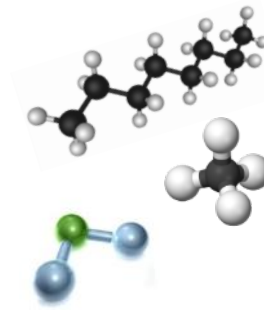


Slow Pace of Fast Change

The Future of Energy Systems



Designed for



Designed by

Garry Golden

Forward Elements Inc

Start

End



Warm up
Foresight 101

Drivers of Change
IoT Consumerization
Data-driven Workplace
Distributed Resources
Blockchain + Smart Contracts

Next Steps

The *Slow Pace* of Fast Change



20th Century Dynamics

Alternative Futures

Baseline Future

Distributed

?

?

Networks

?

Design for
Behavior Change

Maintenance,
Preservation
& Renewal

21st Century Dynamics

**Last
ten years**



**Next
ten years**



More or Less Change Ahead?

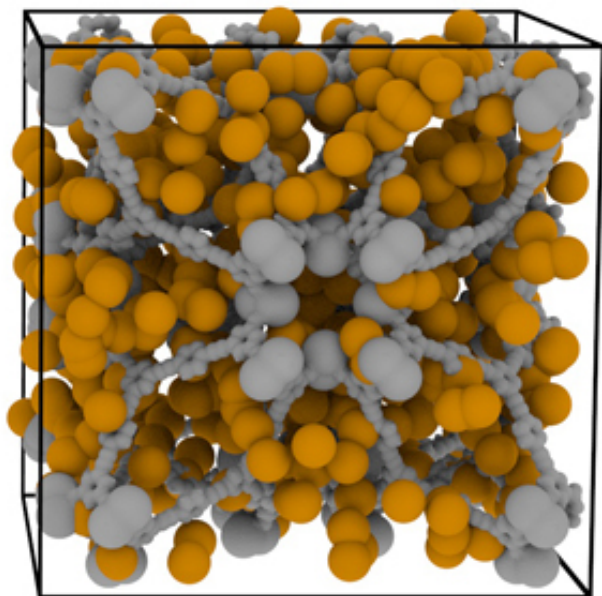




In the News

High Surface Area Crystal Sponges + Natgas

MOFs – Metal Organic Frameworks



Northwestern
Image by Christopher Wilmer/NuMat Technologies)



Science Journal



In 2017 Tokyo Gas will begin selling solid natural gas (MOFs) in 7-11 stores as fuel for portable micro fuel cells that recharge devices.



True

False

KICKSTARTER

11,660 backers pledged \$1,529,561 to help bring this project to life.



kraftwerk

the first fuel cell power generator
operated on standard gas
3 seconds to refuel



say Goodbye to the grid
much lighter than batteries
never ever run out of power again

**Could fuel-based micro-power systems
be at same developmental stage as cell phones in late 1980s?**



**\$49 (12 cartridges)
11 phone charges per cartridge**

Scenario: World of low cost fuel-based electronic devices

A disruptive idea of fuel-based micro-power?



Apple granted portable fuel cell power system patent

Apple has been granted a patent for an external portable fuel cell electricity generation unit designed to power portable computing devices.



By [Leon Spencer](#) | March 18, 2015 -- 05:55 GMT (22:55 PDT) | Topic: [Apple](#)

Apple files patent for MacBook fuel cell that could last weeks

APPLE / 04 SEPTEMBER 15 / by JAMES TEMPERTON

One week battery life on an iPhone 6? It's possible

POSTED 1:49 PM, AUGUST 28, 2015, BY [CNN WIRE](#)



**5 Year Plan
Fuel-based Devices**



**Unplug
Refuel**



**Fuel-cell
on a Chip**



**The Cordless
Christmas**



**House Construction
without
Electrical Sockets**



#1 Fuel Distributor

2019

2021

2024

2026



Example of Tapping Your Inner Futurist

What fuel-based innovations might capture head, heart & wallets of our communities?

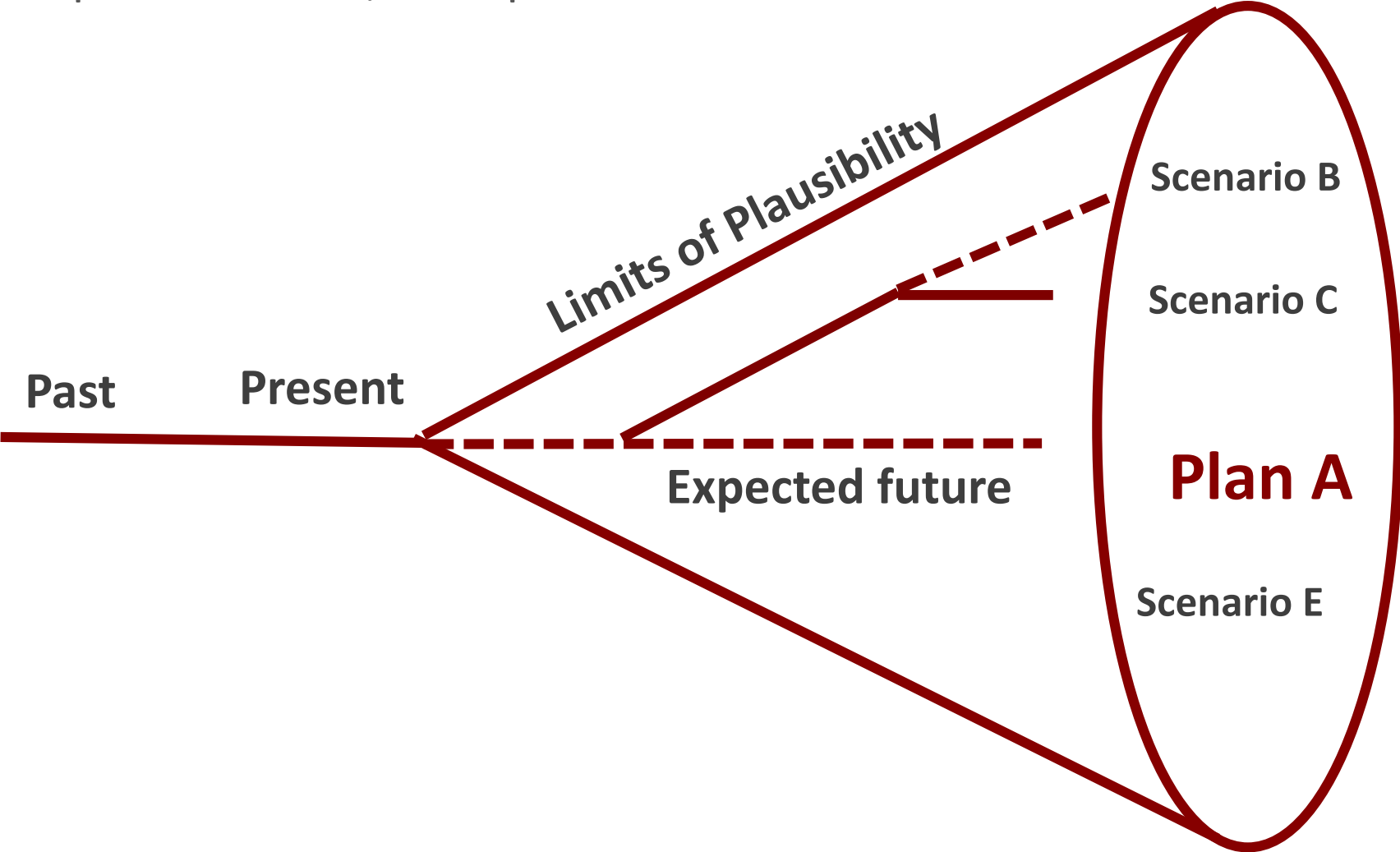
- Could customers *cut the cord* and reduce grid-use?
- Could we get in the business of delivering solid state or liquid fuels?
- Would our members expect traditional CH gases - or embrace hydrogen or renewable synthetic gas?


Tapping My Inner “Futurist”?



Foresight 101: Cone of Plausibility

Multiple Outcomes, Multiple Time Horizons



A close-up photograph of a person's hand holding a small, rectangular white paper strip. The strip is held between the thumb and index finger, and it is slightly curved. The background is a solid, dark black. The text on the strip is printed in a clean, black, sans-serif font. The lighting is soft, highlighting the texture of the skin and the paper.

You will have regulatory
certainty for years to come.

IF YOU HIT THIS SIGN
YOU WILL HIT THAT BRIDGE





WAIT FOR IT

.....Wait for it.....

**Every day I make an effort to move toward
what I do not understand.**

- Cellist, Yo-Yo Ma

Foresight as *Front-End* of Innovation and Growth Strategies



Forecast-based Thinking:

- Confidence in assumptions
- *Stable marketplace/culture*
- *Focus on 'Prediction'*
(*What should happen*)



Scenario-based Thinking:

- Unsure of dominant assumptions
- Markets shaped by uncertainty
- Focus on 'Anticipation' ('could happen')
- Manage uncertainty across a range of plausible outcomes
- Focus on continual monitoring of change

Four Futures Thinking

?



**Continued
Growth**

**Disciplined
- Constrained**



Transformed

BlackBerry.



NOKIA

**Decline
- Collapse**

Describe future conditions of our Four Futures?



**Continued
Growth**



**Disciplined
- Constrained**



Transformed

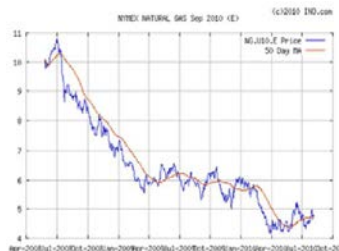


**Decline
- Collapse**



Three Mechanisms of Change

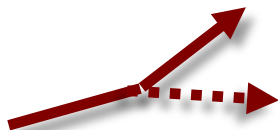
Trends
(Continuities)



Plausible
Future

Forecasts

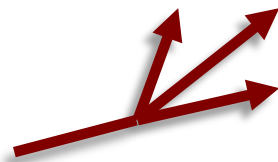
Events
(Discontinuities)



Possible
Futures

Scenarios

Choices
(Discontinuities)



Preferred
Future

Visions

End



Foresight 101



Drivers of Change

- IoT Consumerization
- Data-driven Workplace
- Distributed Resources
- Blockchain + Smart Contracts



Our Next Steps

Disruptive Trends to Watch:

The Slow Pace of Fast Change



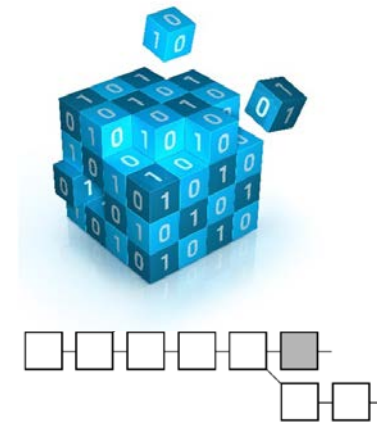
**IoT + Consumerization
of Energy Solutions**



**Data-driven
Workplace**



**Distributed
Resources**



**Blockchain
DApps**

IoT + the Consumerization of Energy Solutions via *Connected Devices*

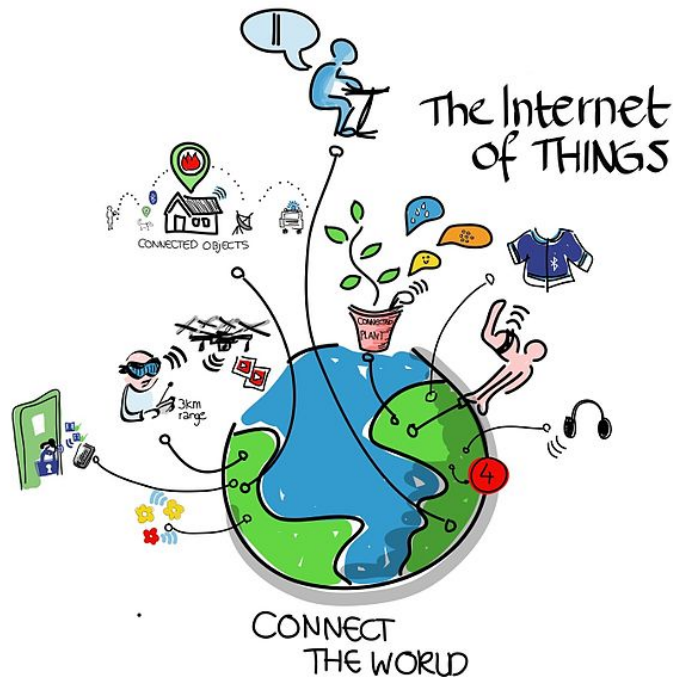


Learning Thermostat

Products that Learn & Lead!

Slow Pace of Fast Change = Healthy Sense of Skepticism

Era of Connected Device driven Energy Solutions



IoT Uncertainties to Explore

- Forecast full impact on energy-gas use
- Regulatory framework / Legislation
- Who creates value? (Benefit over cost)
Who captures it? (Business Model)
- How might we integrate data?
- What new players are capable of pushing utilities off value chain?

Key Elements Driving Consumerization?

Entrepreneurial Spirit for Energy Solutions

KICKSTARTER

SunPort™ – Demand Solar. Anywhere. Instantly.



Join the movement to crowdsource demand for solar energy, just by plugging in.

[Pre-order Here](#)

Created by

Paul Droege



1,676 backers pledged \$120,599 to help bring this project to life.

Key Elements Driving Consumerization?

Lower Barriers to Entry for Innovation + Adoption



Heating-Cooling Management for Individuals Rooms



[SMART VENT](#) [ABOUT](#) [NEWS](#) [FAQ](#)

[PRE-ORDER NOW](#)

PRE-ORDER YOUR SMART VENT SYSTEM BY 7/28/2015 FOR UP TO 25% OFF

MEET YOUR SMART VENT

Now you can heat and cool your home the intelligent and efficient way—room by room.

[PRE-ORDER NOW](#)

Your order could be free!



AS SEEN ON
**SHARK
TANK**

Battery-powered vents to control temperature in individual rooms

Signal: Bigger Players Dipping Toes into the Water

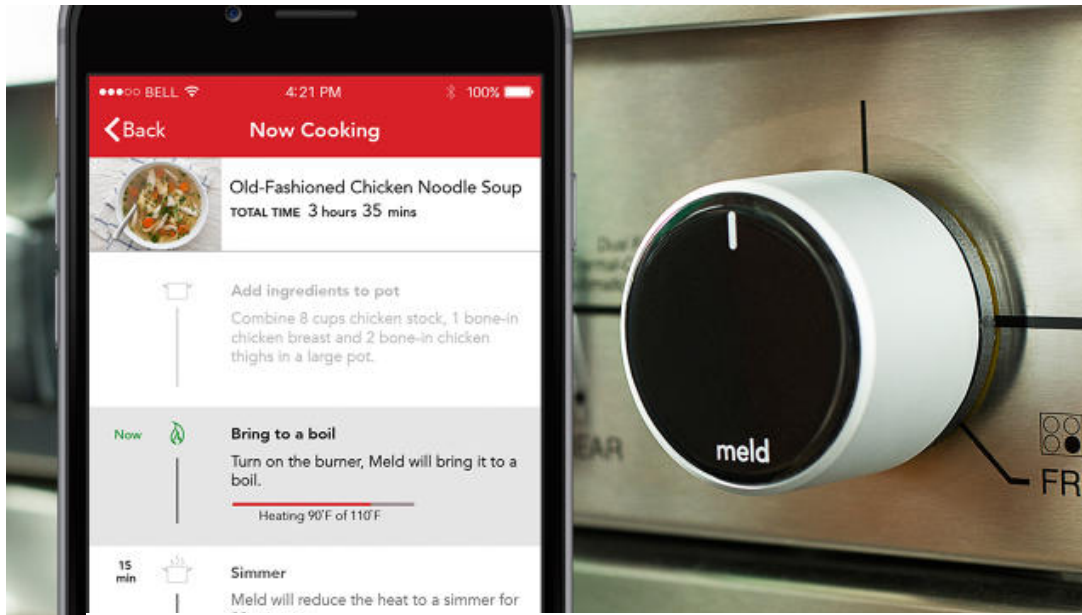
Smart-home heating startup Ecovent lands \$6.9M investment, touts \$1M in pre-orders



Energy Data via Backdoor of Cooking Culture



Temperature Control Precision Cooking
via *Knob, Clips & App*



Meld: A Perfect Meal Every Time

📍 Seattle, WA 🛠️ Gadgets

\$209,688

pledged of \$50,000 goal

Preparing for an Era of Connected Devices



Integration (and Advocacy?) of Networked Solutions:

- How do we interface with energy entrepreneurs and branded solutions?
- How do we guide our communities in making decisions on solutions?
- How do we learn from our community members who are early adopters?
- Might our showroom become a place to explore new Connected Devices?
- Might our members support specific *Kickstarter* projects?

Consumerization Phase implications for Energy sector?

Legacy Phase...

**Build out Access
to Infrastructure**



Consumerization Phase...

**Managed Services
& Behavior Change Solutions**

Social Norms for the Anonymous-Access Web

1993




“On the Internet, nobody knows you’re a dog.”

**“On Facebook, 273 people know I’m a dog.
The rest can only see my limited profile.”**

Social Norms & the Social Web

2008





Everyone knows I'm working on some personal growth issues

Assumption:
The web is becoming a platform for managing outcomes & personal behavior change.

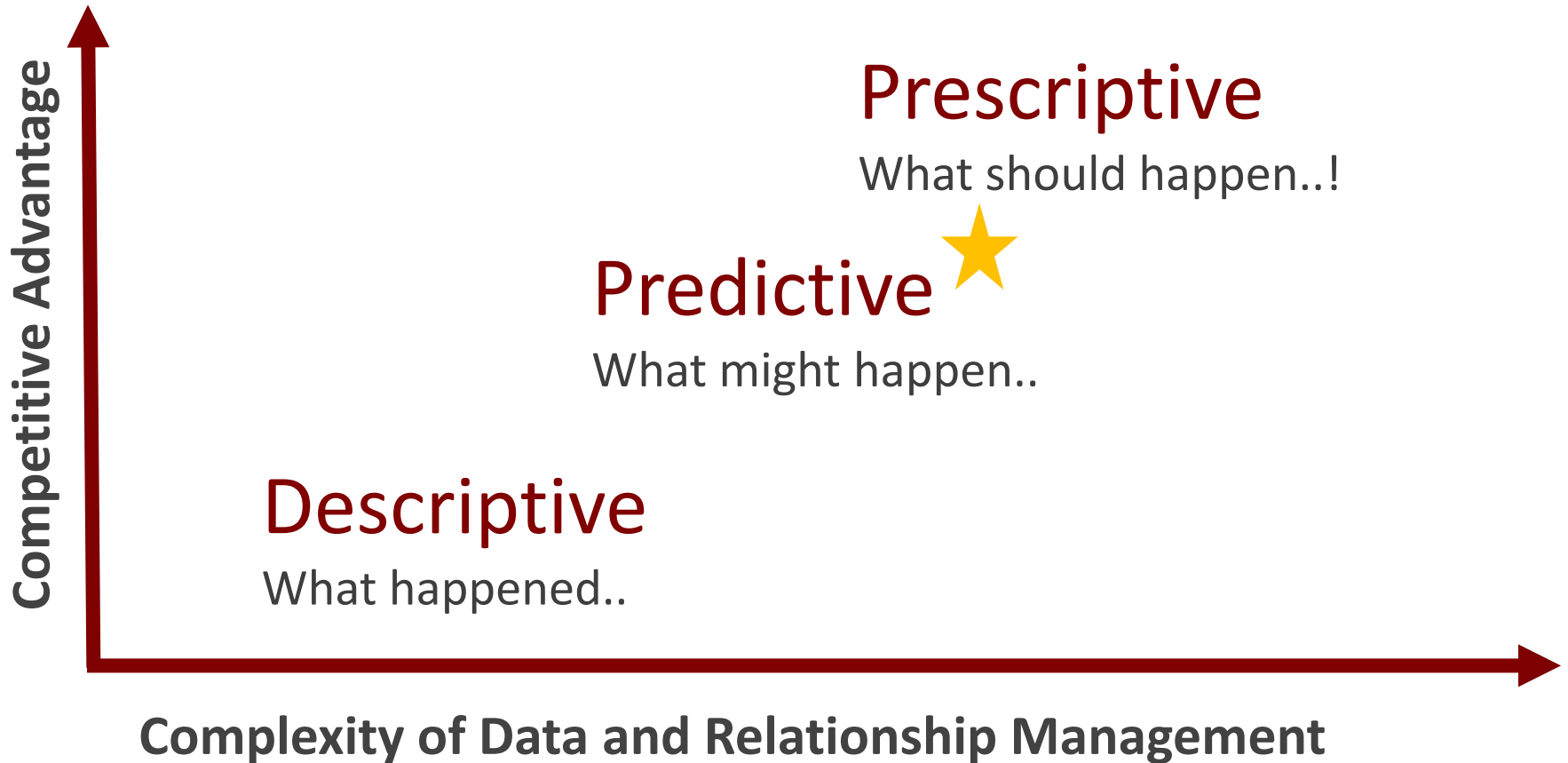
Andreas Arden

- *Management*—including state-of-the-art and creating an effective culture
- *Entrepreneurship*—including growing, staying afloat, and more
- *Dog Training 101*—including how to train, all about the dog as a book and more
- *Behavioral Psychology*—including personal learning, behavioral training, and more

BARRON'S

Service + Experience Design

How do we think of Behavior Change to Guide Outcomes?



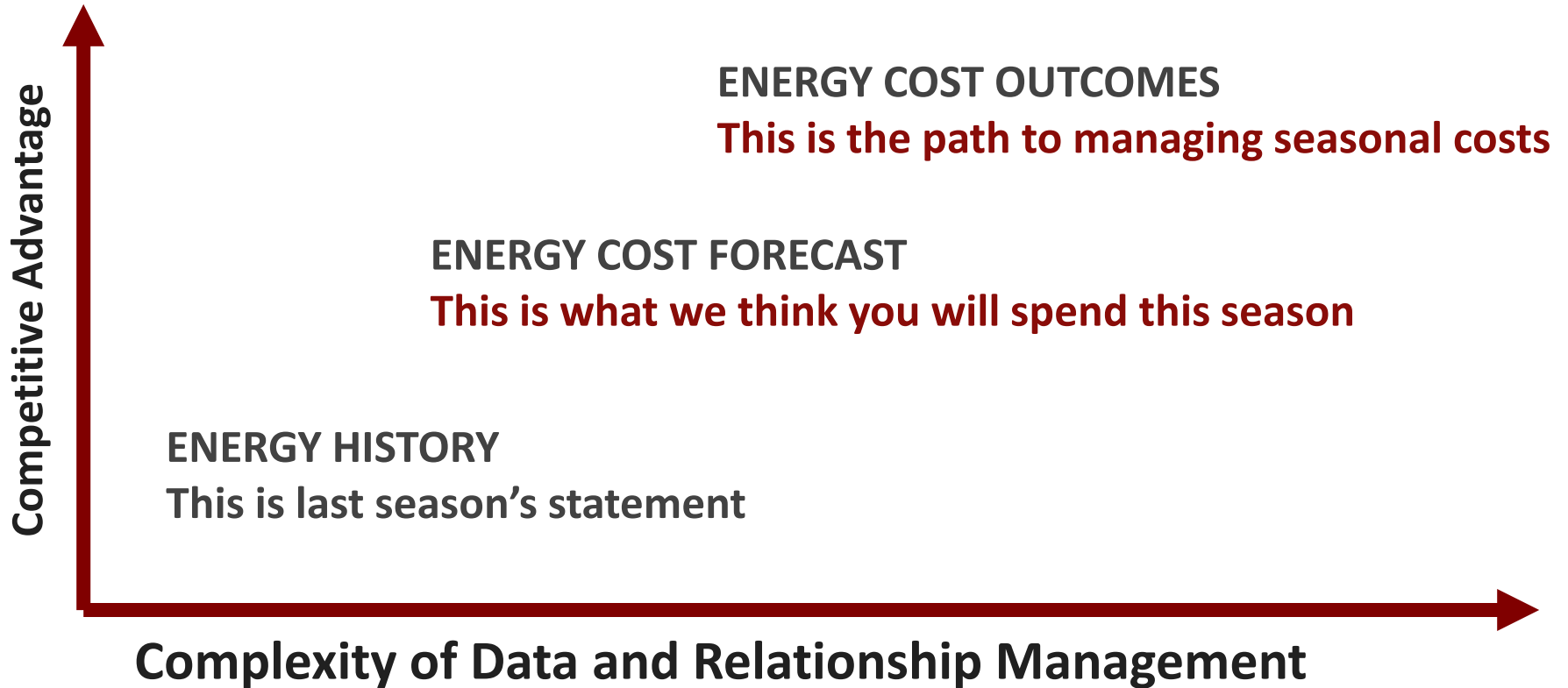
Behavior Change + Outcomes

Guided Financial Experiences



Behavior Change + Outcomes

Guided Utilities Experiences ?



IoT Consumerization

Question #1:

What outcomes matter?

- Comfort
- Informed Decision making
- Reliability (Uptime)
- Increased Savings
- ROI for Distributed Systems
- Fixed Costs
- Lower Carbon Footprint
- Worry-Free (Bill Management)

IoT Consumerization

Question #2:

How might we scale and deliver the prescriptive analytics experience?



neurio



ambient™
information at a glance.



INTRODUCING
amazon echo
Always ready, connected,
and fast. Just ask.

Can you tell me
why my bill was so
high?

Apps, Dashboards,
Ambient Objects,
Natural Language Assistants?

IoT Connected Home-Business: Role of Intelligent Assistants

Could natural language *assistants* emerge as a *tipping point* platform for Connected Home products + services?



How long will this heatwave last?

The Race to Build Intelligent Assistants



If you look at what Apple is doing with 'Siri,' what IBM is doing with 'Watson,' and what Google is doing with 'Now,' **it is clear that the most powerful technology companies are investing immense resources to make virtual intelligent assistants ubiquitous before the end of the decade.**

- Daniel Nadler, CEO of Kensho

2011: IBM's Watson – Game Show



2012-14: Enterprise Decision Support (Proof of Concept)

Healthcare

Helping doctors identify treatment options



MEMORIAL SLOAN-KETTERING
CANCER CENTER

Finance

Helping planners recommend better investments



Retail

Helping retailers transform customer relationships



Public Sector

Helping government help its citizens



Accelerated Research

Helping researchers find info faster



Home
What is Watson?
Implement Watson

Build with Watson
The Watson Ecosystem
Mobile Developer Challenge

About Us
Our Headquarters
Our Team
Careers
Academic Partnerships



Email IBM



Call 1-877-426-3774
Priority code: 109HF03W



Tweet us your questions



Like us



2015: Watson in the Cloud (Cognitive-Apps-as-Service)

ROSS

HOME ABOUT SIGNUP

Your brand new
**SUPER INTELLIGENT
ATTORNEY**

LEARN MORE

GVEC Internal Use and/or Business Clients

Decision Support that integrates:

- Connected Device Data**
- Grid Data**
- Weather Data**
- Demand Data**
- Enterprise Data**
- Economic Data**
- Workforce Data**
- Social Web Data**



Here's how Amazon plans to run your home – before Microsoft gets there

Dec 22, 2015, 6:21am PST

What about Consumers?

Voice-driven Hubs



INTRODUCING
amazon echo

Always ready, connected,
and fast. **Just ask.**



jibo

GVEC Services:

❑ Product Integration:

Use EchoAPI to elevate experiences with GVEC Home Service
(e.g. Daily changes; Product recommendations)

❑ Partnerships:

GVEC provides products and energy data insights to support Amazon's Connected Home efforts



INTRODUCING
amazon echo

Always ready, connected,
and fast. **Just ask.**



What about consumers?

Text chatbots

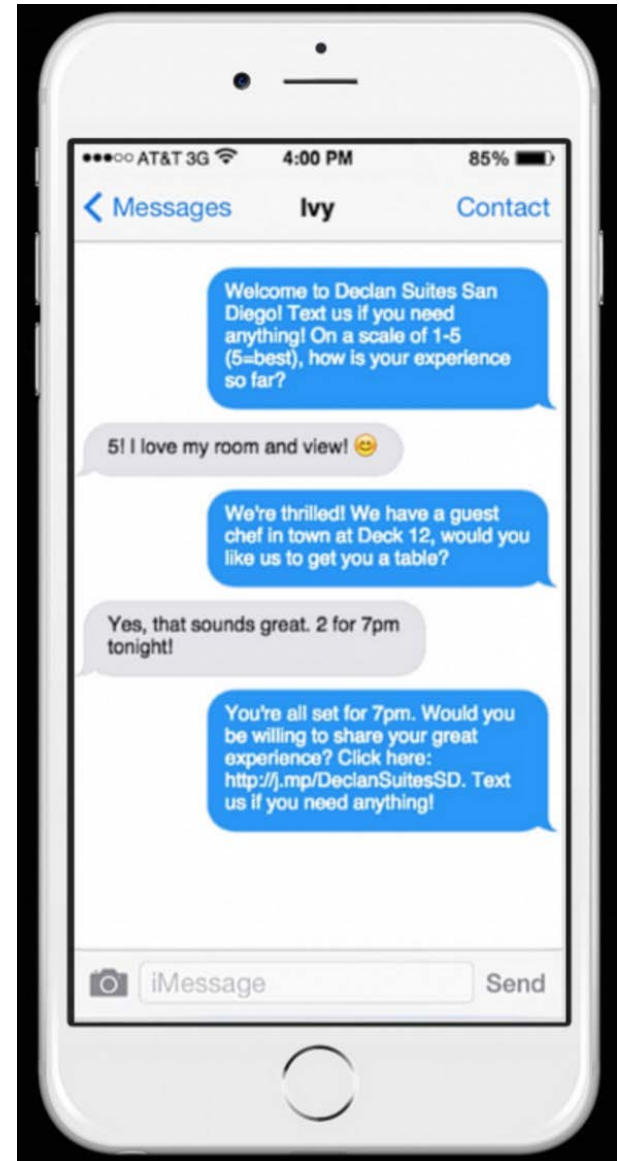
Buzzwords 2016:

ChatOps

Intelligent Texting

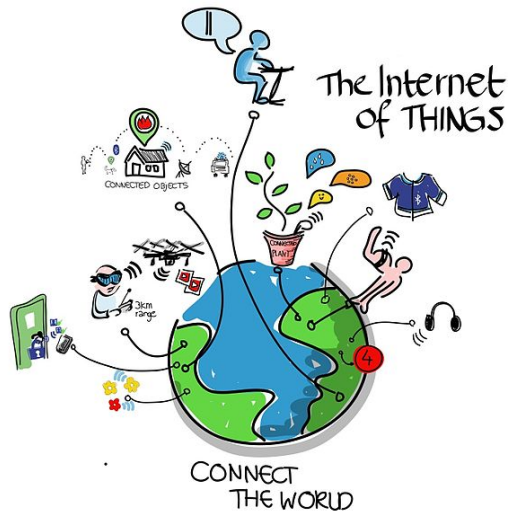
Messaging Apps

Conversational Commerce



Strategic Assumption: Elevated Expectations Ahead

Connected Devices Alters Landscape of Energy Solutions



Strategic Questions

- Which outcomes matter to members?
- How do we build analytics capacity?
- How do we establish key partnerships?
- Where might we test pilots?
(e.g. aging populations, commercial)



Opportunities + Risks

**How might we *deliver the unexpected*
in an era of Connected Devices?**



Disruptive Trends to Watch:

The Slow Pace of Fast Change



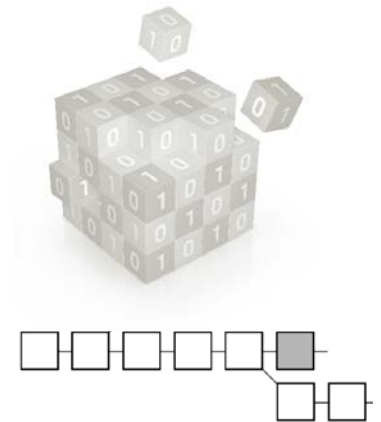
IoT + Consumerization
of Energy Solutions



**Data-driven
Workplace**



Distributed
Resources



Blockchain
Contracts

**What if we saw a revolution in
data-driven talent culture?**

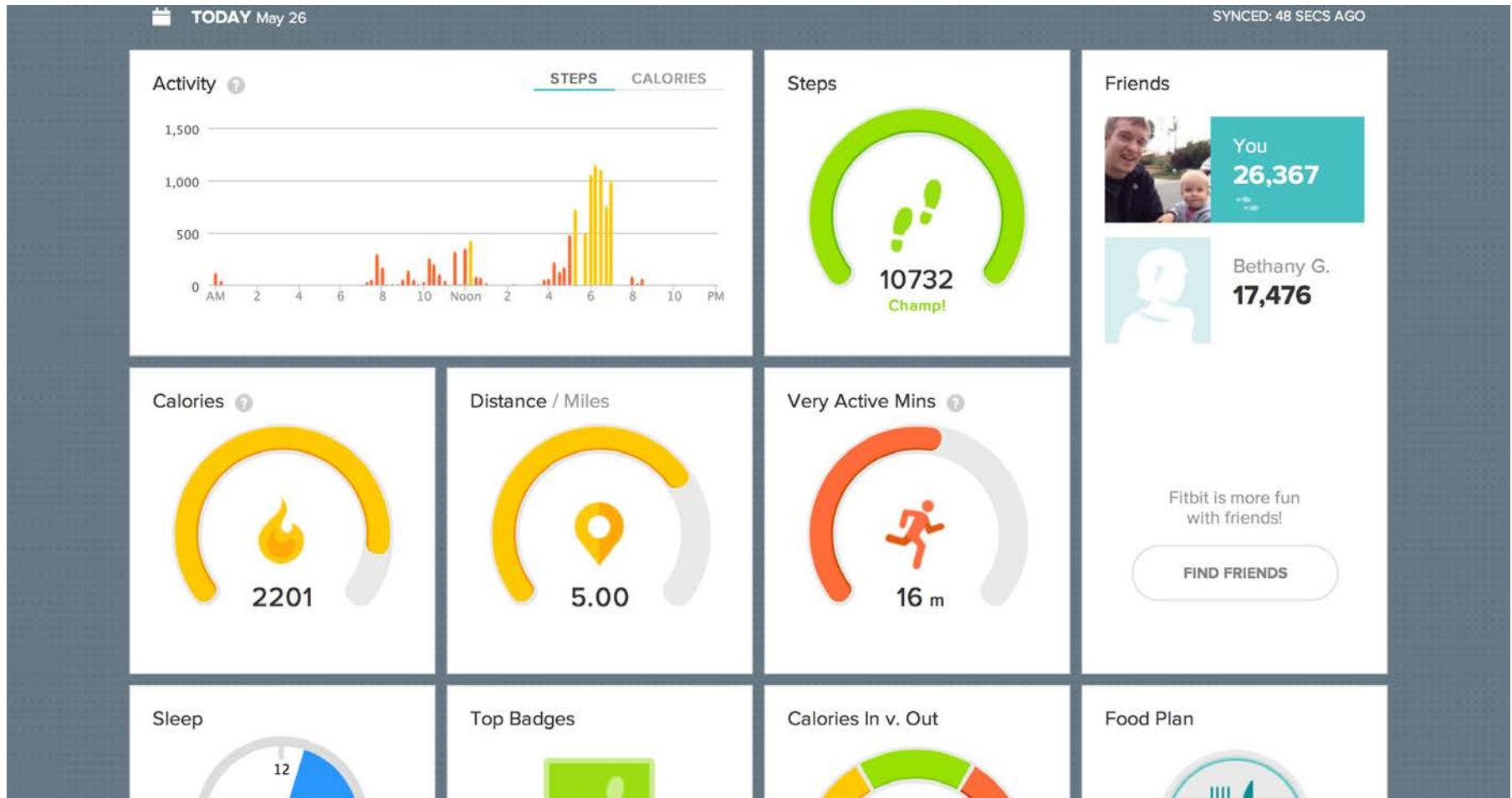
**Learning Analytics +
Performance Support**

EXPERIENCE
API

Data + Algo-Driven World

The Creepy vs Compelling Line of...

Personal Data on Health + Wellness



**The Creepy vs Compelling Line
Conversation is coming to Work...**



EXPERIENCE
 API

**Learning +
Performance Analytics**

Weak Signal: Buzz on Talent Analytics + Performance Support

Training Culture

- Put *inside* person
- Instructor-focused
- Event-based (Class)
- Centralized (Formal)
- Linear (Sequential)
- Delivery (Output)

Learning + Performance Culture

- *Grows out* of personal effort
- Learner-focused
- Continual / On-demand (*Chunks*)
- Decentralized (Hybrid)
- Non-linear (Contextual)
- Results (Outcomes/Impact)

Where do workers apply what we learn in training?

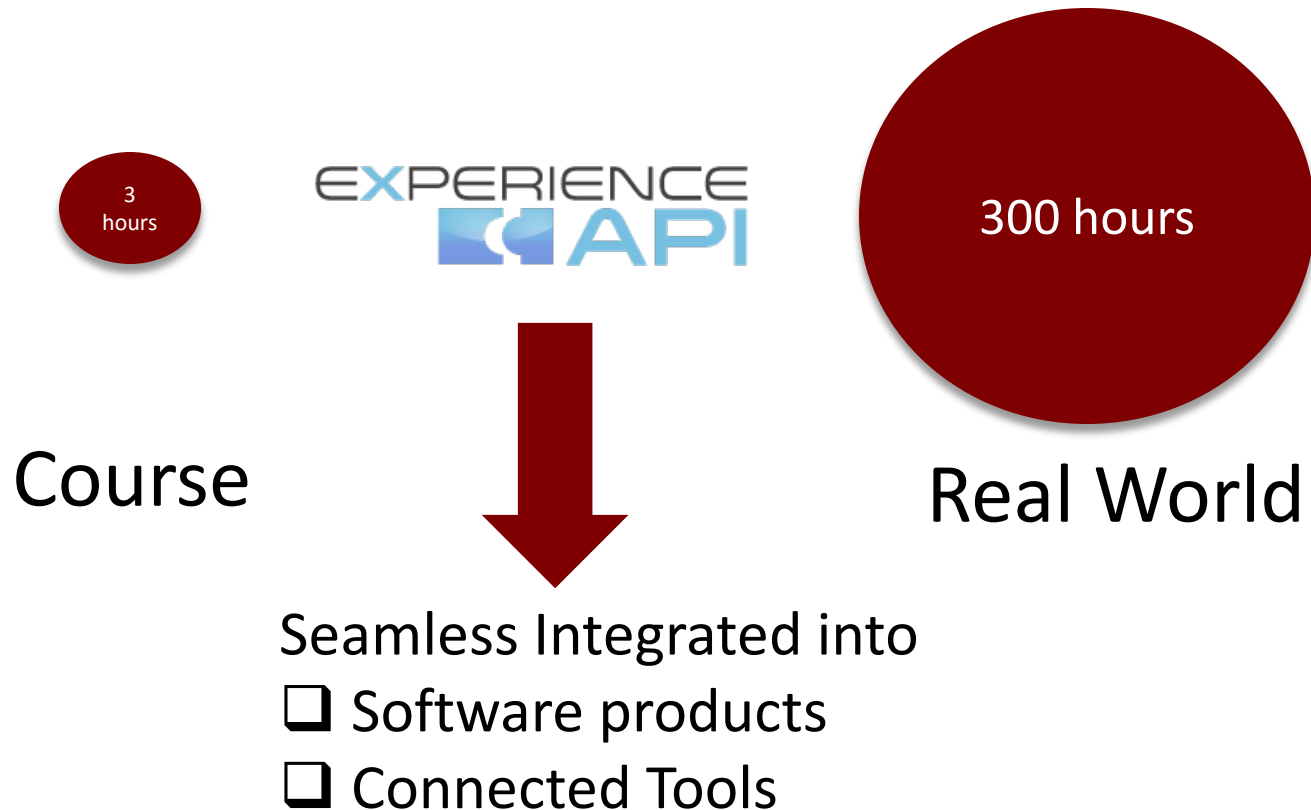


Course



Real World

What if we shifted Support from Training to Performance?
What if we could link experiences and pathways to outcomes?



xAPI Performance Analytics driving Engagement



“I did this...” Statements

- Rosa ***watched*** a Youtube video on Aging populations
- Rosa ***completed*** a MOOC class on designing homes for aging populations
- Rosa ***funded*** a Kickstarter project on home robotic assistant for seniors
- Rosa ***followed*** MIT Aging Labs director Tom Coughlin on LinkedIn and Twitter
- Rosa ***attended*** an MIT workshop on Aging in Place
- Rosa ***wore*** an ‘aging suit’ while visiting the MIT Aging Lab
- Rosa was ***mentored*** by Russell Jones, Aging Service Design Expert
- Rosa ***wrote a blog post*** on aging in place & energy sector for APPA
- Rosa ***wrote*** a proposal on new aging-in-place energy product-service concepts
- Rosa ***presented*** a business plan to GVEC Board on business model
- Rosa ***promoted*** to GVEC Head of Aging of Place solutions

Field Experiences
I did this...

EXPERIENCE
 API





Showroom experiences
I did this...

gvechome
Your kind of power.

Situational Awareness View of Managers



Experience Streams

<Actor, Verb, Object>

"I did this"



Learning Record Store (LRS)

- Individual Control over Access to Learning Data

**Interventions: Self-directed Learning,
Performance Support, Training**

What you can do with xAPI...



Managers + Employees

- Create a culture of continual learning
- Anticipate team capacity for addressing situational opportunities or challenges
- Reveal just-in-time opportunities to provide Performance Support
- Make connections between training + performance support to business outcomes

LOTS of Uncertainties + Unknowns!

Don't hate on Garry

Creepy and Compelling ...

- Not perfect but better than today
- Learning + Performance Analytics is desired asset of employees and organizations
- Make performance analytics about 'professional development' not 'disciplinary action'
- Create Aggregate Profiles of Learning Pathways Across Orgs

Opportunities + Risks

**Shifting towards data-driven and
performance support team culture?**



Disruptive Trends to Watch:

The Slow Pace of Fast Change



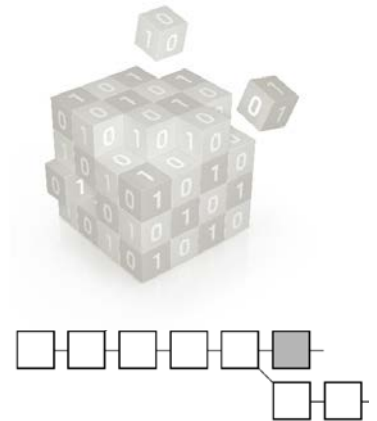
IoT + Consumerization
of Energy Solutions



Data-driven
Workplace



**Distributed
Resources**



Blockchain
DApps

Is there 'Disruption' ahead with Distributed Power?

May 23, 2014, 11:45 A.M. ET

Barclays Downgrades Electric Utility Bonds, Sees Viable Solar Competition

On Rooftops, a Rival for Utilities

Solar panels north of Los Angeles. Power companies say such systems are draining away their customers and profits.

By DIANE CARDWELL
Published: July 26, 2013

Moody's: Cheap Batteries Could be 'Credit Negative' for Utilities and Power Generators



Deloitte.

The new math.

Solving the equation for disruption to the U.S. electric power industry

Deloitte Center
for Energy Solutions

Strategy #1:

Embracing Policy + Consumer-driven Dynamics of Rooftop Solar





Strategy #2:

Distributed, centrally controllable *behind-the-meter* energy storage

ENERGY STORAGE

Duke Energy Teams Up With Green Charge Networks for Behind-the-Meter Batteries



Hawaii and Southern California are the target markets for the partnership.

by Jeff St. John
December 08, 2015



Strategy #3: Participate in Aggregated System level Solutions

"Community Storage" is an emerging term for programs that aggregate distributed energy storage resources that are located throughout a community, such as water heaters, electric vehicles, and interconnected storage batteries, to improve the operational efficiency of electric energy services to consumers.



The Community Storage Initiative

[Join Our Email List](#)

The co-founders of the community storage initiative ask for your support:

- Click on the link above to join the Initiative's email list to receive information about the Initiative and upcoming events
- Promote an "above the baseline" approach to electric water heating, electric vehicle charging, and residential battery use marketed as "Community Storage"
- Share your business model and best practices around "Community Storage"

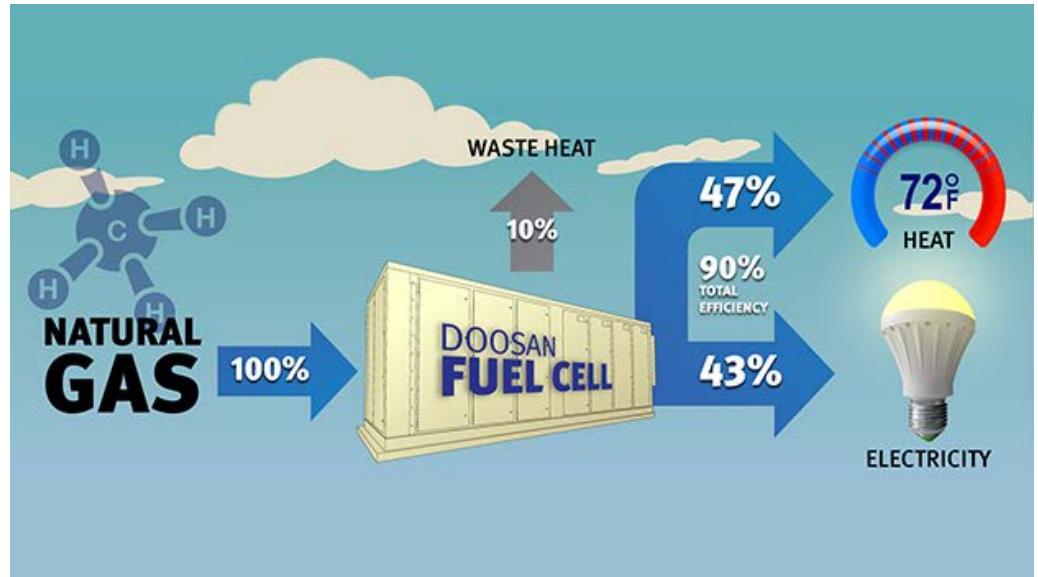
We ask you to follow the Guiding Principles of The Community Storage Initiative:

1. Voluntary Participation (by the utility, home, business or individual)
2. Education & Training (information resources, program templates, quick-start guides, etc.)
3. Market Acceptance (locally, regionally and nationally)

Strategy #4: Explore Fuel Cells as base of Micro Grids



Bloomenergy



DOOSAN

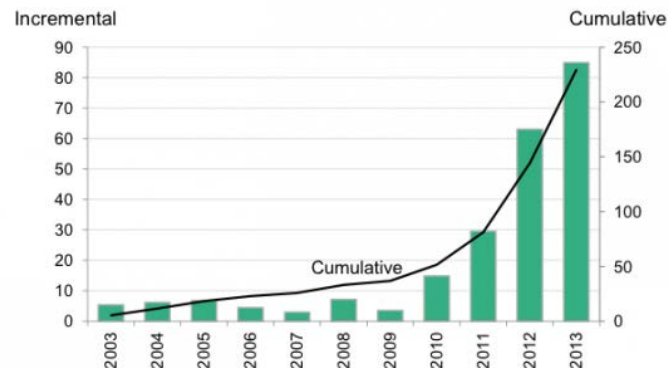
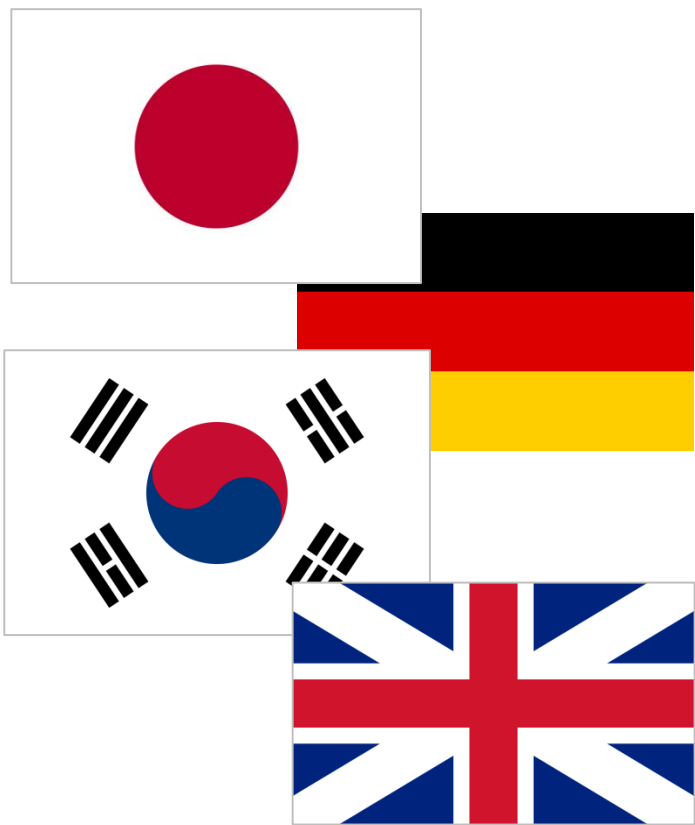
Strengthening Signals but Lingering Scars

Rise (and Return) of Distributed (Gas) Power Generation

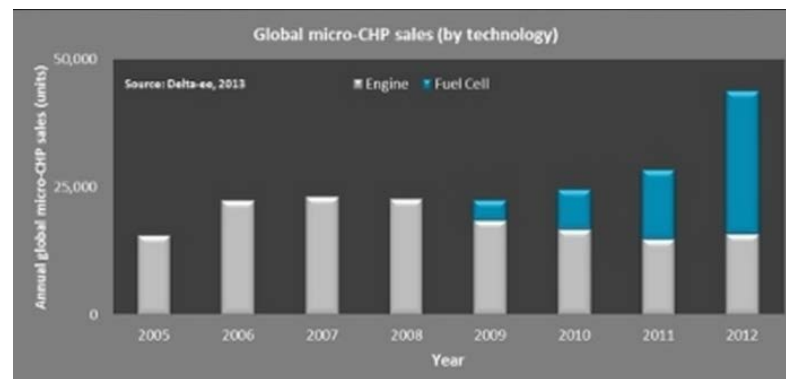
Strengthening Signals on State-sponsored Industrial Policies

Distributed Scenario: Global Market Expansion as Energy Appliance

Look Beyond California & Elon Musk...



Technology Shift in Micro-CHP: Fuel Cell Outsales Engines for the First Time



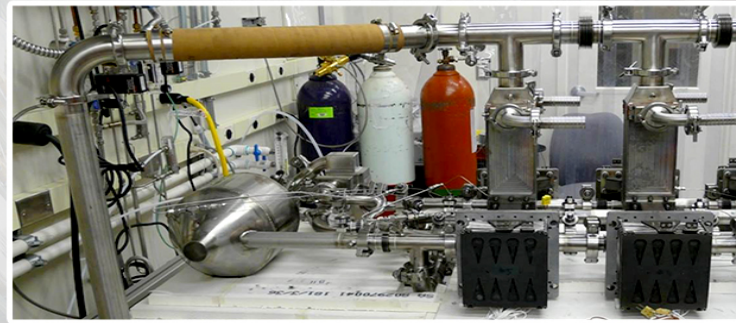
Distributed Driven by: Cost/Capital, Resilience & Control



33%
LESS
Up-Front Cost



15%
LESS
CO₂ Emissions



NATURAL GAS FUEL CELLS

Big enough to power a large retail facility onsite, a scaled-up version based on PNNL's fuel cell design could cost less to build and emit fewer greenhouse gases than a natural gas combined cycle power plant.

The PNNL study showed that for the same power output, a natural gas solid oxide fuel cell would cost almost one-third less to build than a centralized natural gas combined cycle plant.

GE Enters Market in 2018 (1MW – 10MW)

Fuel Cost of Generation (\$/MWh)

	Heat Rate [LHV] (Btu/kWh)	Conversion Efficiency (%)	\$4/ MMBtu	\$6/ MMBtu	\$8/ MMBtu	\$10/ MMBtu	\$12/ MMBtu
Existing Coal Plant (US Average)	9,609	36%	\$40	\$61	\$81	\$101	\$121
Gas-Fuelled Reciprocating Engine (US Average)	8,632	40%	\$38	\$57	\$77	\$96	\$115
Existing Natural Gas-fired Gas Turbine Combined Cycle (US Average)	6,913	49%	\$31	\$46	\$61	\$77	\$92
Solid Oxide Fuel Cell— Simple Cycle	6,690	51%	\$30	\$45	\$59	\$74	\$89
New Natural Gas-fired Gas-Turbine Combined Cycle Plant	5,503	62%	\$24	\$37	\$49	\$61	\$73
GE-Fuel Cells FC-CC*	5,249	65%	\$23	\$35	\$47	\$58	\$70

*Expected conversion efficiency of the new FC-CC will be 60 to 65 percent.

Source: GE and US Energy Information Administration, Form EIA-860, *Annual Electric Generator Report*.

Distributed Scenario: Solar Fails to Scale vs Energy Appliances

Bloomberg Businessweek



■ Toho Gas units for an "ene-farm" household fuel cell system sit outside a smart home developed by Toyota in Toyota City, Japan, on Oct. 17, 2014. Photographer: Kiyoshi Ota/Bloomberg

Redox Power Plans To Roll Out Dishwasher-Sized Fuel Cells That Cost 90% Less Than Currently Available Fuel Cells



Plausible Paths:

- 1) Subsidies & cost reductions = Viable Products
- 2) Localized MW Power Parks = Utility Micro Grids
- 3) NatGas + DG Managed Service = Clean Energy as Service

Scenario to Explore

What if our Communities Embrace Natgas + Distributed Generation?

Walmart  amazon.com 



Panasonic

Honeywell

Bringing Value to Our Communities Ownership or Managed Services Future ?

- ✓ Design-Build-Manage (Finance to Fuels)
- ✓ Accelerate Regulatory Reforms
- ✓ Fuel contracts & management
- ✓ Restructure Partnerships
- ✓ Align Talent & Culture Change
- ✓ Develop Roadmap Adoption Rollout

Competition or Coopetition?

Opportunities + Risks

**How might DER and Micro-Grid
models deliver the unexpected?**



Disruptive Trends to Watch:

The Slow Pace of Fast Change



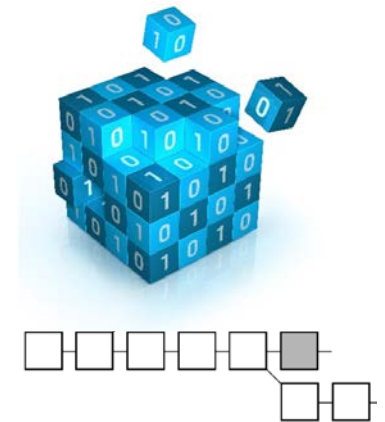
IoT + Consumerization
of Energy Solutions



Data-driven
Workplace

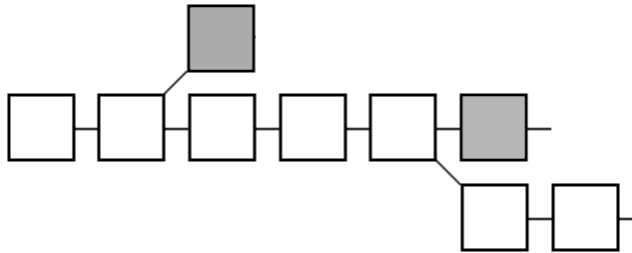


Distributed
Resources



**Blockchain
DApps**

Connected Devices (IoT) Meets Blockchain + Smart Contracts



- ❑ The blockchain is a networked based **distributed ledger** that can support cryptographically secure **'smart contracts'** that **automate business processes** and transactions.
- ❑ The database is immutable and provides instant authentication and settlement.
- ❑ Blockchain-based **DApps (Decentralized applications)** could create low cost, high trust-based **'smart contracts'** for financial instruments, audits, **private data security**, property titles, consumer web applications, **P2P energy trading**, **internet connected device solutions**.

Unleashing Tradeable + Programmable Assets

What's Possible?

Financial Services (Equities to Escrow)

The Network is Bank (e.g. Bitcoin)

Property Records

House Deeds; Vehicle Titles;
Land Titles for Access to Credit

Transportation Networks

Uber without Uber

Healthcare Records

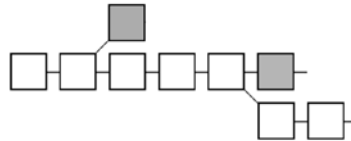
Automating Insurance Claims; Reducing Fraud

Internet of Things (IoT)

Security; Managed Services; Resource Trading

Energy Networks

Peer-to-Peer Energy Trading
Autonomous Devices





World Economic Forum Survey Projects Blockchain 'Tipping Point' by 2023

**By 2025, 10% of of Global GDP
will be orchestrated by
blockchain applications.**

Banks and exchanges turn to blockchain - FT.com
www.ft.com

“Blockchain technology continues to redefine not only how the exchange sector operates, but the global financial economy as a whole,” says Bob Greifeld, chief executive of Nasdaq.

Chris Sturt

Technology | Fri Jan 22, 2016 2:03am EST

Australia's ASX set to lead in blockchain for public companies

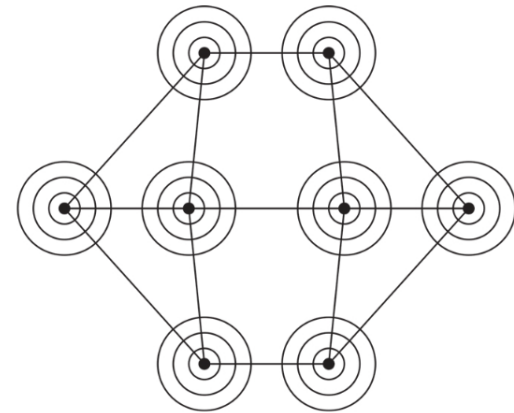
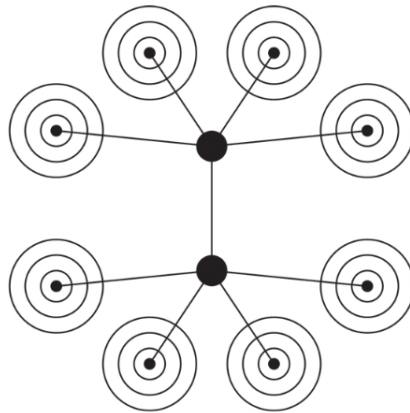
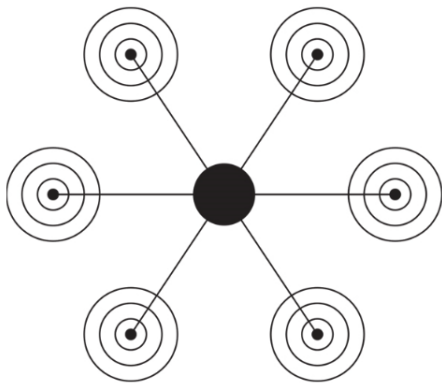
SYDNEY | BY SWATI PANDEY

Asia's Largest Stock Exchange Operator Partners IBM for Blockchain Applications

🕒 16/02/2016 👤 Samburaj Das 💬 0

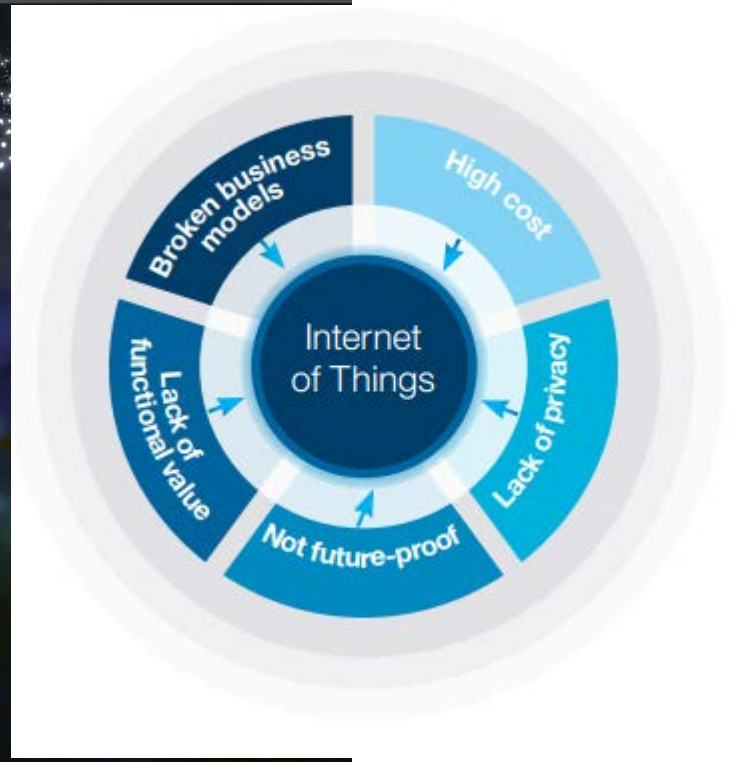
Potential Capabilities of a Blockchain Empowered Homes + Businesses

- Resilient; Attack Resistant
- Privacy + Security
- Autonomous Device Coordination
- Inter-device Agreements + Payments (e.g. Resource Sharing)
- Industry wide data standards
- Compliance + Auditing
- Maintenance Service Requests
- Low cost Legal Contracts
- Value Capture of *Negawatt*



IBM Reveals Proof of Concept for Blockchain-Powered Internet of Things

Stan Higgins | Published on January 17, 2015 at 19:12 GMT



Device democracy

Saving the future of the Internet of Things

Accenture's blockchain smart plug to cut electricity bills

19 February 2016 Hits: 86

Accenture has developed a blockchain-based smart electric plug for adjusting power consumption. The device will be able to choose between power suppliers and pick up the cheapest tariffs.

The automated system working on behalf of its owner can decide every minute which supplier to switch to in order to keep to the lowest cost.

“Instead of just resolving and confirming transaction records, the Accenture work has changed the blockchain to let it negotiate deals on behalf of its owner,” [writes](#) BBC.

Energy Sector Incumbents Connecting to Blockchain Developer Community



Carsten Stoecker
Innovation@RWE



Blockchain-based EV Charging Network



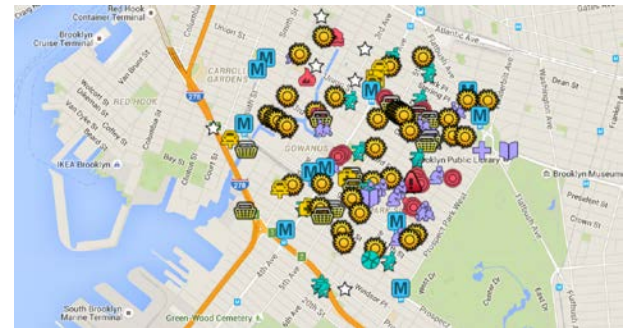
BlockCharge - EV Charging via the Ethereum Blockchain (HQ)



Micro Grids: Neighbor-to-Neighbor RECs Trading

Open energy platform is transparent, auditable, non-repudiable, peer-to-peer, and cryptographically secure.

Friction in the market is reduced by allowing different classes of users to transact openly on the platform.



LO3 ENERGY

Crypto IoT + Energy Platforms to Explore



SolarCoin is an alternative digital currency that works like air-miles for Solar electricity generation.



Solcrypto is developing IoT hardware and software technology with energy monitoring devices on the grid-edge that link directly with the decentralized global transparent SolarCoin blockchain and other blockchains.



Newly established consortium of companies and organizations involved in crypto application for *Internet of Things*.



Iota is a decentralized micro-transactions cryptocurrency developed for an IoT ecosystem. It is built on top of 'Tangle' – a variation of the blockchain database.

Possible Slogans 2025-2035

Connected Business: Age of Energy Blockchain Services

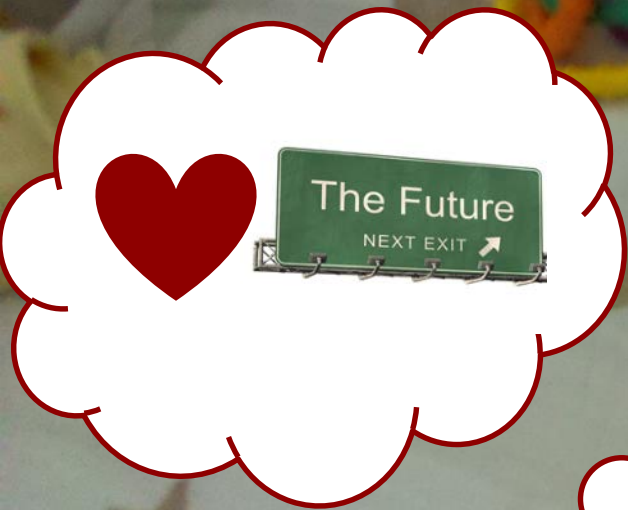
*“Sell More of
What you Produce”*

*“Our DApp Devices will
Drive Down Energy
Costs”*

*“The Network is Your
Energy Company”*

I don't
like the
future...





Every day I make an effort to go toward
what I don't understand.

Yo-Yo Ma



*Warm up
Foresight 101*



Drivers of Change
IoT Consumerization
Data-driven Workplace
Distributed Resources
Blockchain Emerges



Next Steps

Create a Healthy Sense of Urgency

On the Plateau *'Managing the Decline'*

- Incumbent mindset
- Incremental Improvement
- Fear, Uncertainty,
Doubt & Denial

Walking up Hill *Enabling New Era*

- Entrepreneurial mindset
- *Prototyping*
Transformative Change
- *Failing Forward*

Strategic Activity: Describe Our Four Futures

?

**Continued
Growth**

?

**Disciplined
- Constrained**

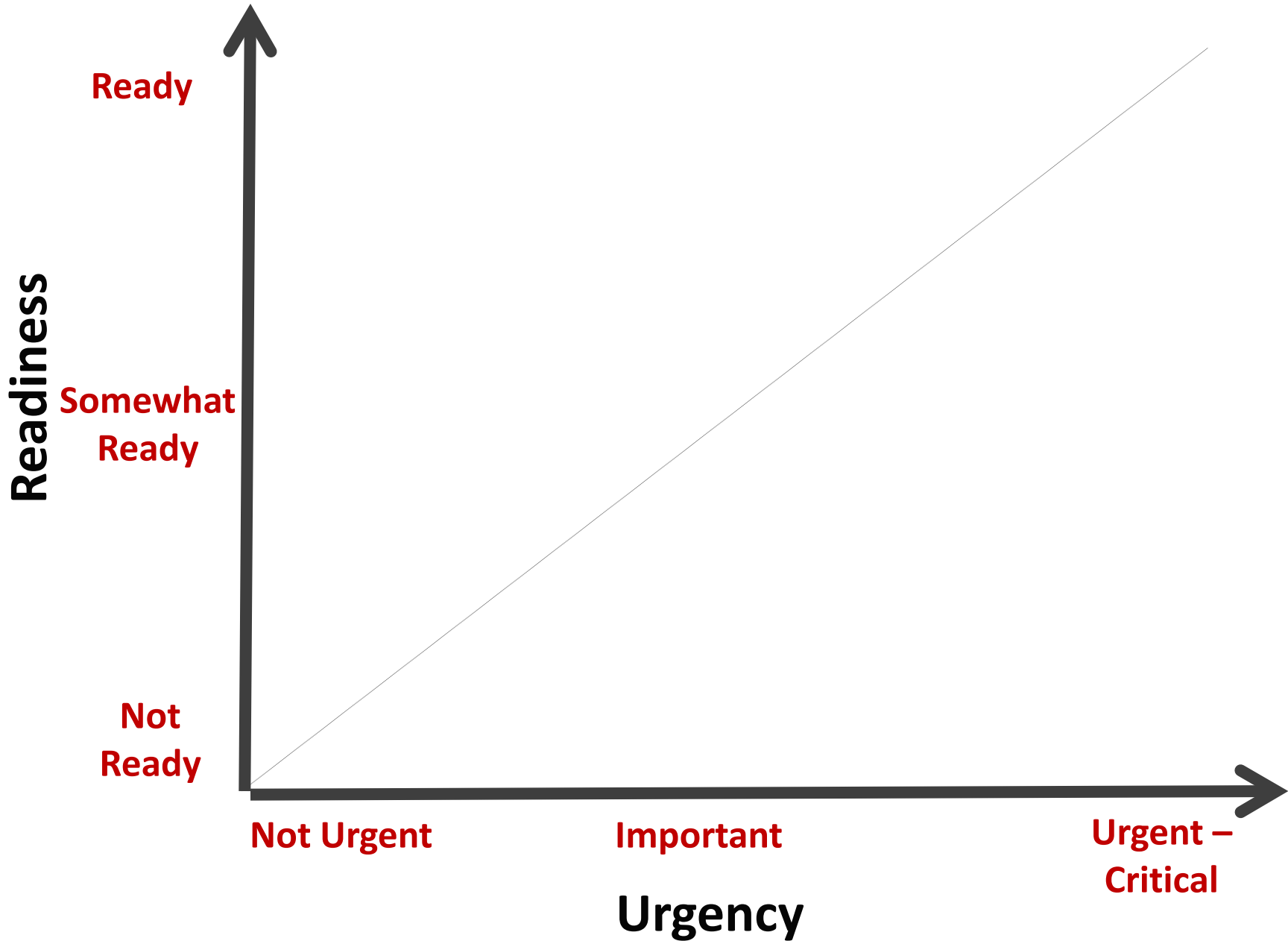
?

Transformed

?

**Decline
- Collapse**

Survey Leadership on Emerging Trends



Establish Thought Leadership + Curator Role on Big Ideas

Engage staff, elected officials and community leaders in socializing 'big ideas' on the horizon of the energy sector.

- ❑ Energy Entrepreneurship
- ❑ Distributed Generation
- ❑ Business Model Challenges
- ❑ EVs (Battery + Fuel cells)
- ❑ Connected Devices + IoT
(Data-Privacy-Security)
- ❑ Blockchain + Crypto DApps
IBM ADEPT Protocol (Ethereum)
Transactive Community Grid



Give Structure to Innovative Thinking!

Use 'Killer Questions' to Brainstorm Ideas



killerquestion killerquestion

#KQ What **#customer** **#segment** will emerge in 5 years that doesn't exist today? <http://om.ly/ytUv>

28 Oct

Thank You!!

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Two Rs



Disruptive Trends to Watch:

The Slow Pace of Fast Change



**IoT + Consumerization
of Energy Solutions**



**Data-driven
Workplace**



**Distributed
Resources**



**Blockchain
DApps**