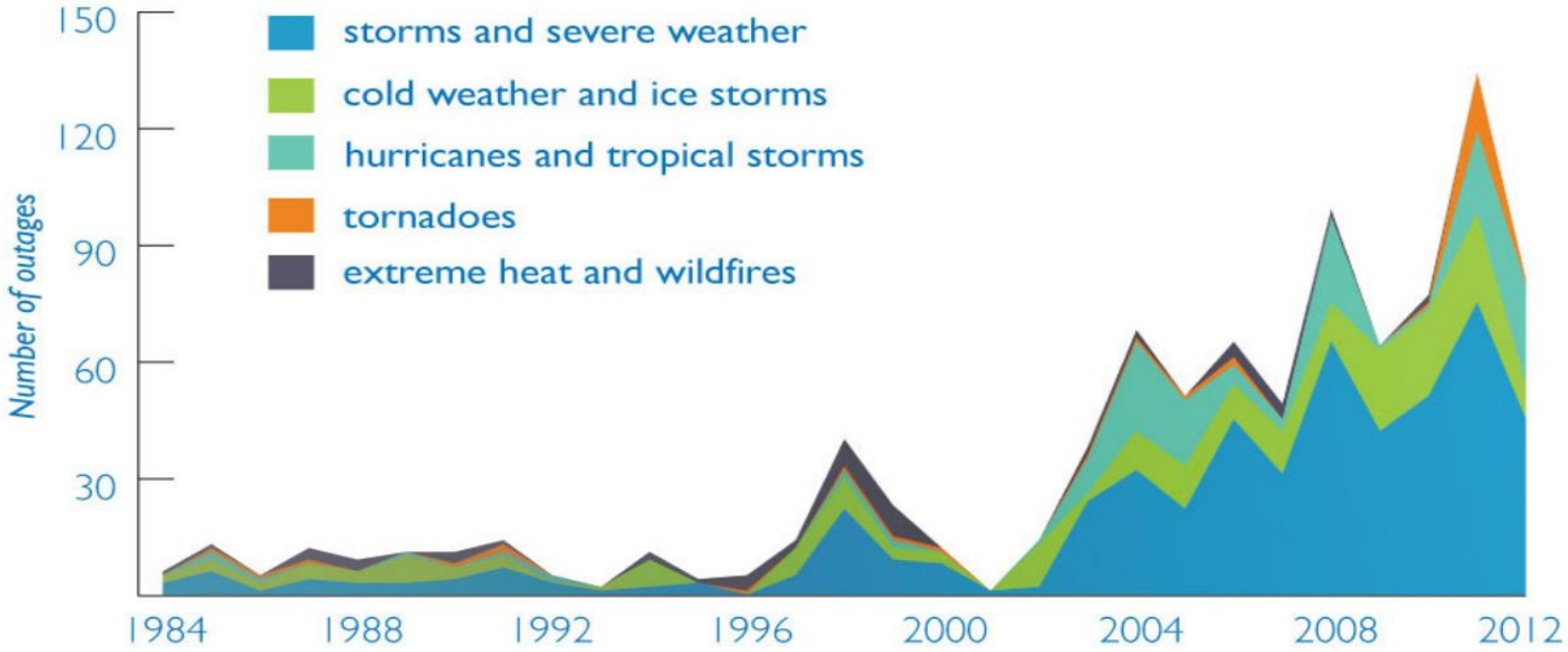
Harmony in a world of disruption

Kerrick Johnson, Co-Founder & Chief Ecosystem Officer


Maine
Vermont
New York
New Hampshire
Massachusetts
Connecticut
Rhode Island

Extreme Weather Is Causing More Major Power Outages

(major = at least 50,000 customers affected)



Source: "Blackout: Extreme Weather, Climate Change and Power Outages" (Climate Central)

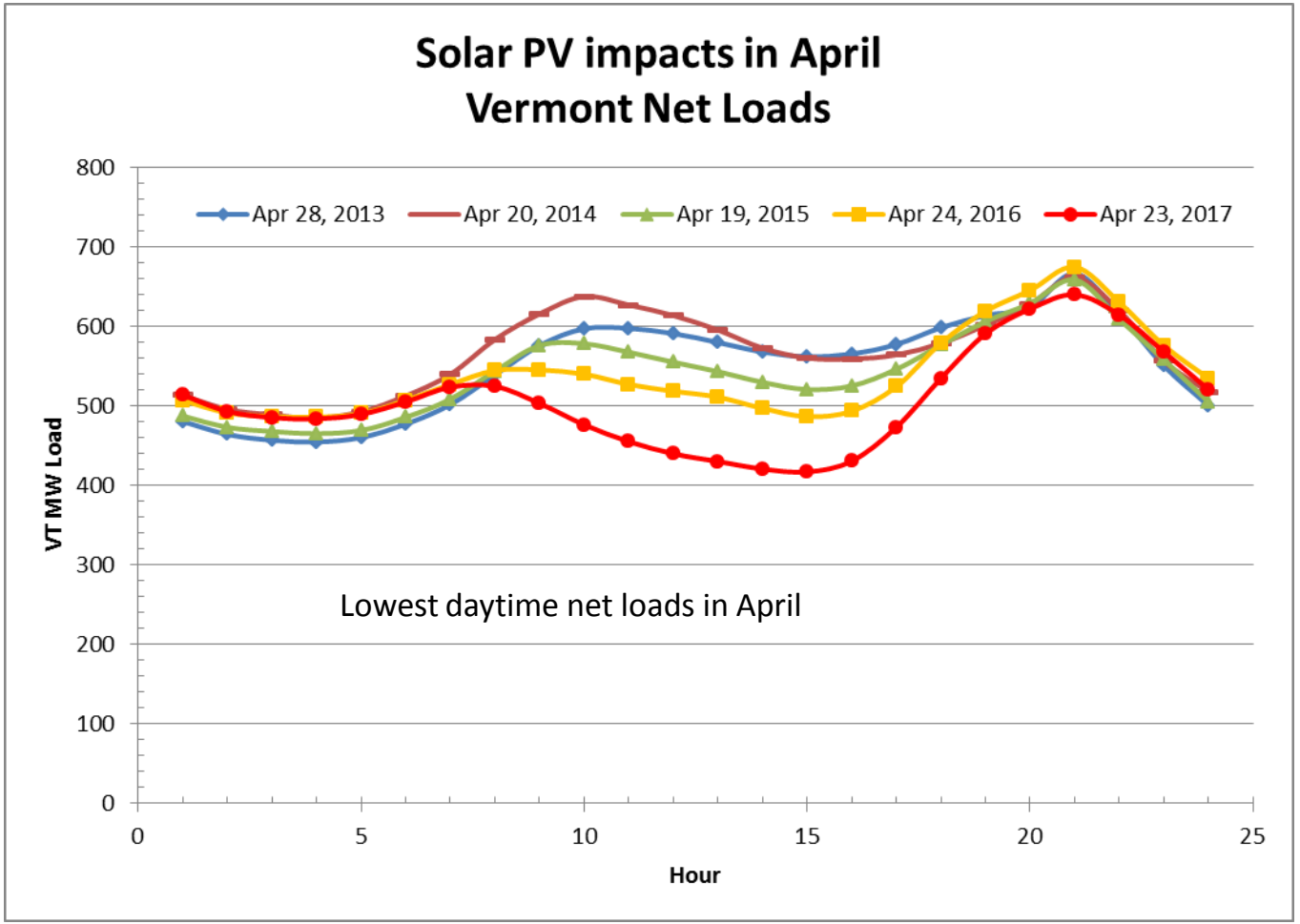
CLIMATE CENTRAL

Global Risks Report

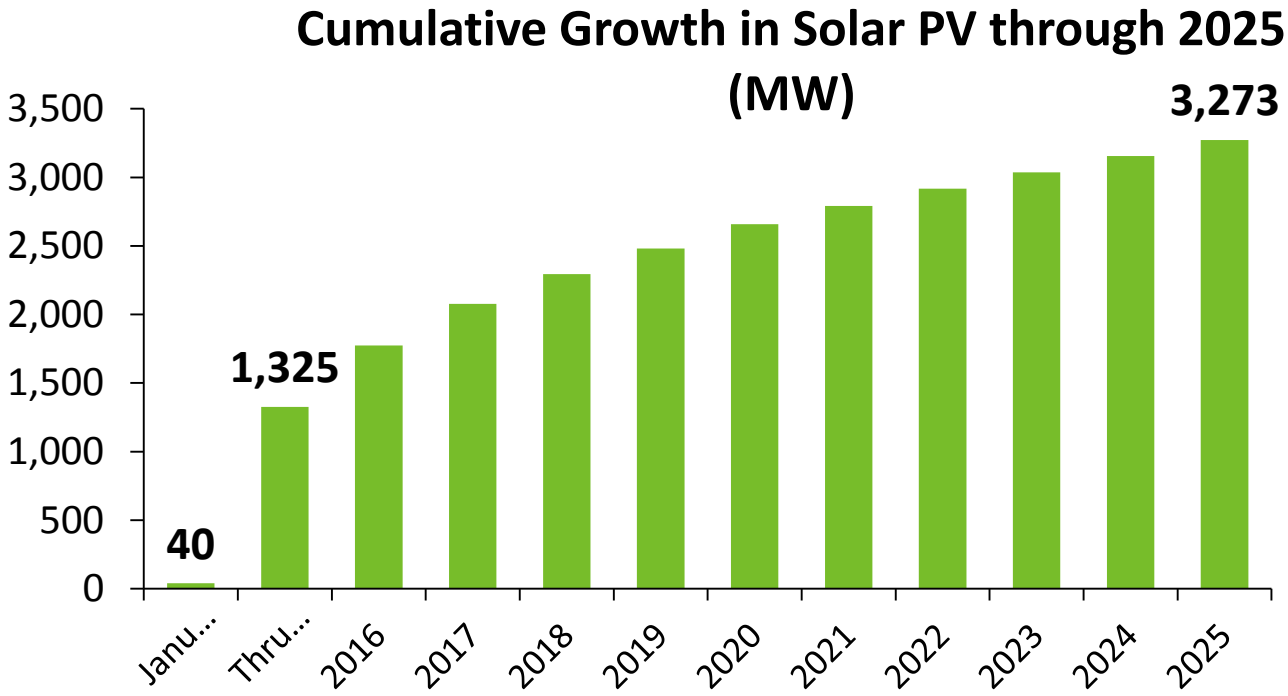
The 5 risks that will have the biggest impact in the next 10 years

	rank
Weapons of mass destruction	1
Extreme weather events	2
Natural disasters	3
Failure of climate change mitigation & adaptation	4
Water crises	5

Source: Global Risks Perception Survey 2017-2018, World Economic Forum

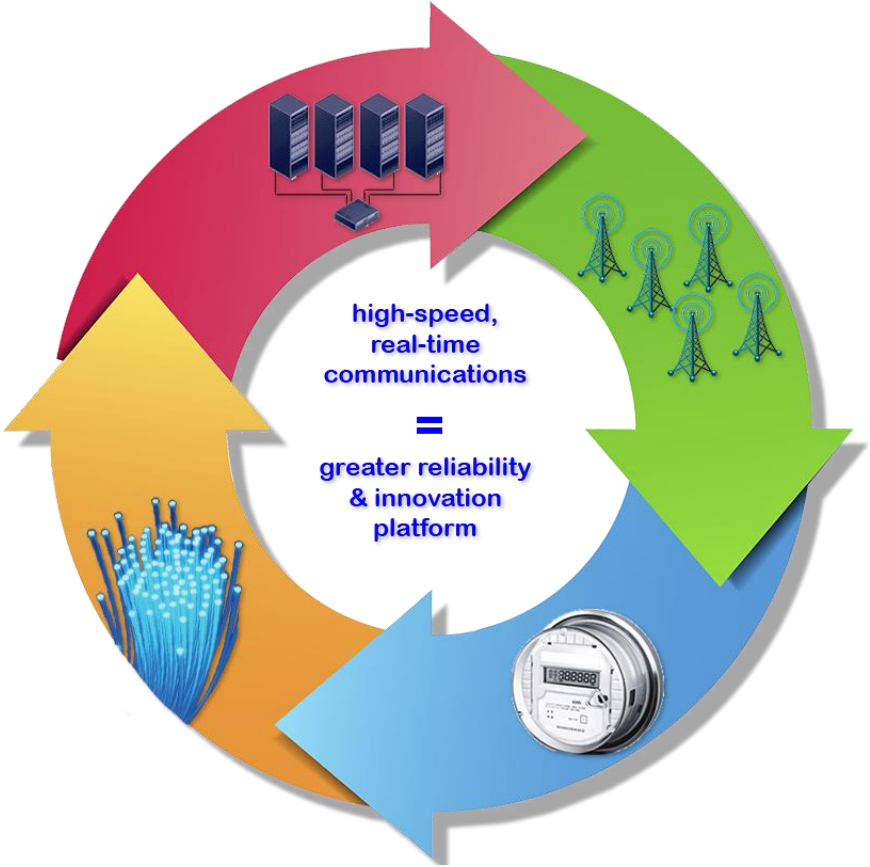

Solar PV impacts in April
Vermont Net Loads
Apr 28, 2013
Apr 20, 2014
Apr 19, 2015
Apr 24, 2016
Apr 23, 2017
VT MW Load
800
700
600
500
400
300
200
100
0
0
5
10
15
20
25
Hour
Lowest daytime net loads in April

ISO New England Forecasts Strong Growth in Solar PV



Note: This chart reflects the ISO's projections for nameplate capacity from PV resources participating in the region's wholesale electricity markets, as well as those connected "behind the meter." Source: Final 2016 ISO-NE PV Forecast (April 2016); MW values are AC nameplate.

Innovation requires communication



Statewide infrastructure

- Smart meters
- Fiber optic network
- Radio system
- High-performance computing cluster—HPCC

Vermont Weather Analytics Center

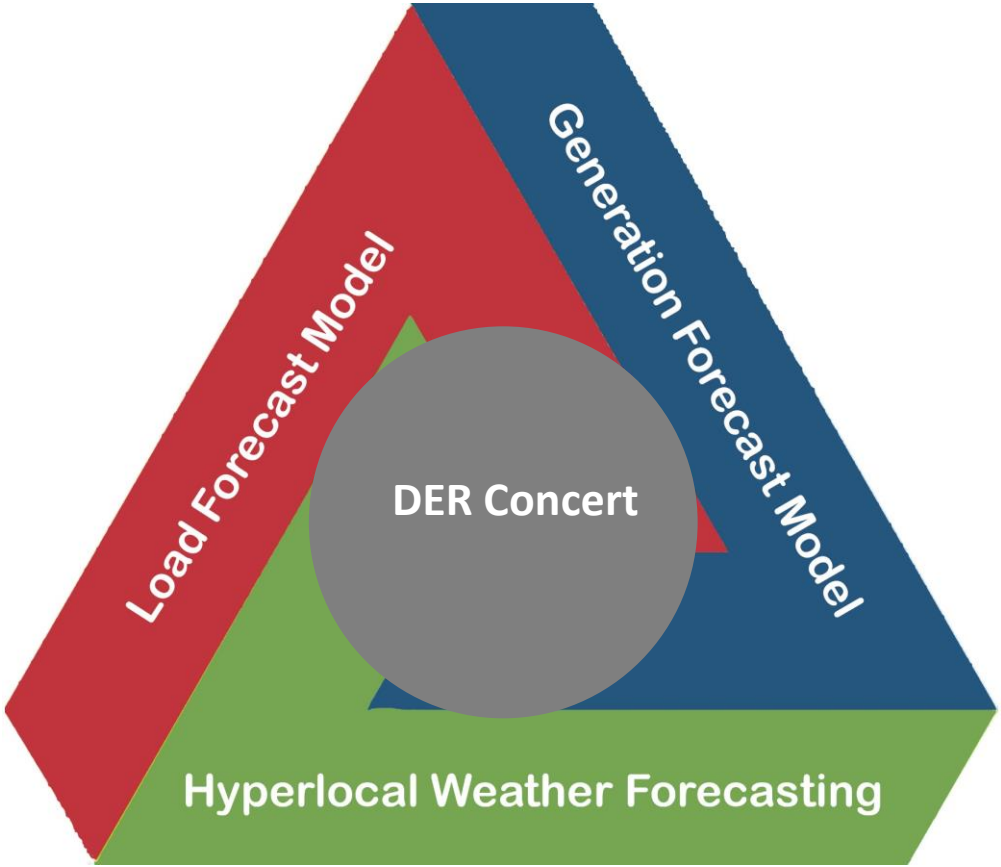
A powerful weather, energy data and analytics platform built that utilizes four coupled models and leading-edge analytics to deliver the most precise and accurate wind and solar generation forecasts in the world. VWAC enables us to:

Increase grid reliability, community resiliency

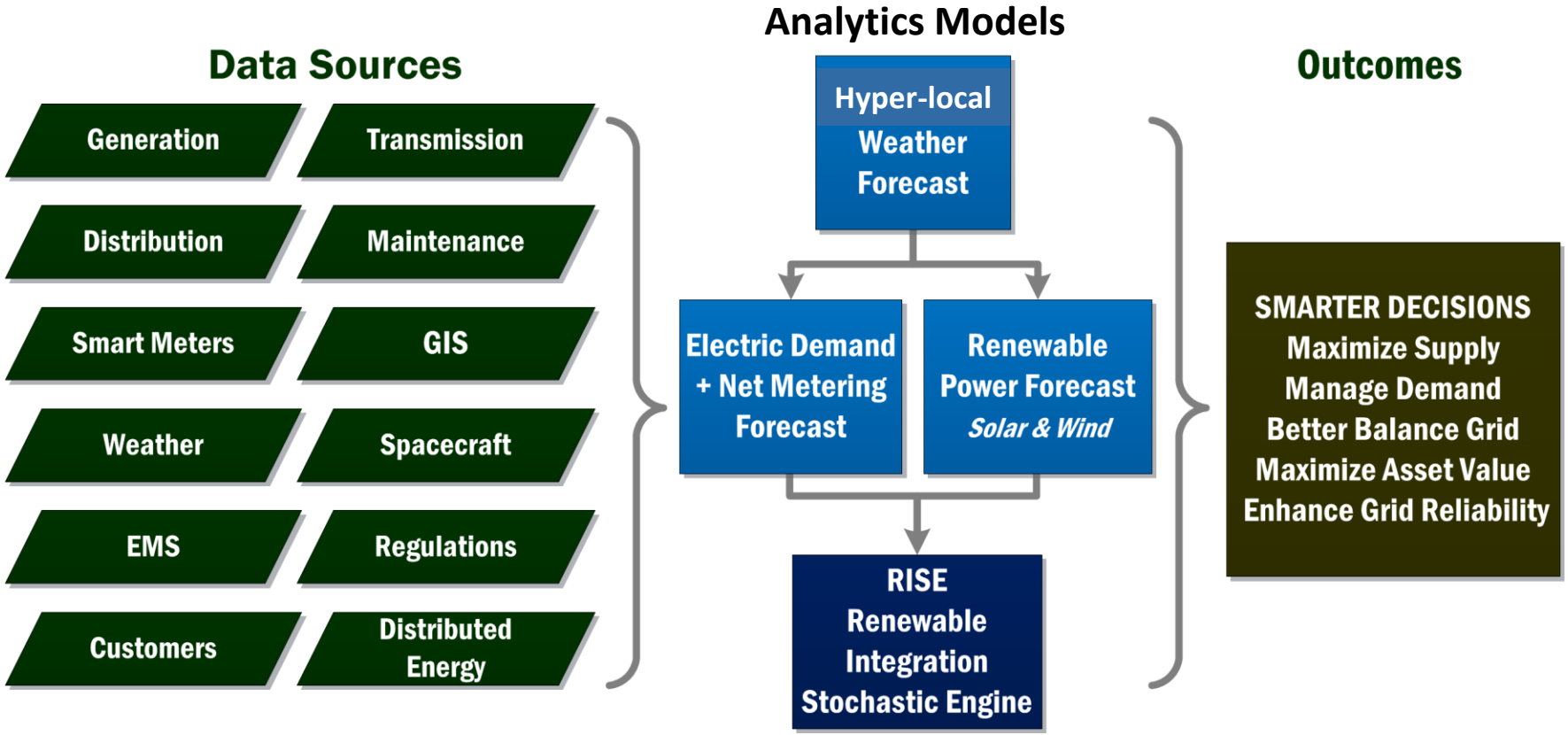
Lower weather event-related operational costs

Garner full value from renewable generation

DER Concert: Vermont's integrated grid



Need of the day: “a new intelligence”



Demonstrated Benefits

Safety & Reliability

More informed emergency response

Road condition updates

Geographically targeted customer updates

Operations

Improved outage scheduling

Ability to determine grid capacity for additional solar on the transmission system down to substation level

Demand analysis capability to substation level

Planning

Increased reliability of planning assessments due to AMI data integration

Improved non-transmission alternative development

Demand Management

Greater visibility to potential demand response events

Increased peak management capability

Efficiency measures validation

Transformative collaboration

vermont electric power company VELCO

IBM

Vermont Distribution Utilities

GREEN MOUNTAIN POWER

VERMONT ELECTRIC CO-OP INC

WEC Washington Electric CO-OP

BURLINGTON Electric DEPARTMENT

Stowe ELECTRIC

Vermont College/ University

LYNDON A vermont STATE COLLEGE

The University of Vermont

Other Vermont Organizations

VERMONT AGENCY OF TRANSPORTATION

VPPSA

VLITE Building an energy secure Vermont

Vermont Energy Investment Corporation

SKI VERMONT Winter in its Original State.

Stakeholder team

The Energy Systems Lab "TESL@UVM/VELCO" Weather/Grid project

- Design, develop and test algorithms and tools that improve transmission system operations and planning
- Visualize grid reliability with 20,50,90% renewable energy
- Quasi steady-state time series (QSTS) power flow analysis, with integrated contingency analysis –
  - Look-ahead optimization and constraint mitigation given knowledge about future load, wind, and solar to describe how network reliability will evolve
  - Quantifying the uncertainty associated with wind/solar
  - Wind/solar production time series datasets for testing
- **Planning not operational tools**

The University of Vermont

The Economist

MAY 6TH–12TH 2017

Crunch time in France

Ten years on: banking after the crisis

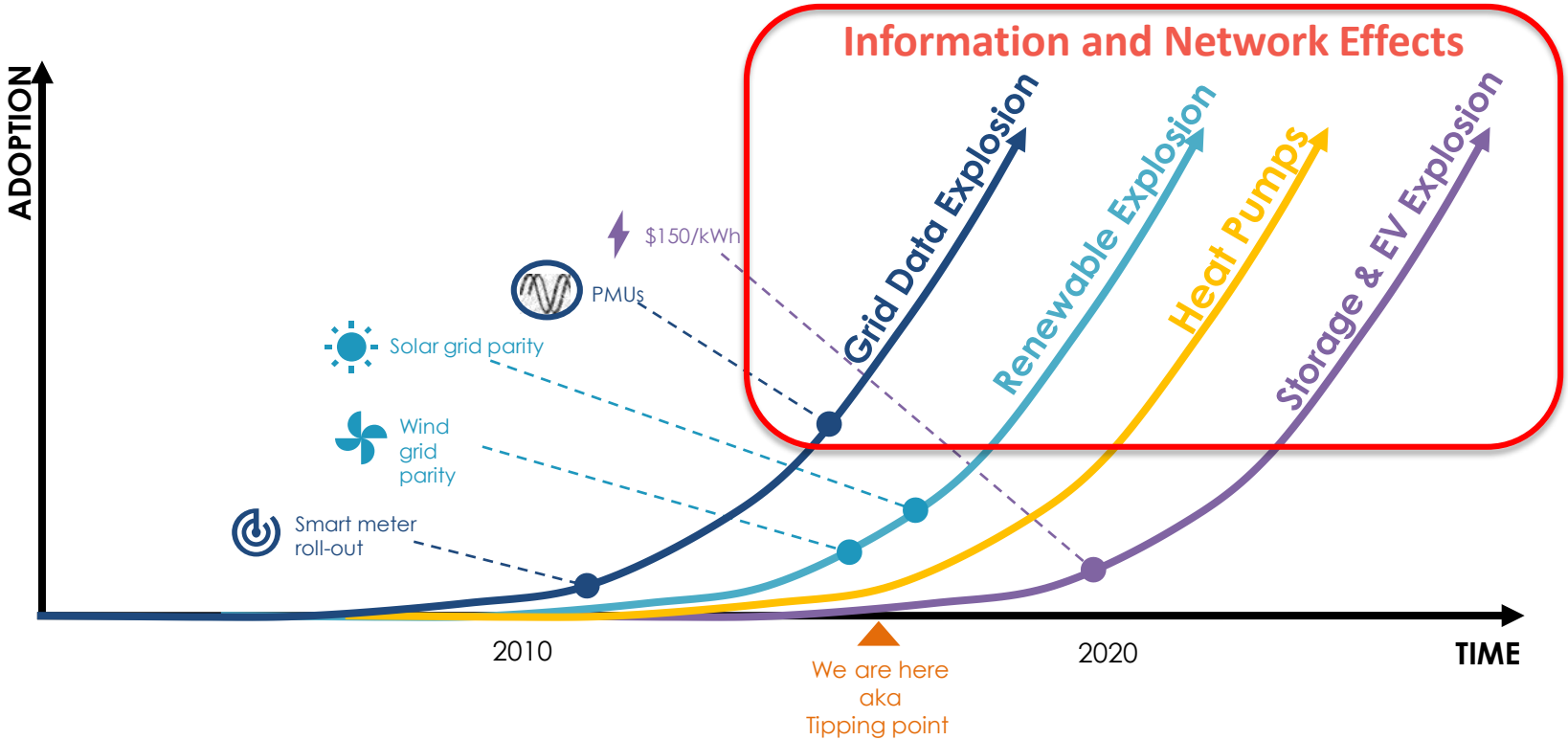
South Korea's unfinished revolution

Biology, but without the cells

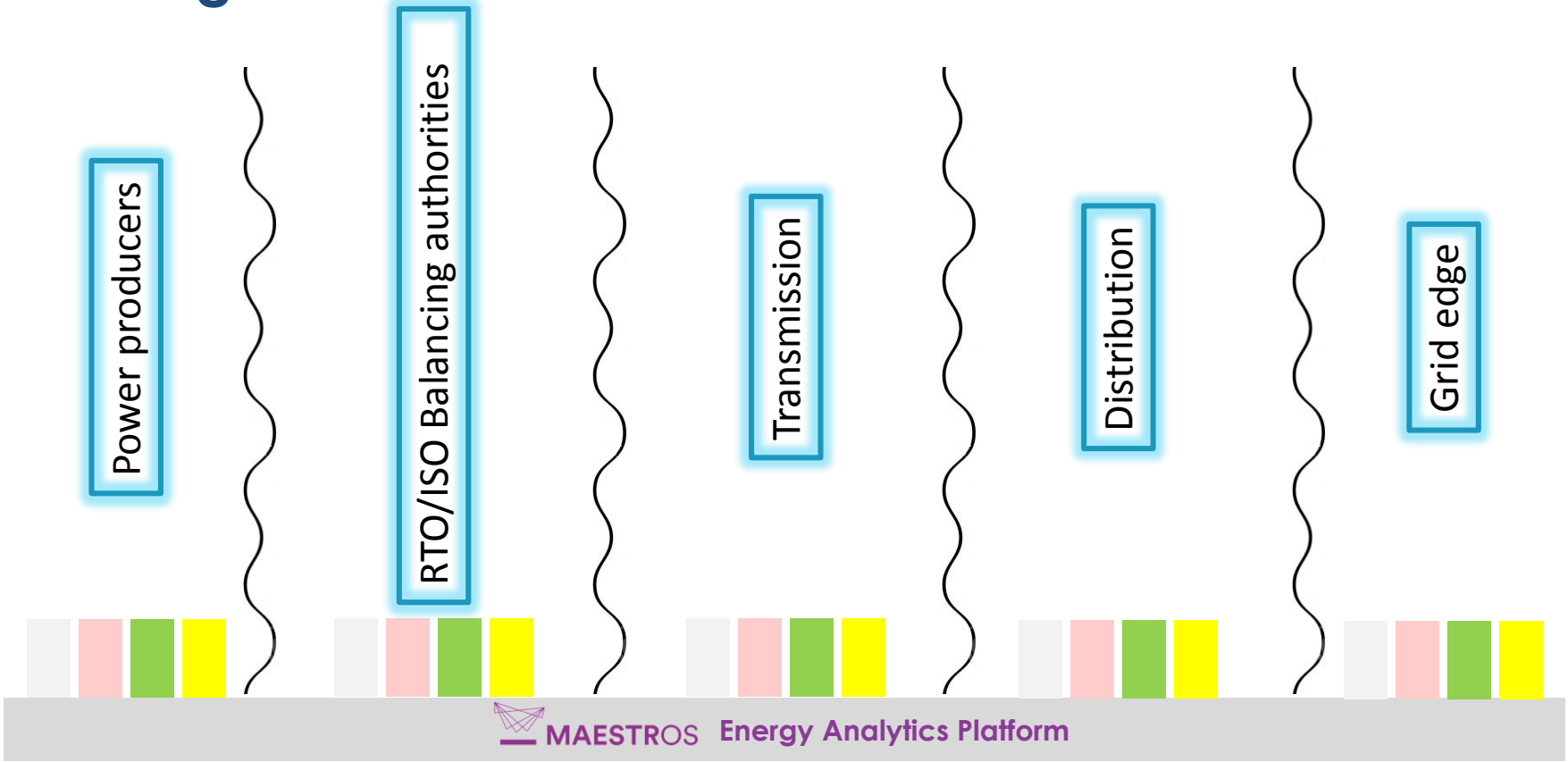
The world's most valuable resource

Data and the new rules of competition

Exponential and disruptive mega-trends



Blurring of boundaries



Grid harmony demands a new orchestration

	When Supply is Scarce or Constrained	When Supply is Abundant and Plentiful
	“Later”	“Run the dishwasher”
	Discharge	Charge the battery
	Delay or vehicle-to-grid	Charge the EV
	Turn on expensive power	Curtail expensive power
	Post-heat, post-cool	Pre-heat, pre-cool

DER = “Distributed Energy Resources” or “Digital Energy Revolution”

Utopus Insights: *Orchestrating the future of energy, today.*

World-Class Team

- Headquartered in NY, offices in India and Hungary
- Extensive expertise in power engineering and utilities
- Deep analytics, data science, digital transformation, IoT, meteorology

Validated IP & Products

- 15 years of solution development with over 20 leading energy companies
- 30 issued, 60 pending patents
- Analytics platform, asset analytics, DER integration

Active Clients

- Commercial contracts
- Joint Development Agreements to develop cutting-edge tools
- Global pilots with promising results

Strategic Partner

vermont electric power company
VELCO

Industry Expertise

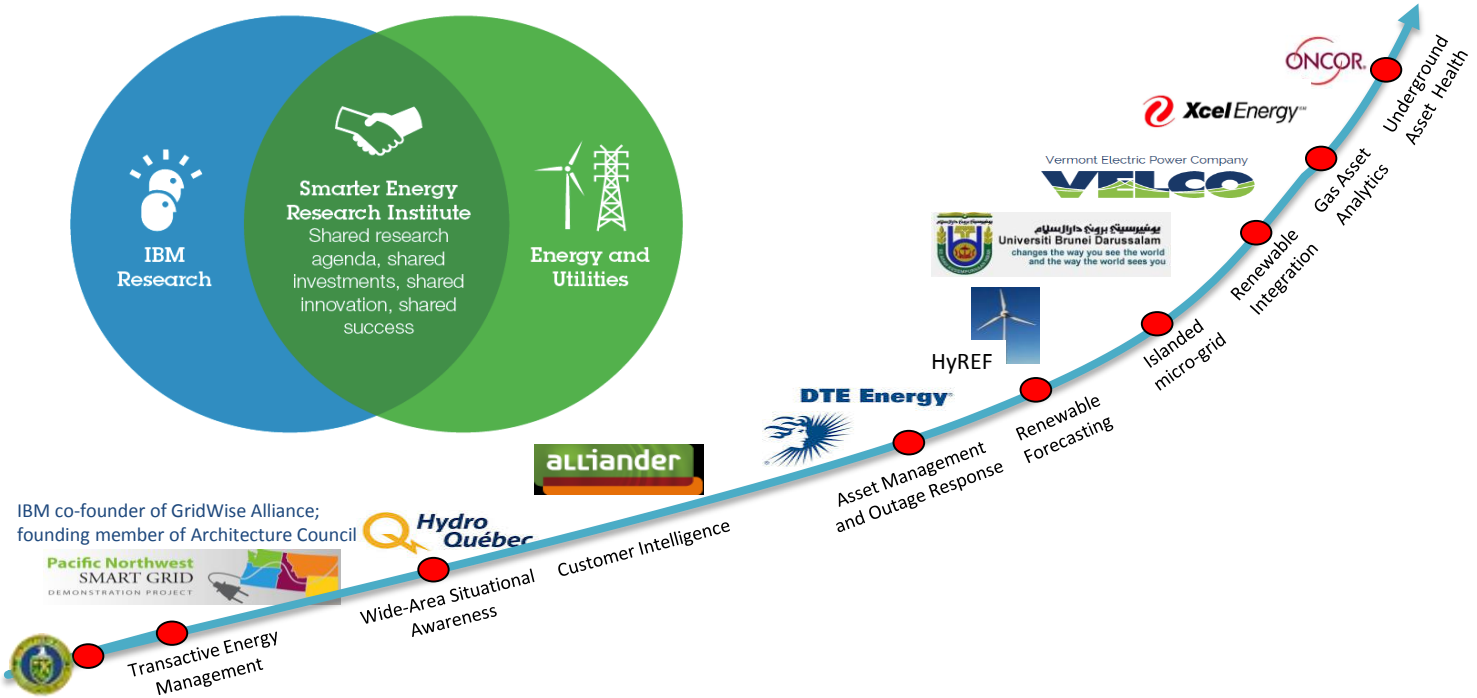
- Cumulative 500+ years in E&U Digitization and IoT, 75+ years of renewables domain expertise
- EEI 2016 finalist, DOE and PNW projects, GWAC founding member, Vermont REV award

Original Investors

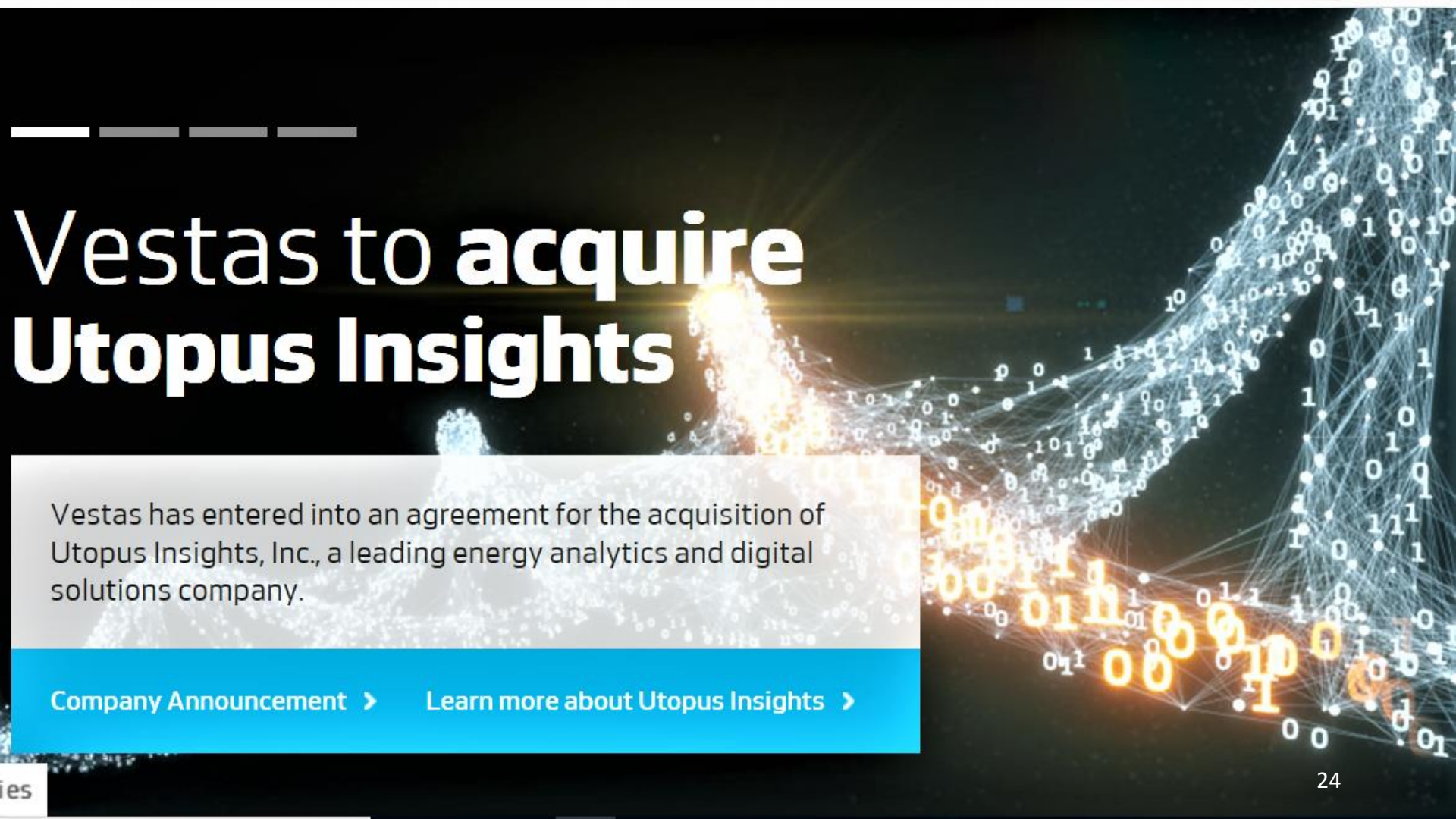
IBM BCG

vermont electric power company
VELCO

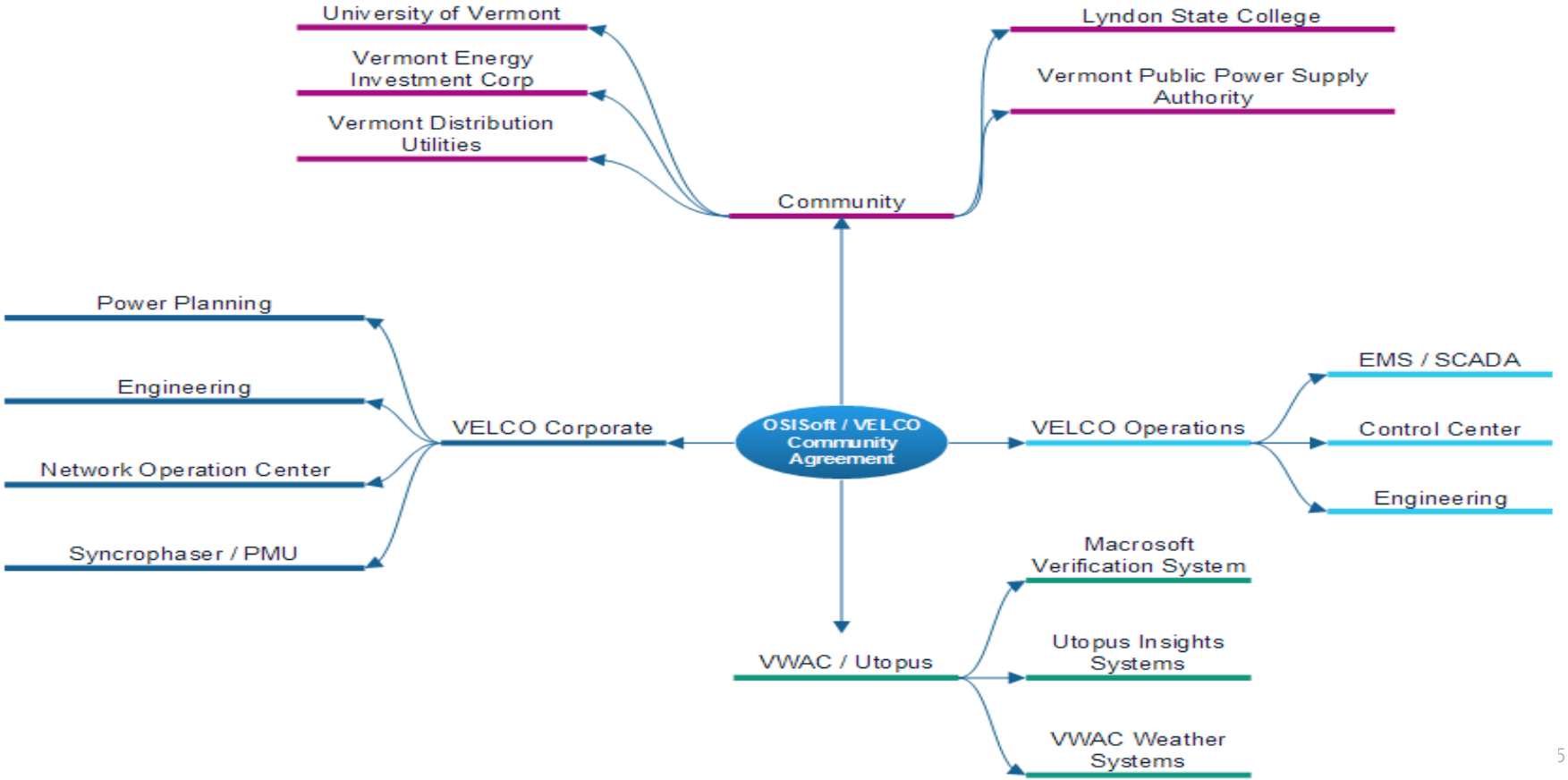
Our lineage



Proven record of co-creating solutions to solve utility pain points


Vestas to acquire Utopus Insights
Vestas has entered into an agreement for the acquisition of Utopus Insights, Inc., a leading energy analytics and digital solutions company.
Company Announcement ›
Learn more about Utopus Insights ›

OSISoft Community Agreement
Chart of Community Endpoints and Data Source / Destination Nodes



Six-part harmony

- Problem – brings focus
- Assets – creates options
- Evangelist – bring the verve
- Outsider – different skills, different perspective
- B-state Vision – uniting the whole
- Results – Success secures engagement


UTOPUS
INSIGHTS
Thank you!
Kerrick Johnson
Kerrick@utopusinsights.com

Merci

谢谢

Danke

Спасибо

Gracias

Thank You

감사합니다

ありがとう

Grazie

Obrigado

Optional: Click to add a takeaway you wish the audience to leave with.

Questions

Please wait for the **microphone** before asking your questions

State your **name & company**