How cognitive, connected technologies are changing the world of Energy and Utilities

Liang Downey

Energy, Environment & Utilities

Global Industry IoT Leader

ldowney@us.ibm.com

Advanced Energy Stakeholders Breakfast

Chicago | September 27 2017

IBM

Cognitive systems are different

UNDERSTAND

Cognitive systems understand imagery, language and other unstructured data like humans do.

REASON

They can reason, grasp underlying concepts, form hypotheses, and infer and extract ideas.

LEARN

With each data point, interaction and outcome, they develop and sharpen expertise, so they never stop learning.
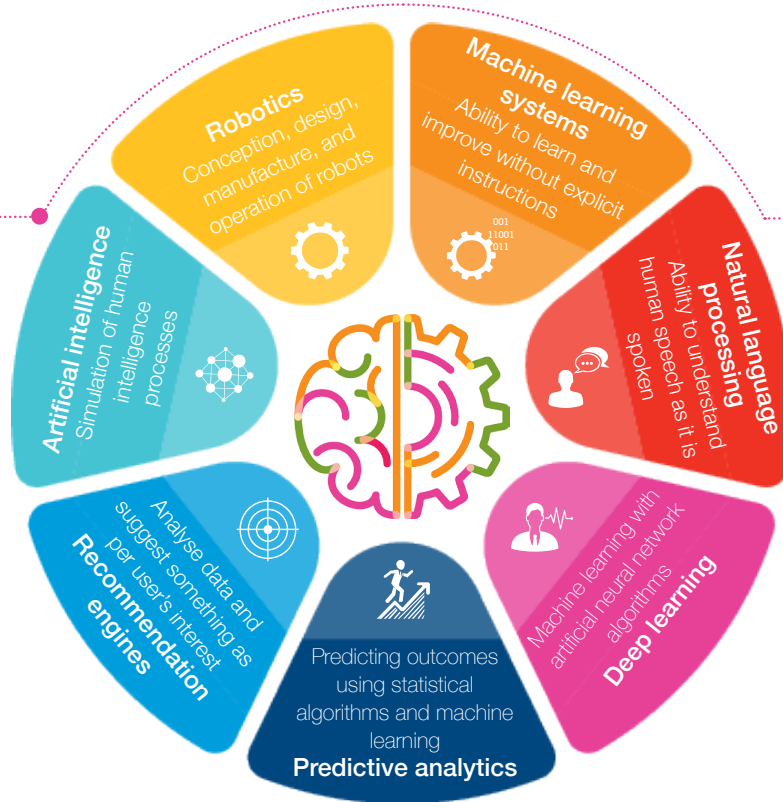
INTERACT

With abilities to see, talk and hear, cognitive systems interact with humans in a natural way.

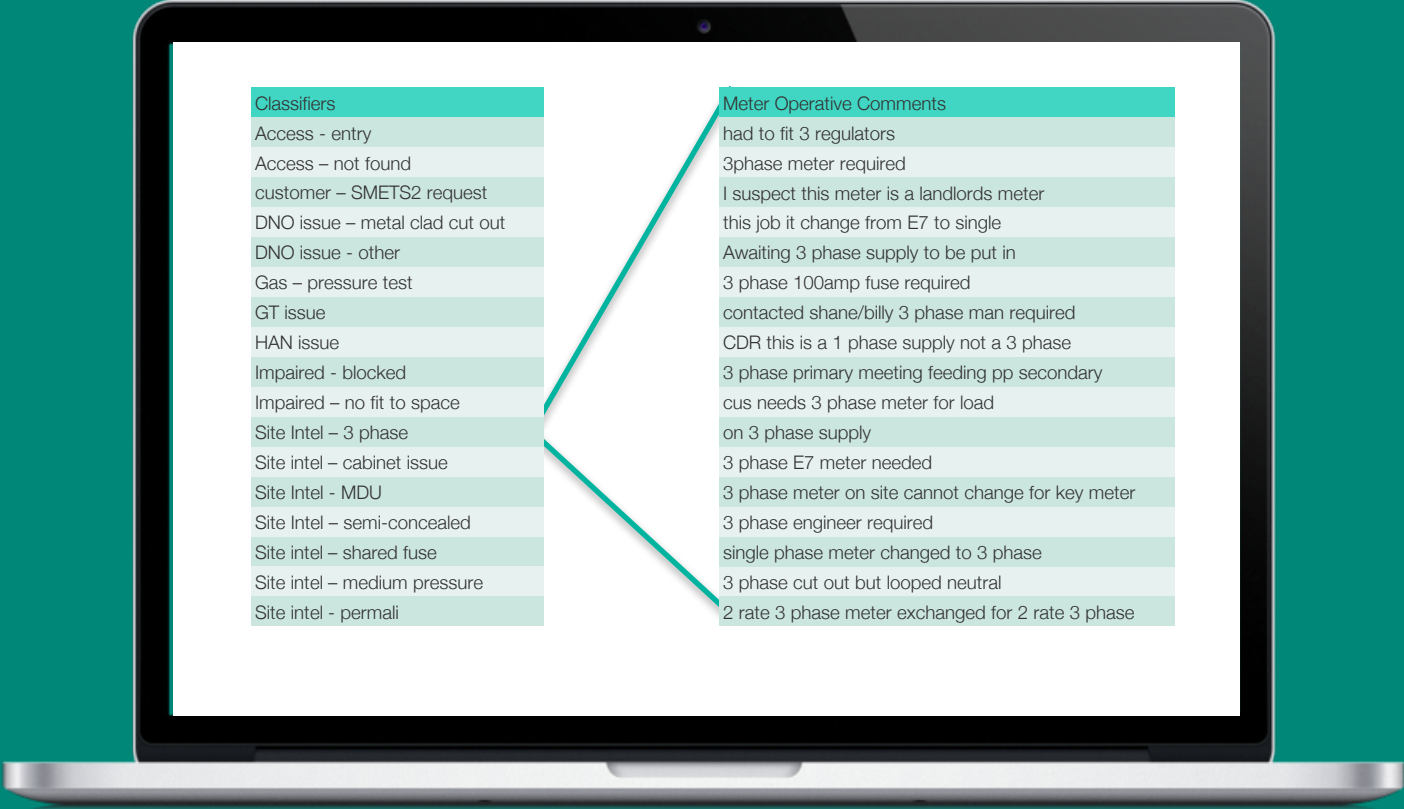# **Cognitive** is under-pinned by a number of advanced technologies and has the **power** to **transform business**

Cognitive Technologies

Robotics
Conception, design, manufacture, and operation of robots

Machine learning systems
Ability to learn and improve without explicit instructions

Artificial intelligence
Simulation of human intelligence processes

Natural language processing
Ability to understand human speech as it is spoken

Recommendation engines
Analyse data and suggest something as per user's interest

Predictive analytics
Predicting outcomes using statistical algorithms and machine learning

Deep learning
Machine learning with artificial neural network algorithms

Business Value

- Create new ways of interacting with customers

- Reveal more powerful on-demand business insights through real-time access to data
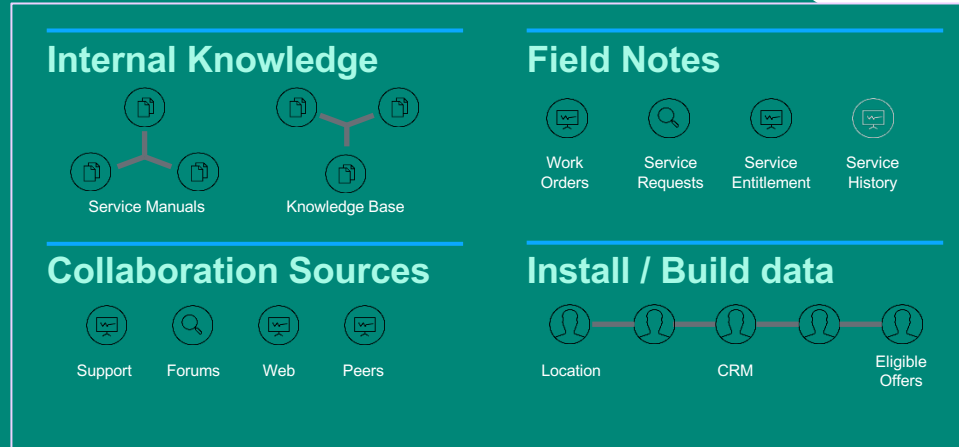
- Enable business model – and ecosystem – transformation

IBM

Cognitive efficiency – smart meter installation

Classifiers
Access - entry
Access – not found
customer – SMETS2 request
DNO issue – metal clad cut out
DNO issue - other
Gas – pressure test
GT issue
HAN issue
Impaired - blocked
Impaired – no fit to space
Site Intel – 3 phase
Site intel – cabinet issue
Site Intel - MDU
Site Intel – semi-concealed
Site intel – shared fuse
Site intel – medium pressure
Site intel - permali

Meter Operative Comments
had to fit 3 regulators
3phase meter required
I suspect this meter is a landlords meter
this job it change from E7 to single
Awaiting 3 phase supply to be put in
3 phase 100amp fuse required
contacted shane/billy 3 phase man required
CDR this is a 1 phase supply not a 3 phase
3 phase primary meeting feeding pp secondary
cus needs 3 phase meter for load
on 3 phase supply
3 phase E7 meter needed
3 phase meter on site cannot change for key meter
3 phase engineer required
single phase meter changed to 3 phase
3 phase cut out but looped neutral
2 rate 3 phase meter exchanged for 2 rate 3 phase

Cognitive transformation – asset know-how

- Advanced asset management
- Knowledge management
- Maintenance and consumption
- Virtual agent and agent assist
- Predictive health and risk

Planned Field Technical Advisor

Internal Knowledge

Service Manuals

Knowledge Base

Field Notes

Work Orders

Service Requests

Service Entitlement

Service History

Collaboration Sources

Support

Forums

Web

Peers

Install / Build data

Location

CRM

Eligible Offers

1	2	3
Aggregated Data Views	**Cognitive Learning**	**Point of Impact Insights**

IBM

The rise of the **cognitive** IoT

- Actively learns from things, context, and interactions
- Continuously adapts to be more useful and robust
- Relates insights in easily understandable ways

30 billion
connected things

40%
of all data

IBM

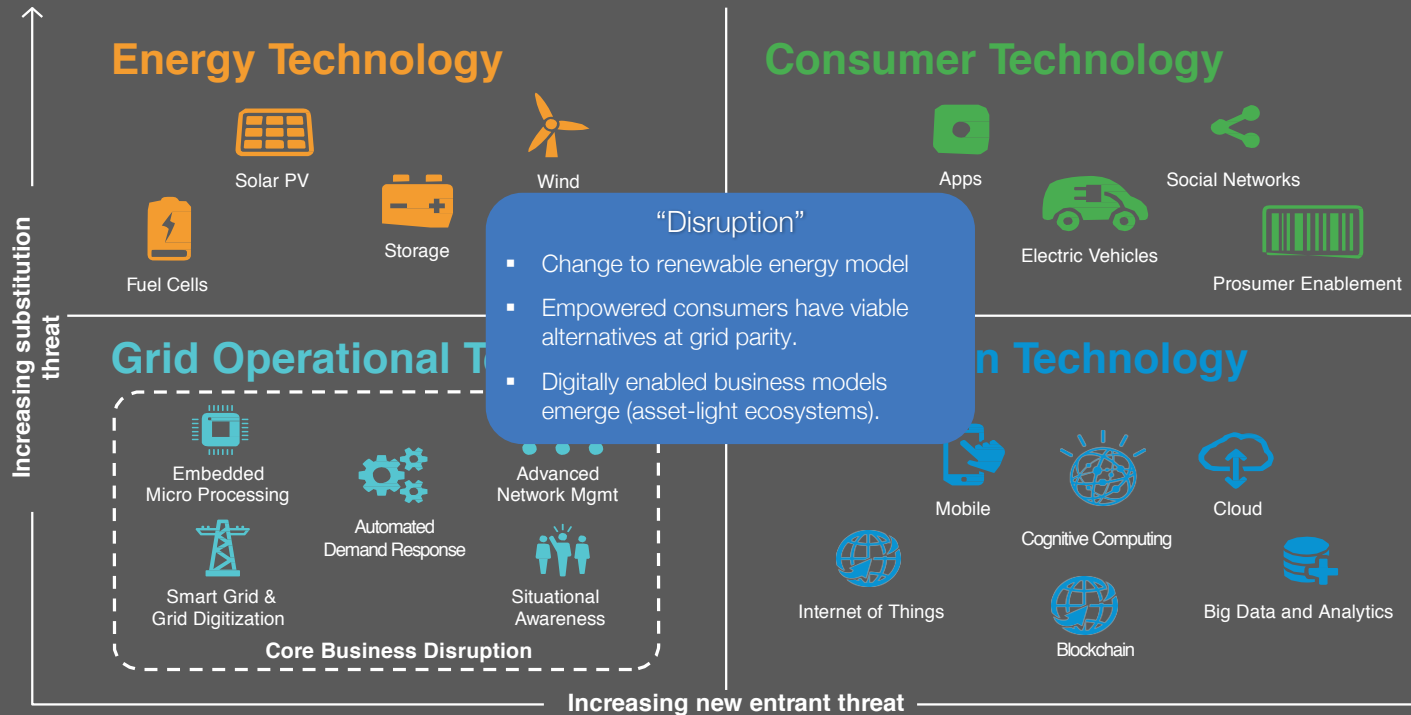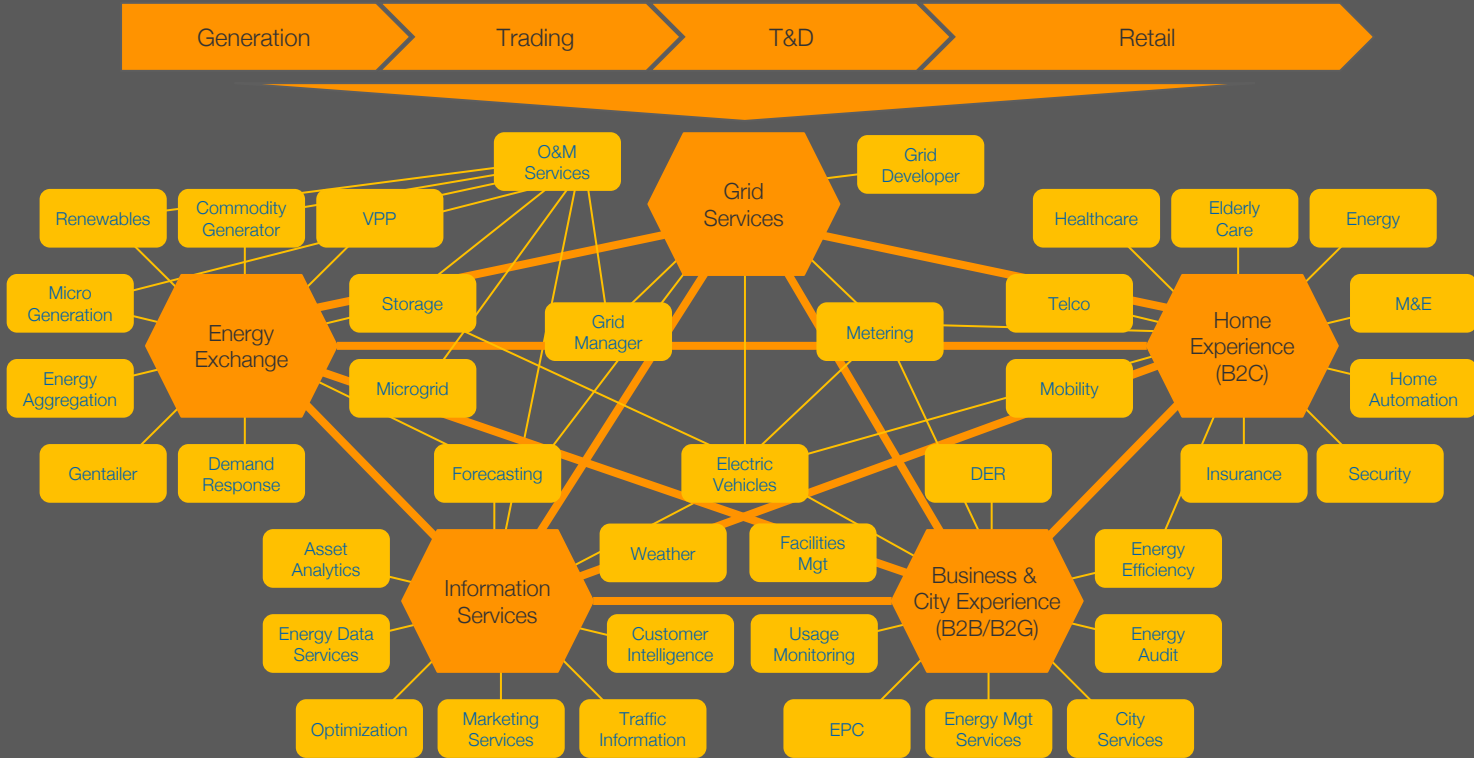**Cognitive and Connected** new business models

KONE
Dedicated to People Flow

" Embedded intelligence from the Internet of Things will help KONE move one billion people around buildings every day more efficiently, safely, and effectively. "

Larry Wash
Executive VP, KONE Americas

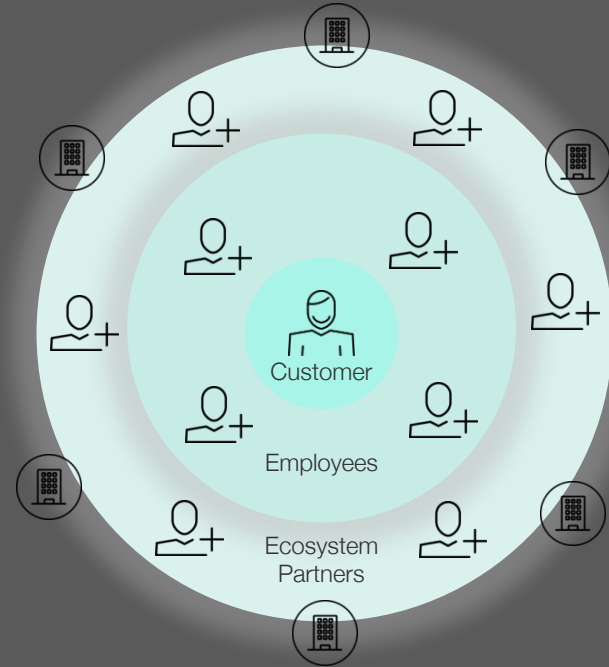# Utility businesses are disrupted by four types of technology innovation

Energy Technology

Solar PV

Wind

Storage

Fuel Cells

Consumer Technology

Apps

Social Networks

Electric Vehicles

Prosumer Enablement

Grid Operational T ... **n Technology**

Embedded Micro Processing

Automated Demand Response

Advanced Network Mgmt

Smart Grid & Grid Digitization

Situational Awareness

Core Business Disruption

Mobile

Cognitive Computing

Cloud

Internet of Things

Blockchain

Big Data and Analytics

"Disruption"
- Change to renewable energy model
- Empowered consumers have viable alternatives at grid parity.
- Digitally enabled business models emerge (asset-light ecosystems).

Increasing substitution threat

Increasing new entrant threat

IBM

A future Utilities industry model of platform ecosystems

Generation → Trading → T&D → Retail

O&M Services
Grid Developer
Grid Services

Renewables
Commodity Generator
VPP

Healthcare
Elderly Care
Energy

Micro Generation
Storage
Grid Manager
Metering
Telco
M&E

Energy Exchange
Home Experience (B2C)

Energy Aggregation
Microgrid
Mobility
Home Automation

Gentailer
Demand Response
Forecasting
Electric Vehicles
DER
Insurance
Security

Asset Analytics
Weather
Facilities Mgt
Business & City Experience (B2B/B2G)
Energy Efficiency

Information Services

Energy Data Services
Customer Intelligence
Usage Monitoring
Energy Audit

Optimization
Marketing Services
Traffic Information
EPC
Energy Mgt Services
City Services

Digital Reinvention™
There are seven drivers of digital reinvention with experience at the core

© 2017 IBM Corporation
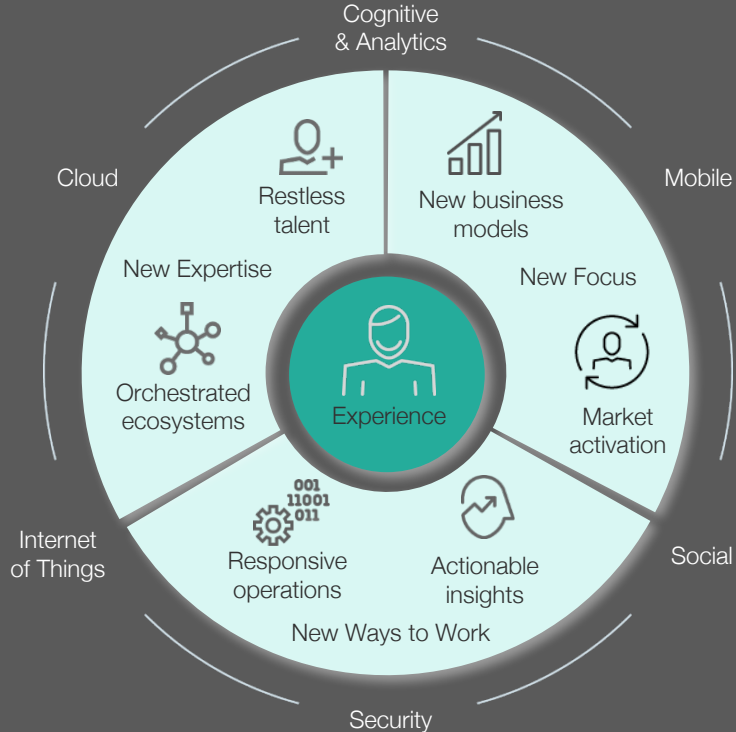
A digital reinvention journey

Sonnen

Tesla

Sonnen

Tennet

IBM Cognitive

IBM Blockchain

© 2017 IBM Corporation

IBM
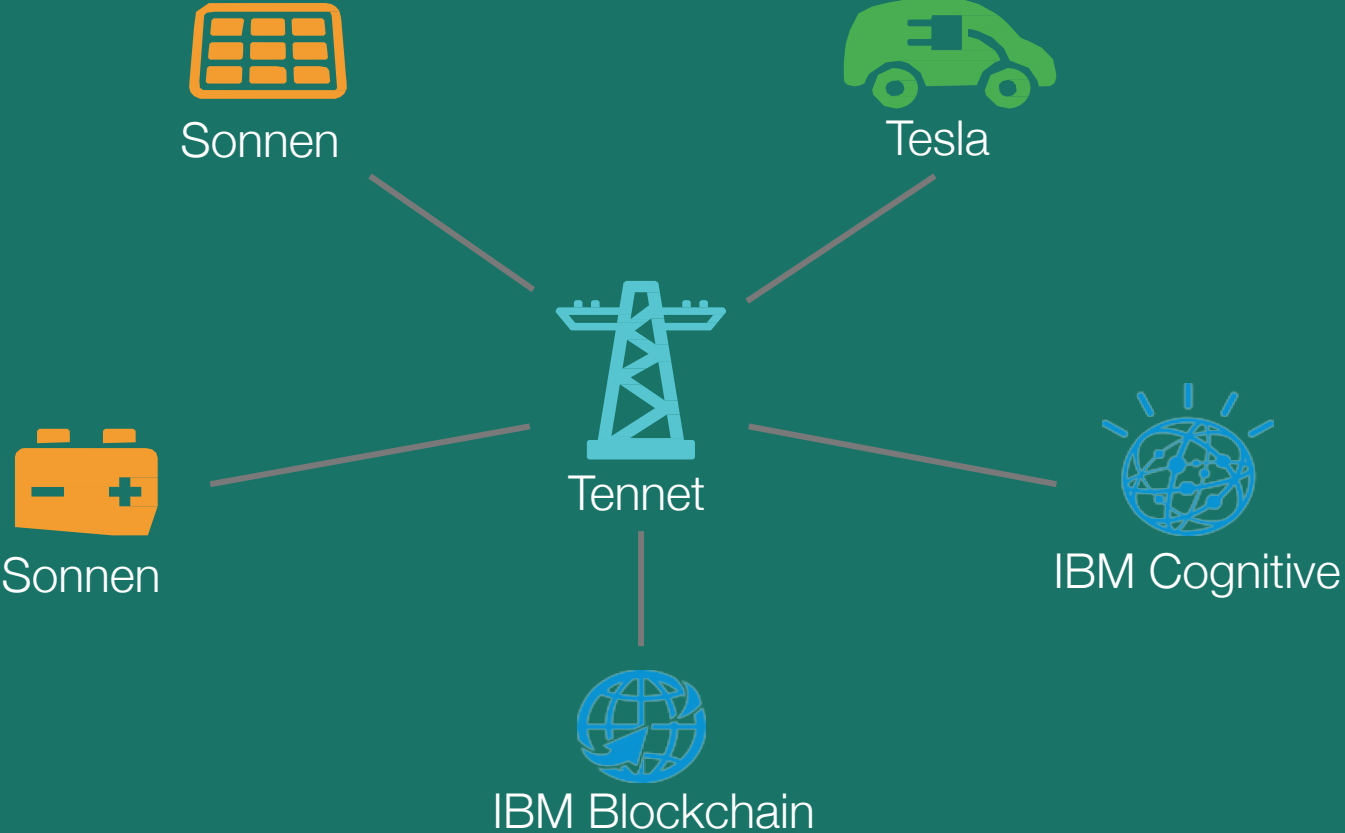
Cognitive and connected utilities: *a new era?*

IBM