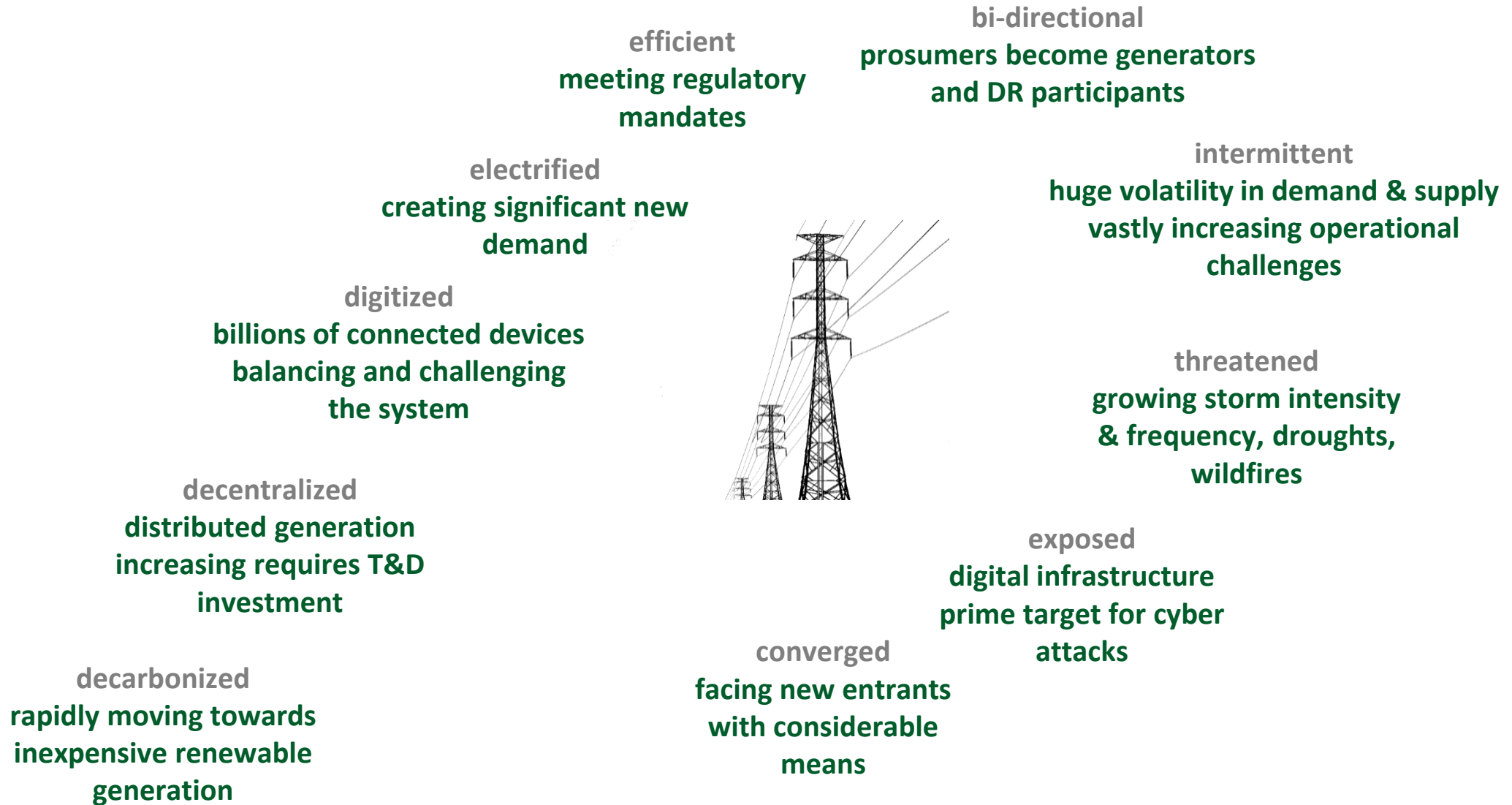
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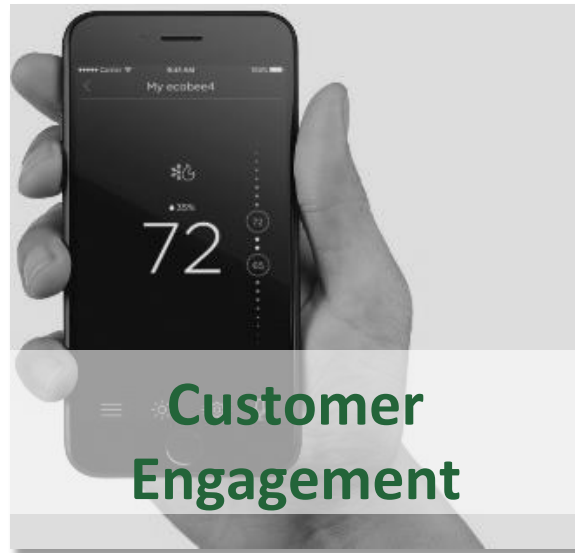
EIP at a glance **powering innovation**

- **World's Largest Technology Fund Focused on the Conversion of the \$20 Trillion+ Energy Industry**
Electrons - the fuel of the future: Decarbonized. Decentralized. Digital. Electrified.
- **A Fund by Utilities and for Utilities to Foster Innovation**
Fund I - 16+ partners with global reach of 180 million customers, \$300b+ market cap, \$60b+ capex
- **Investing in Key Building Blocks for the Utility of the Future**
Intelligent Operations. Mobility. Electrification. Customer Engagement. Cybersecurity. Resilience.
- **Using a Collaborative Approach that Maximizes Strategic Value for our Partners**
Collaboration. Strategic Investing. Information & Advice. Business Development
- **Strategic Value Add Validated by our Partners through Feedback and Recommitment in Fund II**
Strong endorsement through references and surveys. More importantly high reinvestment ratio.
- **Proven Track Record with Strong Financial Performance. Turning an Operating Cost into a Profit Center**
26 Relevant Transactions. \$681mm AUM. Top quartile financial performance. 3 strong exits.

challenges & opportunities **an increasingly complex future for utilities**



our focus **key sectors of the transformation**



elevated by the **world's largest utility innovation coalition**



our coalition **offering unparalleled leverage**



180m households

equivalent to nearly 2/3 of the entire US market



1.5m miles of wires

enough to circle the globe 60 times



\$300b+ market cap

including several of the world's most valuable utilities



\$60b+ annual capex

20x US VC investment in energy technology



305+ GW generation

representing 30% of net generation in the United States



\$225b+ revenues

more than Amazon, Google, Tesla & Microsoft combined

portfolio at a glance



Intelligent Operations



Customer Engagement



Distributed Energy Resources



Mobility & Electrification



Smart Cities & Buildings



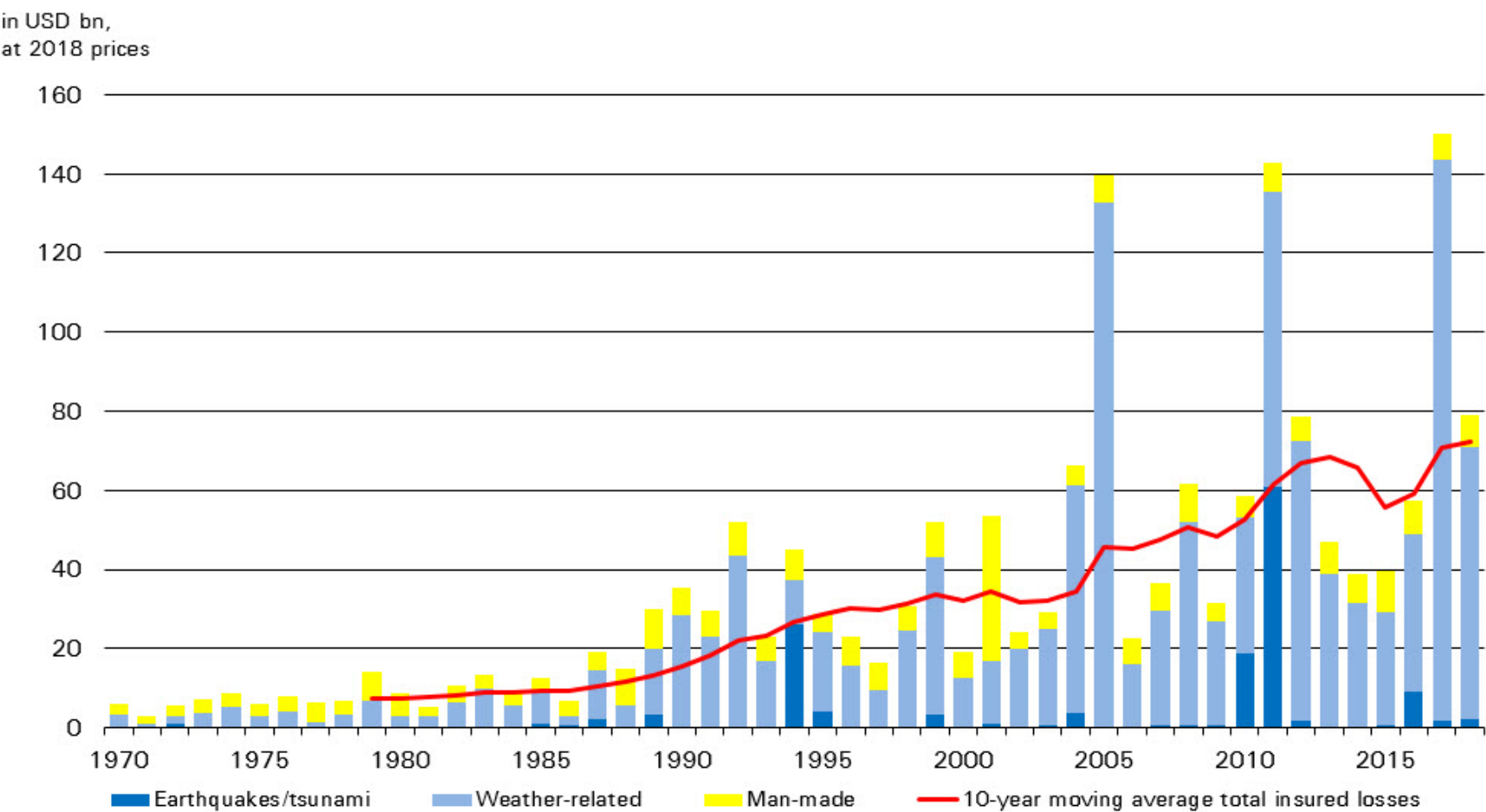
Cybersecurity



Intelligent operations

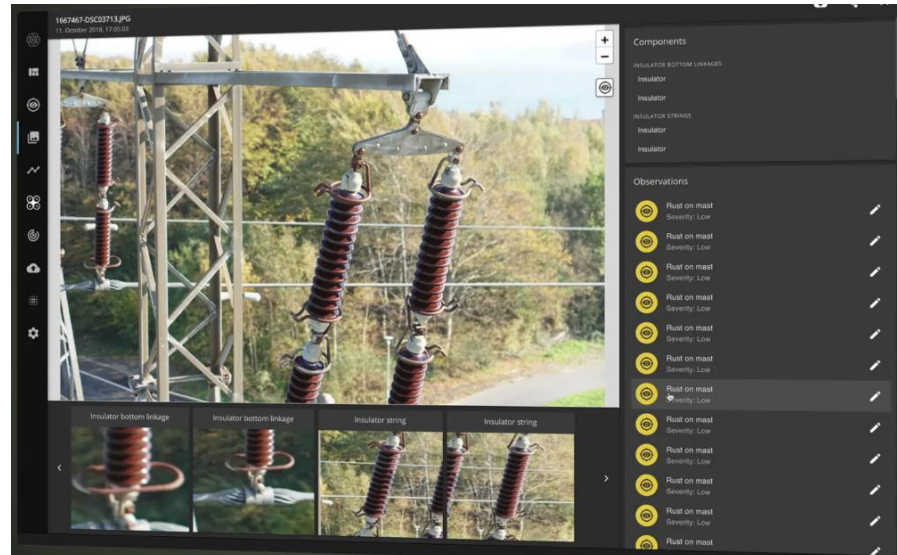
disruptive trend: **increasing risks to utility infrastructure**

The cost of natural disasters is growing due to intensifying floods, wildfires, and hurricanes



Source: SwissRE

eSmart Systems enables cheaper, more frequent, more accurate inspections of the grid via drone imagery

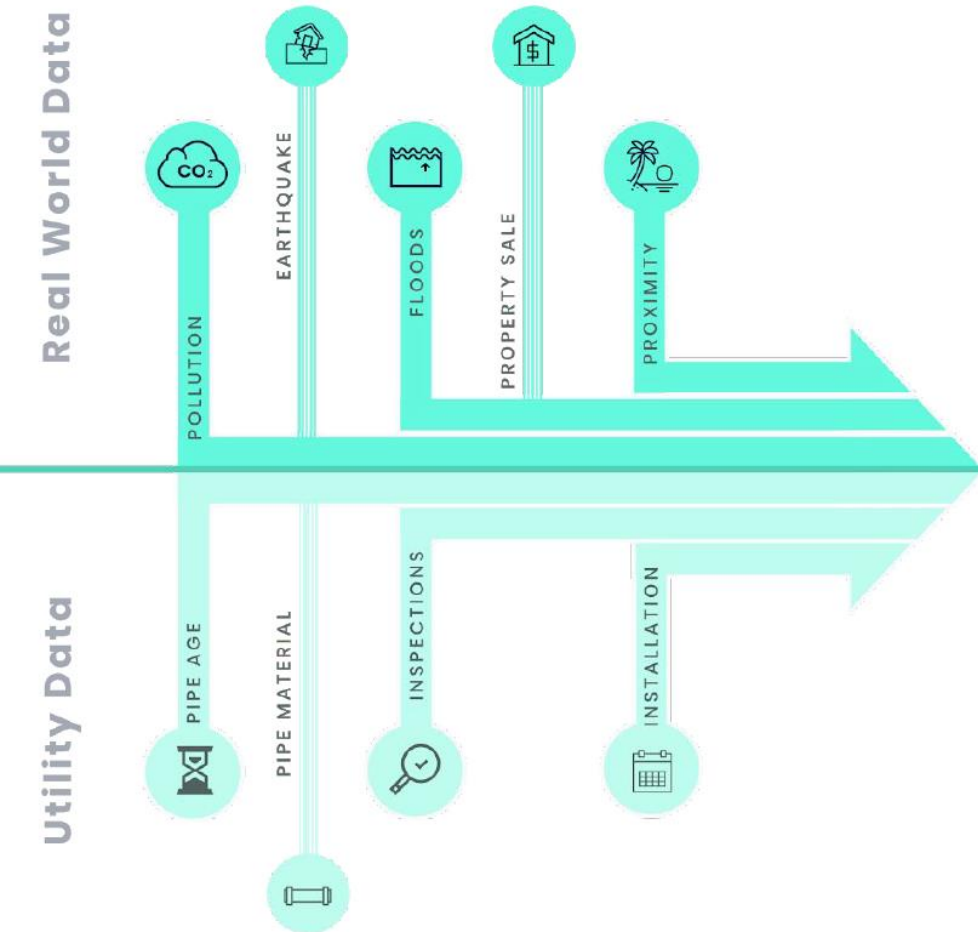


eSmart Systems identifies rust, worn insulators, damaged strands, and other maintenance issues by running machine vision algorithms on imagery collected from drones

By deploying eSmart's solution to collect aerial imagery data and automatically analyze the images, Alliant expects to reduce inspection truck rolls by 60%

Urbint

combining AI and data from the built environment to **solve major utility infrastructure challenges**



Artificial Intelligence



Pinpointed Risk

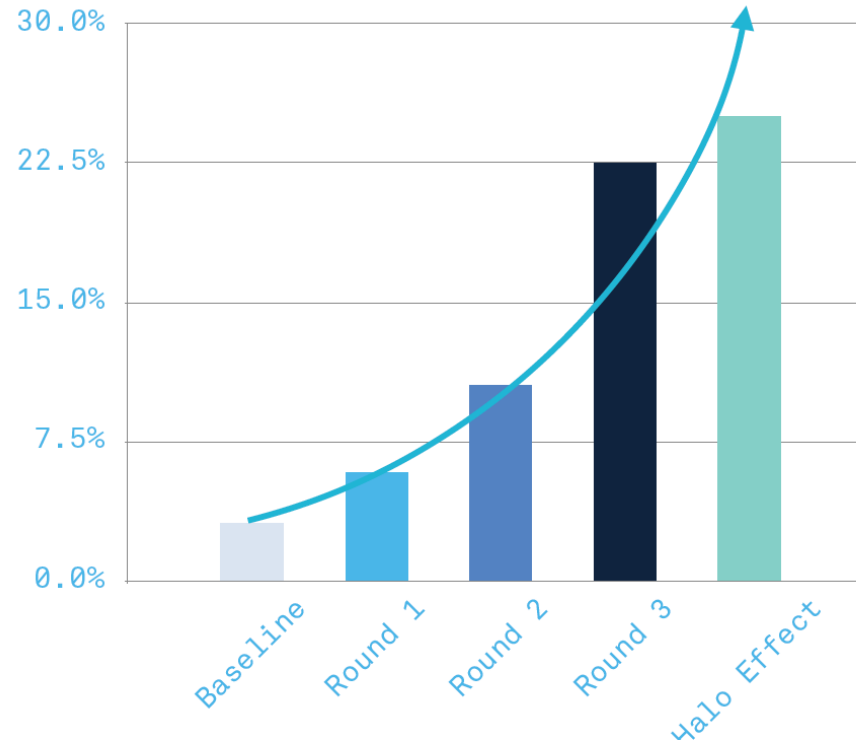


Urbint

8x improvement in identification of atmospheric corrosion on customer-sited gas pipes at two large IOUs

RESULTS

- Urban data + AI provided 8x lift on identification of at-risk gas assets
- Urbint's linked data and algorithms provided 90% the feature value



KEY FINDINGS

- Significant features include: pipe history, pollution, weather
- Assets can progress from NO corrosion to SEVERE corrosion in **under 2 years**

Undisclosed
Customers

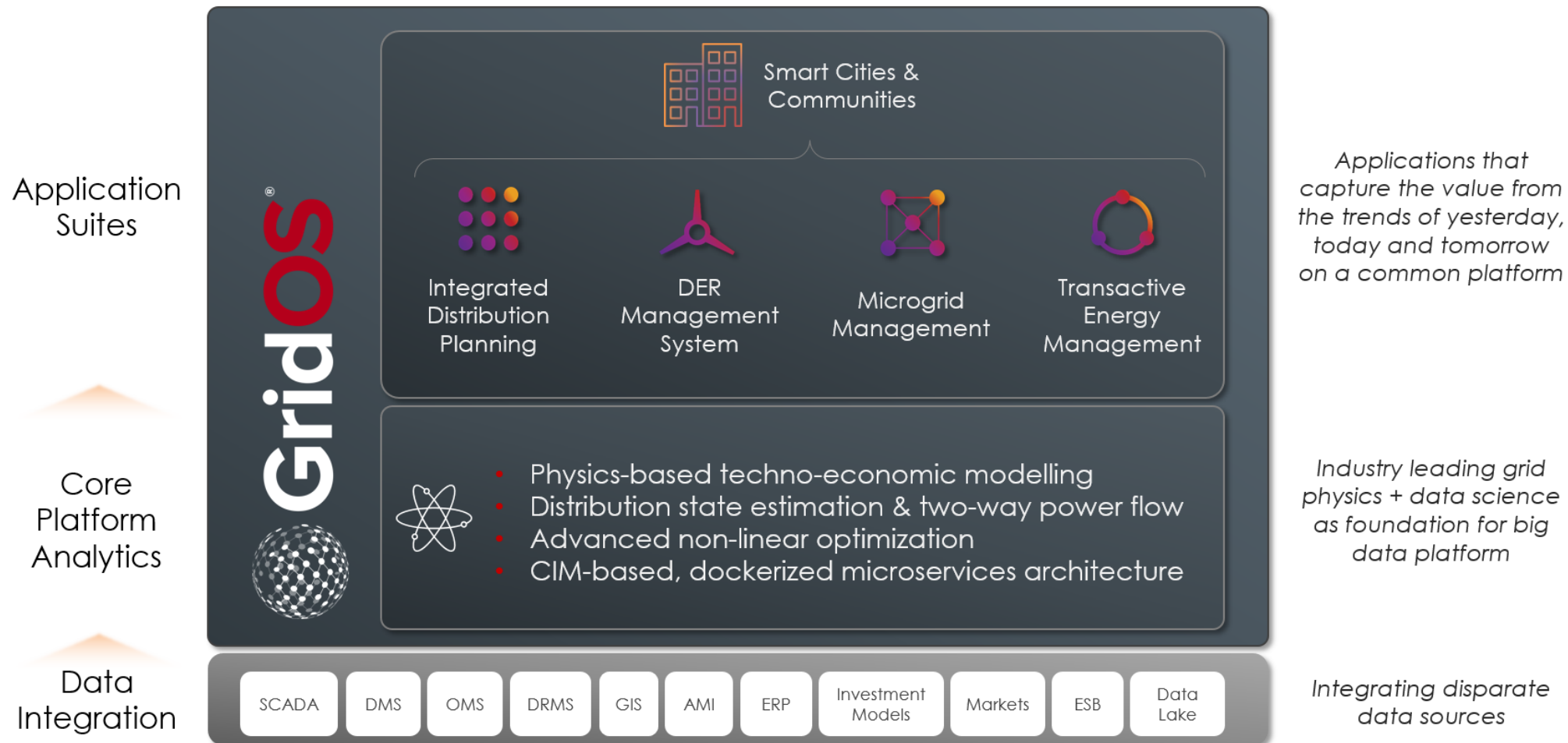


Top 15 West-Coast Utility



Top 15 Northeastern Utility

advanced distribution system modeling for planning and DER optimization

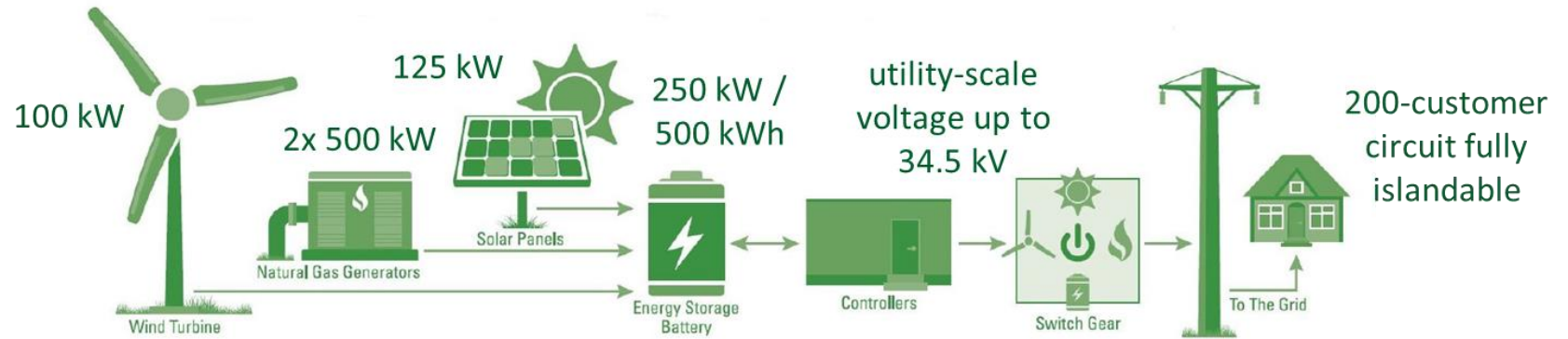


testing operational and business models for the distributed grid at Ameren



**1.2 MW microgrid
Champaign, IL**

Testbed for DER and
renewables monitoring
and control methods

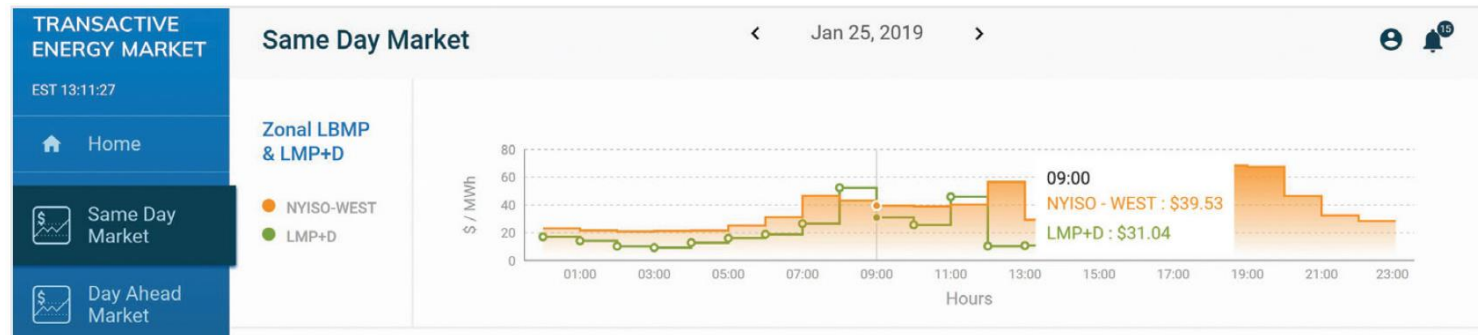


MISO LMP • T&D Losses • Load Forecasts • Feeder Constraints • DER Bids



**GridOS® Transactive Energy
Management Platform**

15-minute location-based
prices at every node on the
circuit to coordinate DER
and load dispatch



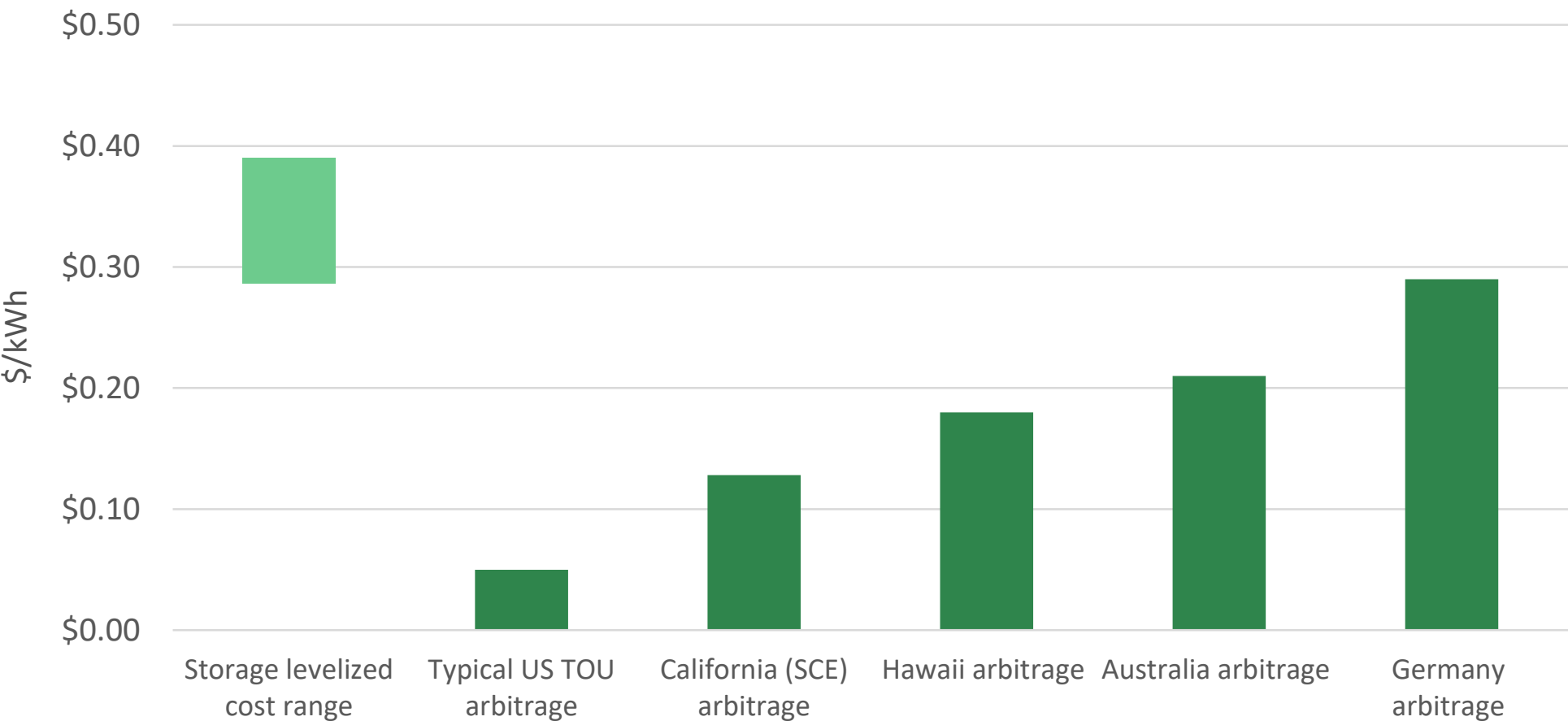
→ Evaluating settlement via blockchain or centralized ledger

Distributed energy resources

disruptive trend: **increasing consumer demand for storage and resiliency**

residential customers are starting to buy storage, despite weak economics

Residential Storage Levelized Cost Versus Arbitrage value



Q1 2018:
Sunrun reported
>25% storage
'attach rate' on
new California
household solar
sales

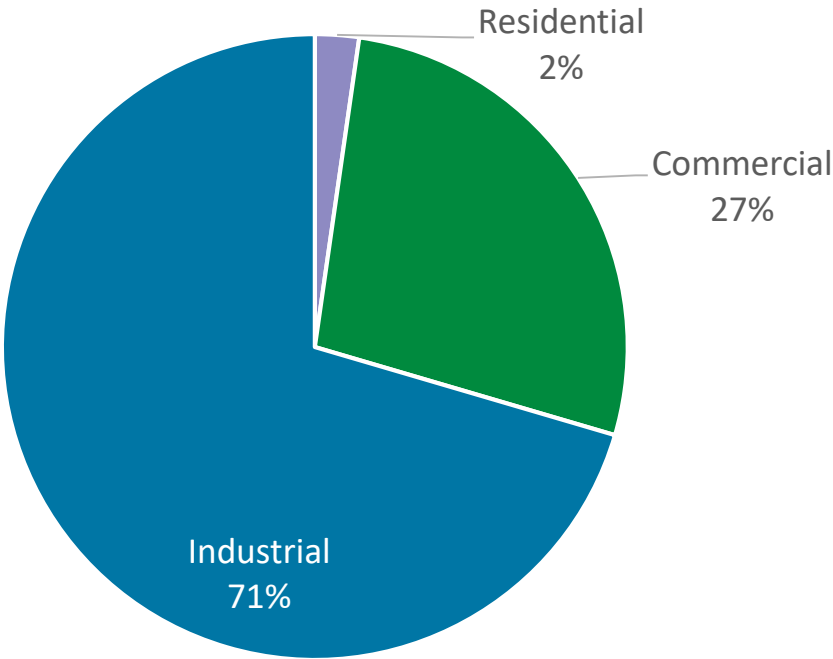
Note: Storage cost assumes no subsidies (such as the California SGIP or solar ITC). Assumes storage system installed cost of \$550-750/kWh and a 10 year lifetime, with one cycle per day, 90% of the year. Germany FIT prices are based on tenders. Australia retail rates and FIT prices represent New South Wales. Hawaii FIT is assumed to be the "smart export" bill credit for excess generation.

the opportunity: **offering resiliency services strengthens customer relationships**

who suffers most from power outages? C&I consumers without backup generators

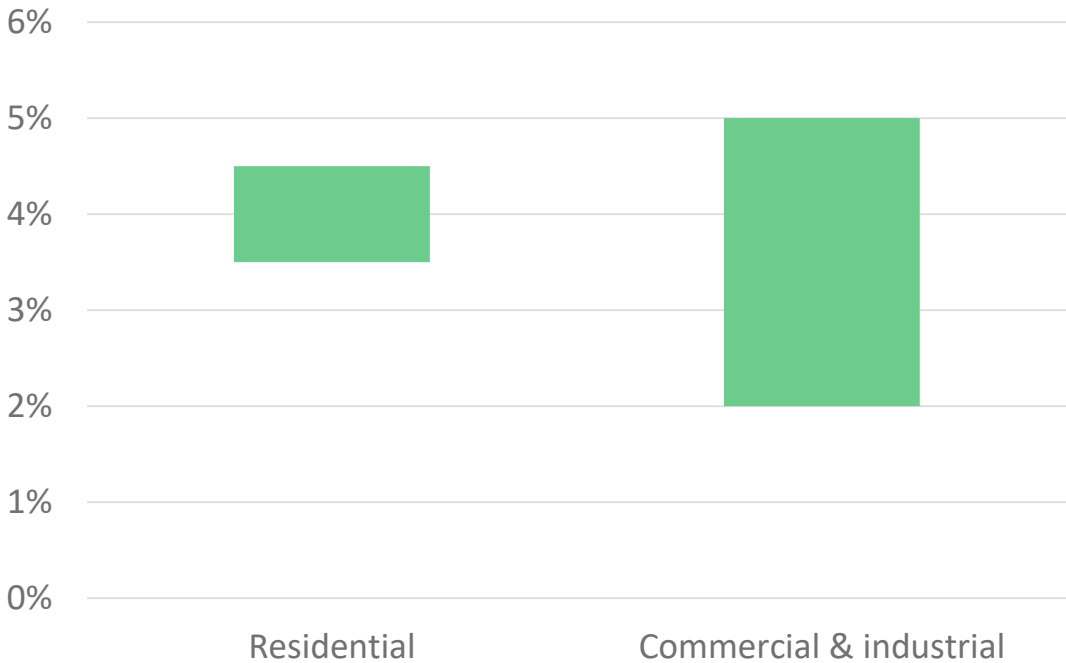
\$44 billion dollars of value per year on the table

Cost of sustained US power outages (LBL)*



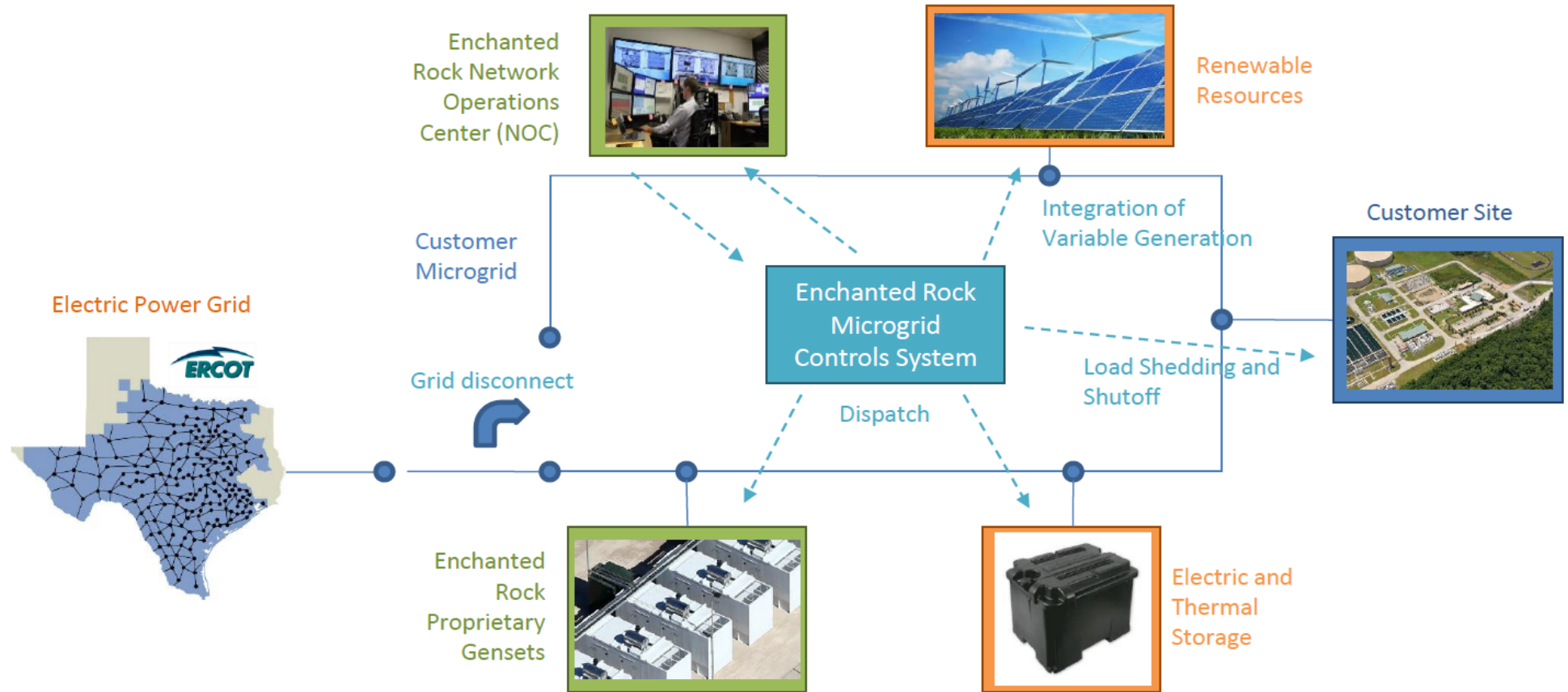
Source: Lawrence Berkeley Lab, “Improving the Estimated Cost of Sustained Power Interruptions to Electricity Customers”, 2018
Note: *”Sustained” power outages last for more than a few seconds.

Market penetration of backup generators (est.)



Source: EIP estimates based on Generac investor documents.

grid-service enabled reliability microgrids



Clean, quiet, compact
natural gas gensets

Grid services buy down the end
customer's cost of reliability

Fully islandable for
backup power

powering the community through Hurricane Harvey



18 HEB stores open during Harvey

3 Buc-ee's stores open during Harvey



105 Hours run during storm



"Buc-ee's was honored to host the first responders and national guardsmen at our Katy store during the recent disaster caused by hurricane Harvey. We were confident that our ERock generators would keep the lights on."

- Jeff Nadalo, Buc-ee's General Counsel

Select Other
Customers

TEXAS A&M
UNIVERSITY

PEPPERL+FUCHS

GCWA
Gulf Coast Water Authority



City of
Houston

300+ MW distributed generation deployed

equipping a southeastern utility to **meet customer demands with “resiliency-as-a-service” offering**



**Southeastern
UtilityCo**



Contribution	Benefit
Designs, builds, and operates BTM natural gas resiliency microgrids	
Owens microgrids and maintains customer relationships	Customer subsidized quick-response generation for local grid reliability, energy, and ancillary services
Pays half the price of a diesel backup solution	99.9999% reliability

UtilityCo is working with state PUC to rate base future reliability projects

SaaS platform leveraging deep learning to enable **optimized operation and trading of complex energy assets in wholesale energy markets**

DER / VPP Platform



Load



Battery

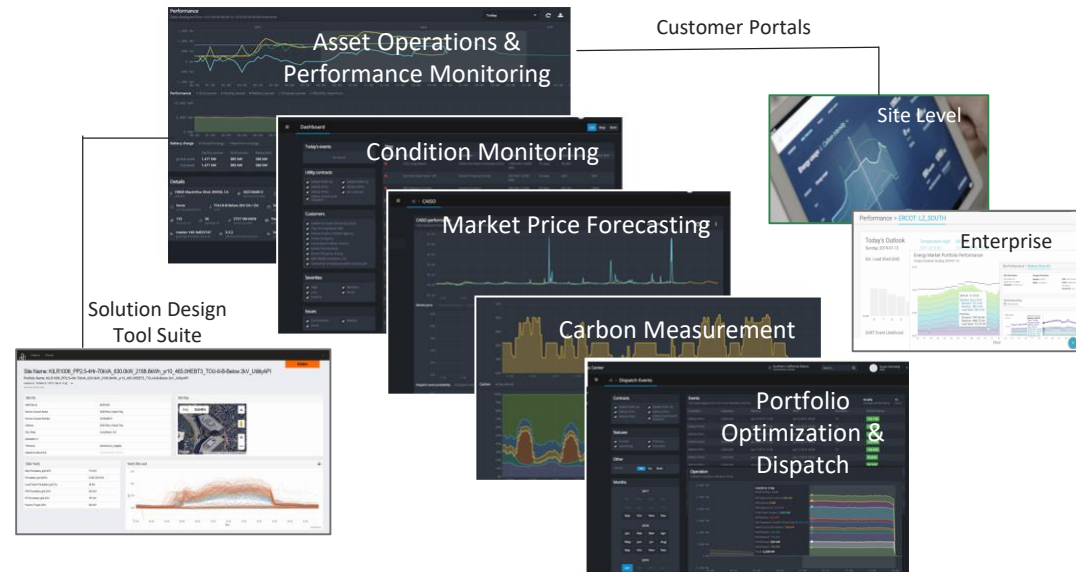


Solar



EV Charging

Customer Portals



Market Trading Platform



Battery



Solar



Wind



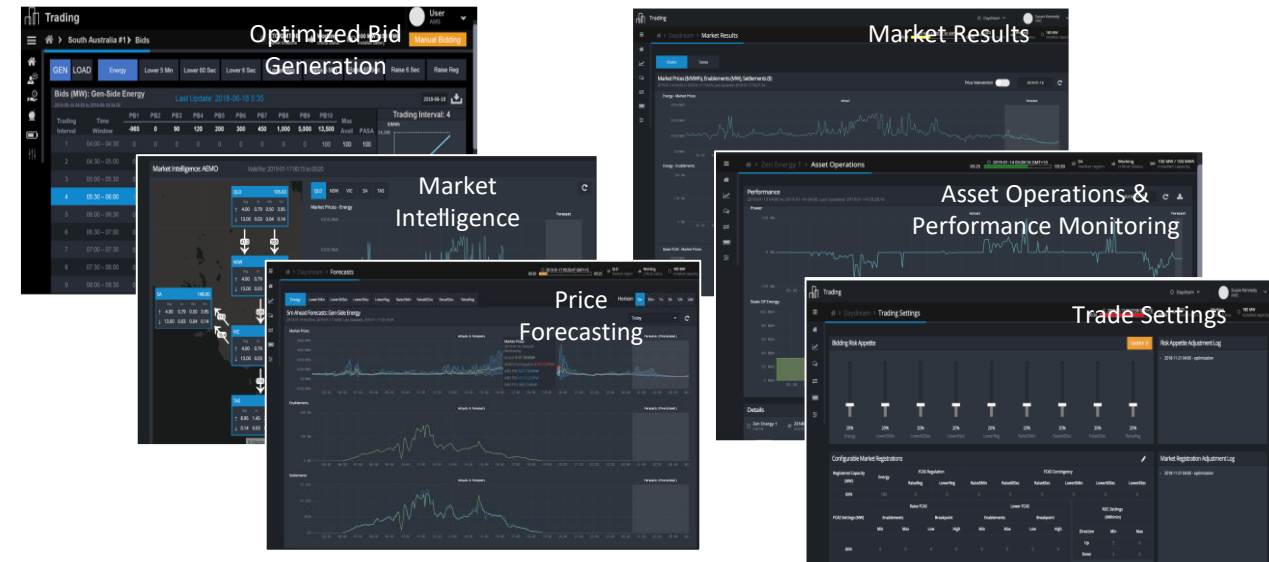
VPP



Gas



Hydro



managing 50 MW/200 MWh storage capacity for SCE

AMS selected by Southern California Edison through its LCR procurement to **deploy 50 MW/200 MWh of behind-the-meter batteries across ~100 sites in Southern California.**



AMS' software platform will **control the battery deployments in concert** to respond to capacity calls from the utility – acting as a virtual power plant

When not offering capacity to the grid, the batteries will provide demand charge reduction/peak shaving for site hosts

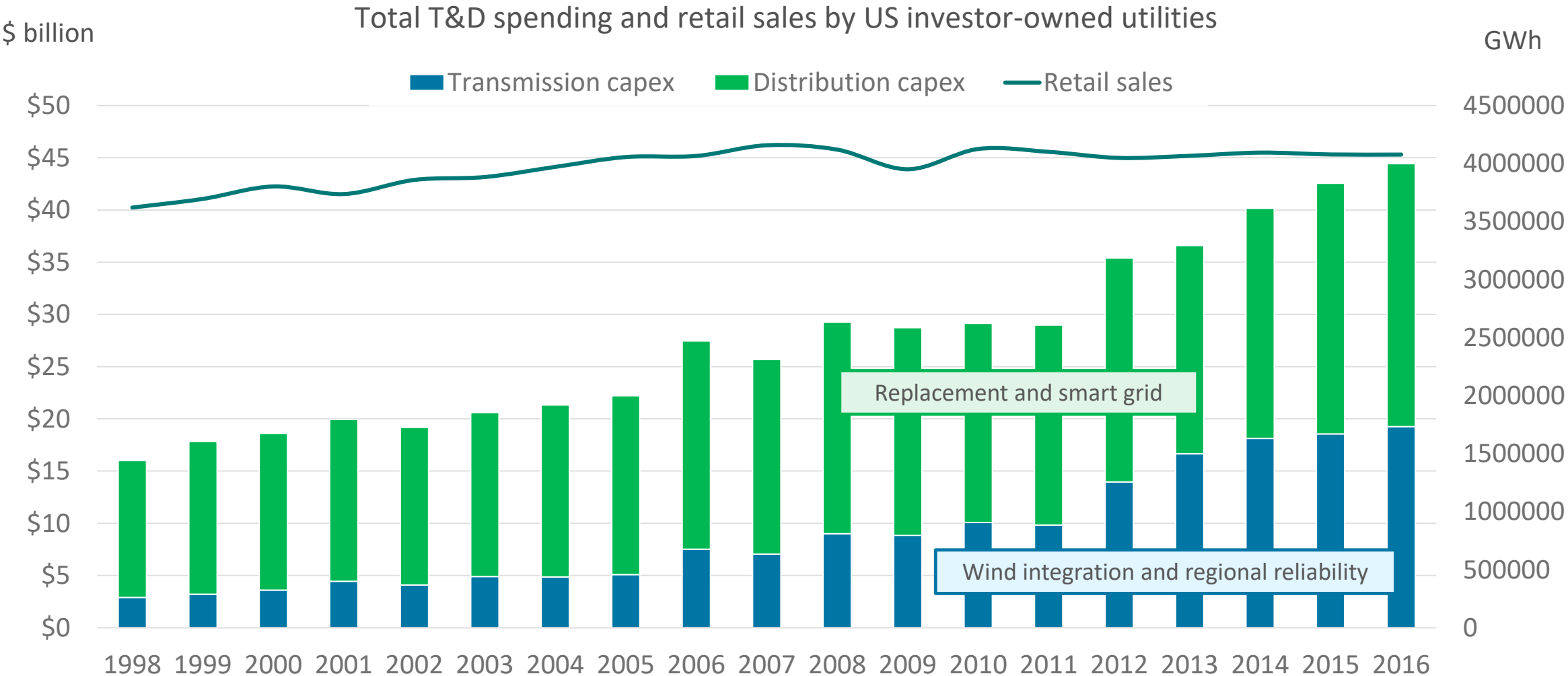
Select Other
Customers & Partners



Mobility & electrification

disruptive trend: **growing T&D capex and flat sales**

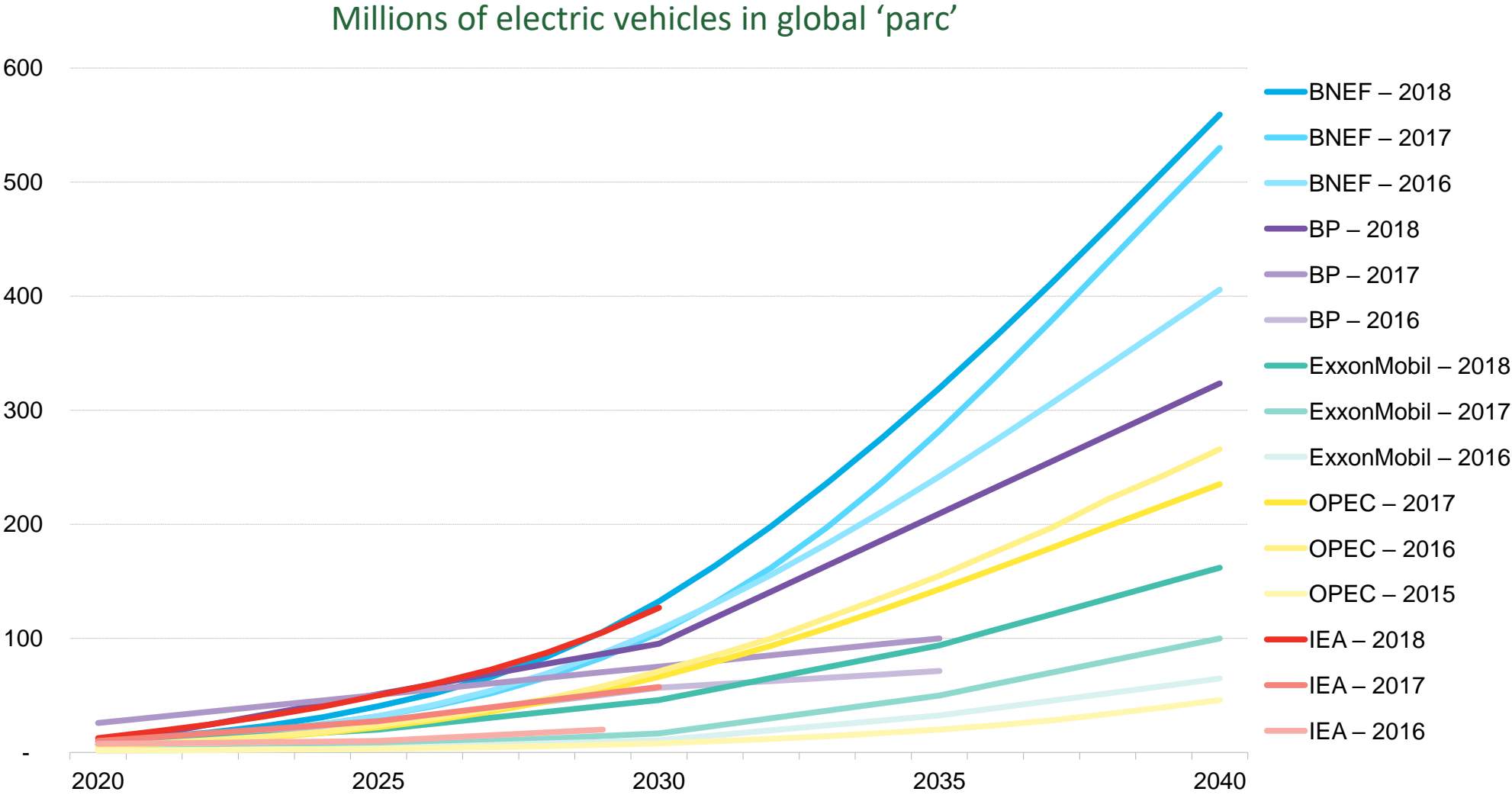
a recipe for rate pressure



Source: Bloomberg New Energy Finance, EIA

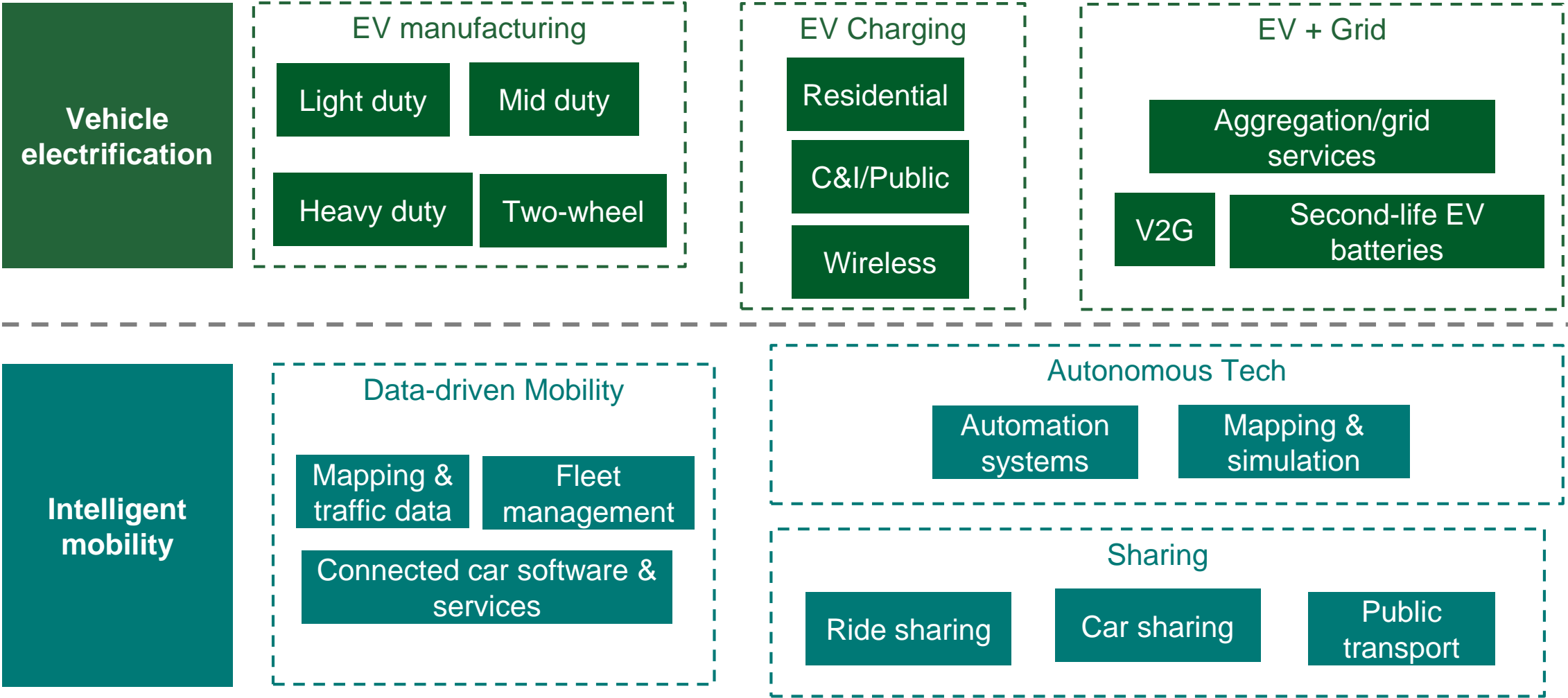
the opportunity: **vehicle electrification**

long-term EV outlook continues to strengthen



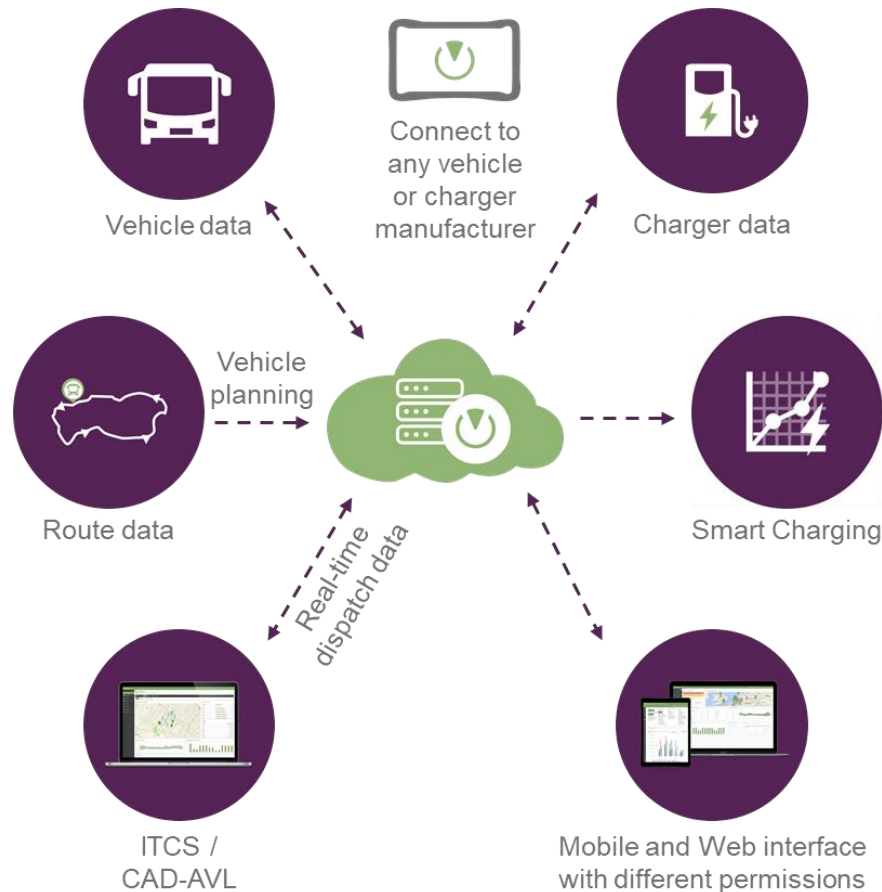
the full scope of the mobility transformation, from the utility perspective

transportation evolving beyond the fuel source





cloud-based platform for real-time electric vehicle fleet monitoring & telematics



Optimize bus operations

- Eliminate range anxiety
- Full utilization of battery capacity
- Cost/mile reduction



In-depth reporting

- Vehicle and Charger KPI reports
- Driver performance reporting
- Automated management reporting
- Customizable reports



Smart Charging

- Utility cost reduction
- Increase charging flexibility and efficiency
- Battery life extension



Real-time diagnostics

- Immediate fault & warning messaging
- Detailed online multi-parameter analyses
- Battery health analysis





70% of all electric buses operating in Europe run on Viriciti

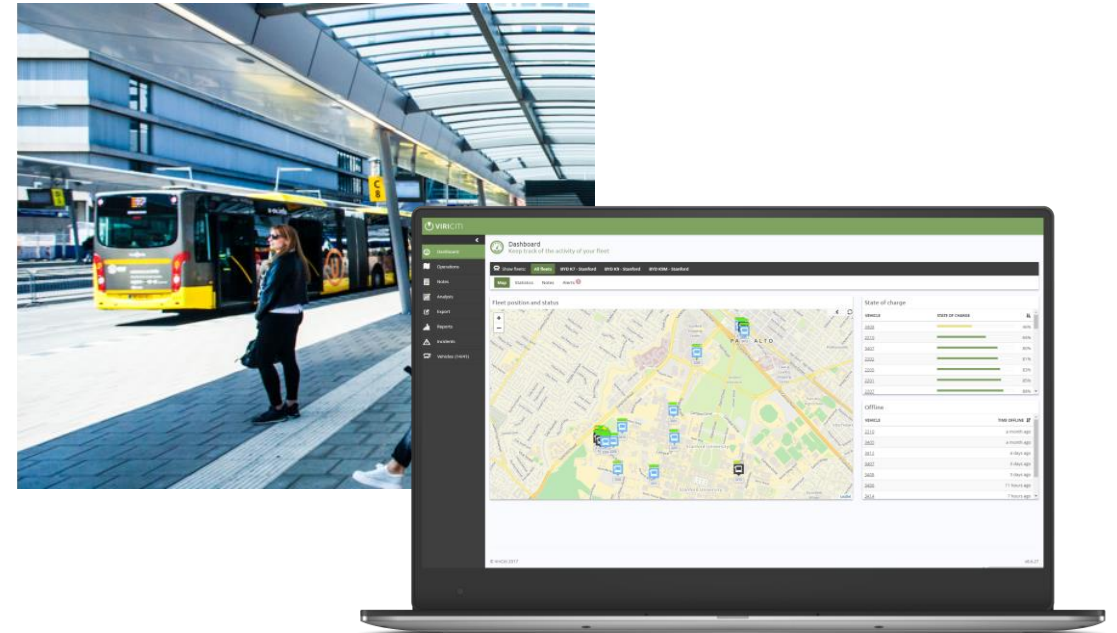
Qbuzz

operates a fleet of 800 buses in the Netherlands



increased usable range of Qbuzz's first electric buses from 40% to 85% within 4 weeks

enabled Qbuzz to monitor individual driver patterns to optimize operation of their assets



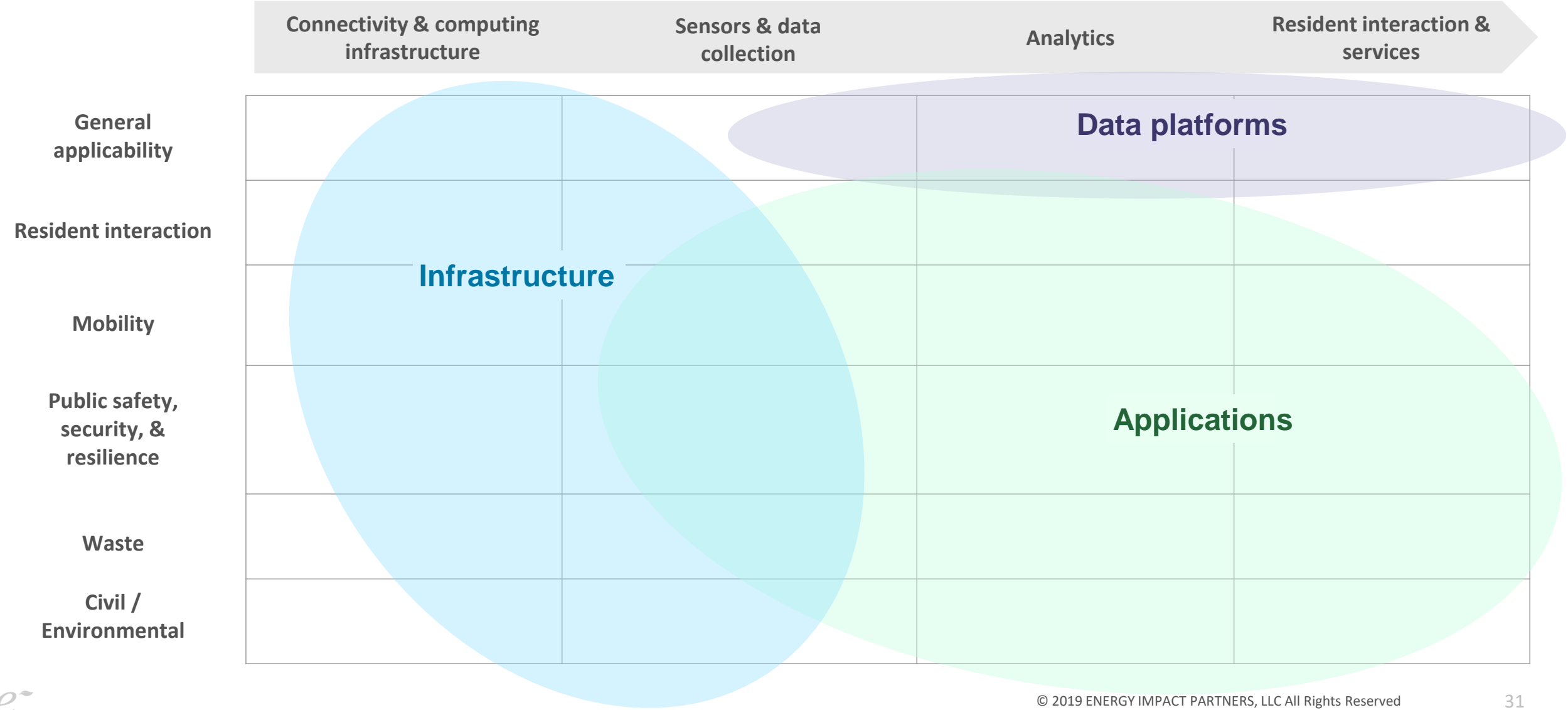
Select
customers



Smart cities & buildings

disruptive trend: **booming ‘connected communities’ solutions**

but where is the play for utilities? probably on the infrastructure end of the value chain...



smart city and streetlighting platform

Managed Services

Cloud Software & Consumer Apps

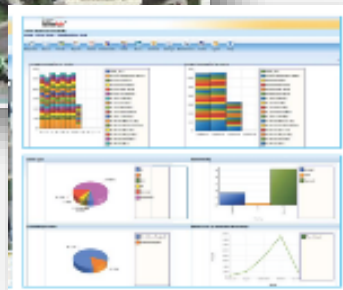
Controllers & Sensor Hubs



NOC Support



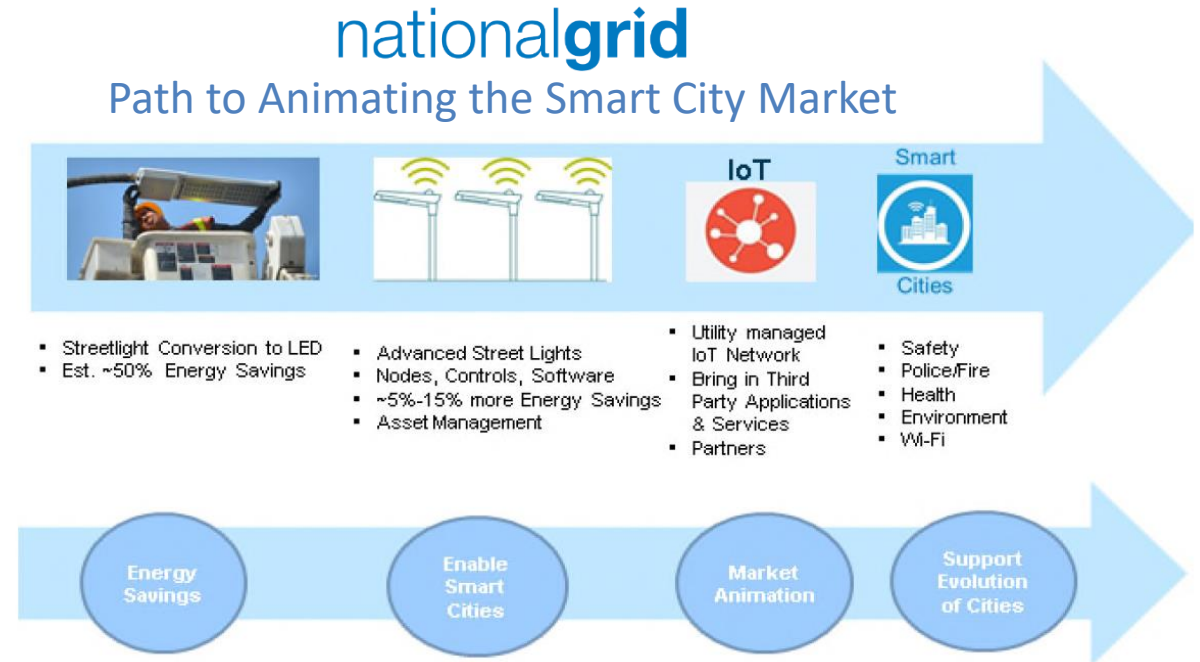
Onsite Support



realizing new smart city revenues at National Grid

CIMCON's Near Sky platform is providing key hardware and software functionality to **turn National Grid's streetlights into a smart city platform.**

Through its REV demonstration project, National Grid will test **multiple models of asset ownership and new revenue generation through smart city product offerings** for their municipal customers.



Select Other
Customers & Partners



Pacific Gas and
Electric Company



Cybersecurity

disruptive trend: **growing cyber risk**

utilities increasingly at the center of escalating cyber conflict among nation states



June 2019

Utilities are 'the new cyber battlefield,' as US ramps up pressure on Russia's electric grid

**MIT
Technology
Review**

December 2016

**“Ukraine’s Power Grid Gets Hacked Again,
a Worrying Sign for Infrastructure Attacks”**



September 2019

First remote cyberattack on US grid found, regulator says



the opportunity: **better monitoring across both physical and cyber assets**

the Dragos OT visibility and threat detection platform, force-multiplied via a unique public/private partnership

DRAGOS

Neighborhood Keeper

Dragos has **partnered with DOE and NERC** to develop a first-of-its-kind collaborative threat detection and shared intelligence program.

Neighborhood Keeper **enables threat insights from ICS and OT networks to be shared in near-real-time** with participant privacy maintained and zero trust required.



Questions?

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