Run and Grow the Business: Drivers and Technology Enablers

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Executive Briefing

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Zagreb, Croatia

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Trends Forcing Utility Companies to Focus on Run and Grow the Business

Run and Grow Business Drivers

- Financial Crisis
- Market Restructuring and Deregulation
- Market Consolidation
- Aging Asset
- Aging Workforce

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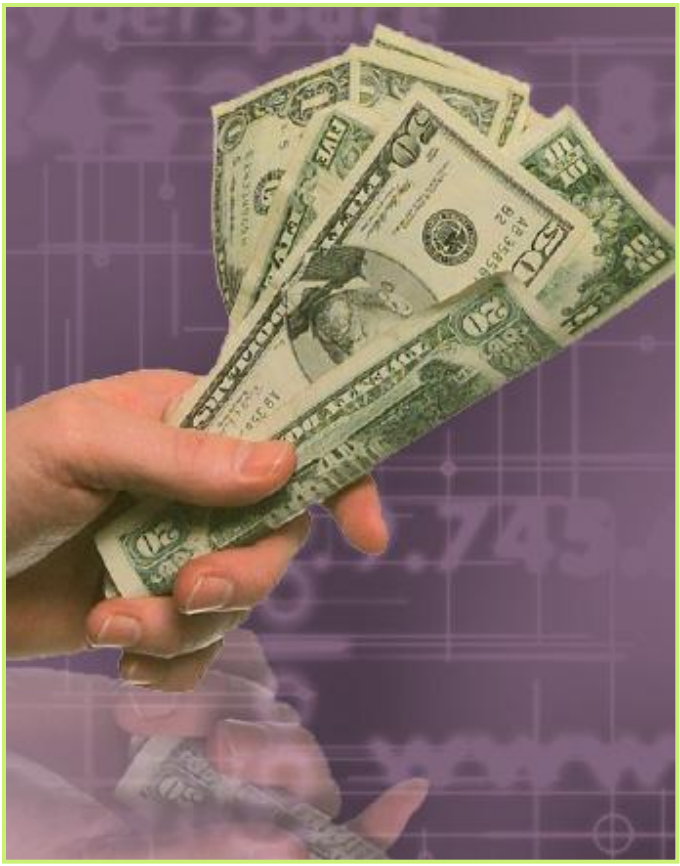
Financial Crisis impact on Utilities

- Access to capital for new investment
  - cost cutting, do more with less
- Some win (stimulus packages)
- Some lose (energy trading exposure, C+I dependence, borrowings)
- Some are neutral (continued rate protection and residential customer base)



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Market Restructuring and Deregulation

- Europe
  - Continental consistency
  - Integration of markets
- Asia Pacific
  - Privatization matures
  - Liberalization takes root
- North America
  - Continued inconsistency
  - Focus on wholesale, but large C&I consumers demand options
- Energy market normalization will emerge longer term

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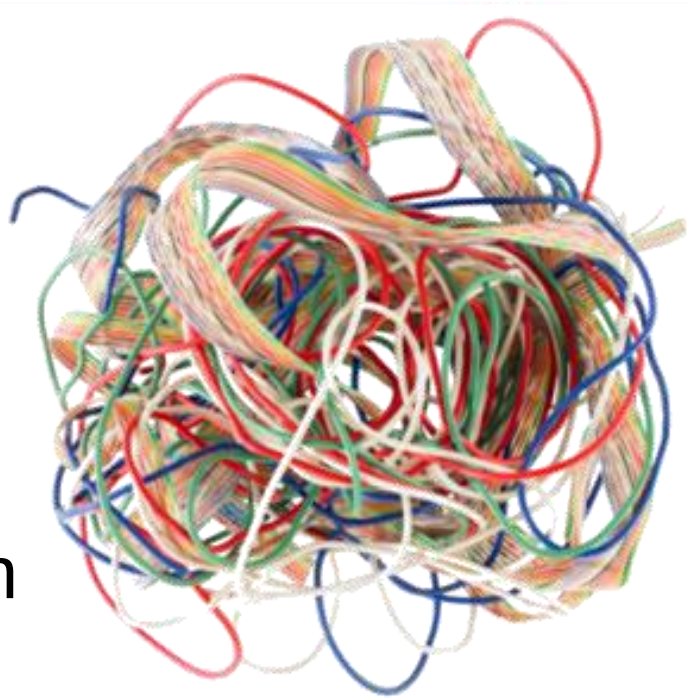
Mergers Acquisitions and Joint Ventures

- Merchant consolidation
  - Get bigger, achieve scale, pick low hanging fruit
  - Drive out costs
  - Build a full portfolio of assets
- Regulators are playing significant role in M&A approval
- In IT M&A benefits realization will depend on successful infrastructure consolidation, apps harmonization and sourcing



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Assets Are Aging

- Lack of clear "pricing" signals results in transmission asset investment deferral
- Because of the growth booms before the 1970s, many utilities are operating utility assets nearly at, or beyond, their designed useful lives

Maintain …

OR

… Fail

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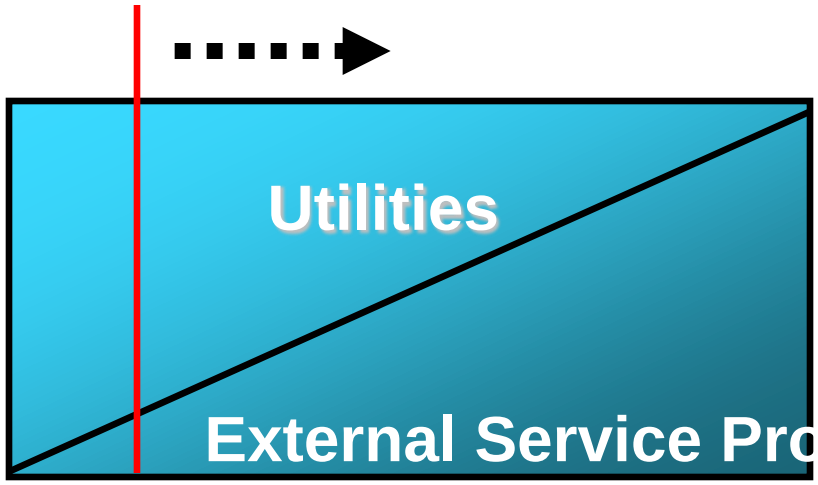
Workforce is Aging

- *Baby Boomers* retiring
  - Business continuity issue
  - The challenge of talent loss
  - Knowledge management
- IT Implications:
  - In house developed legacy applications face support issues
  - Outsourcing

Staffing Mix Is Changing



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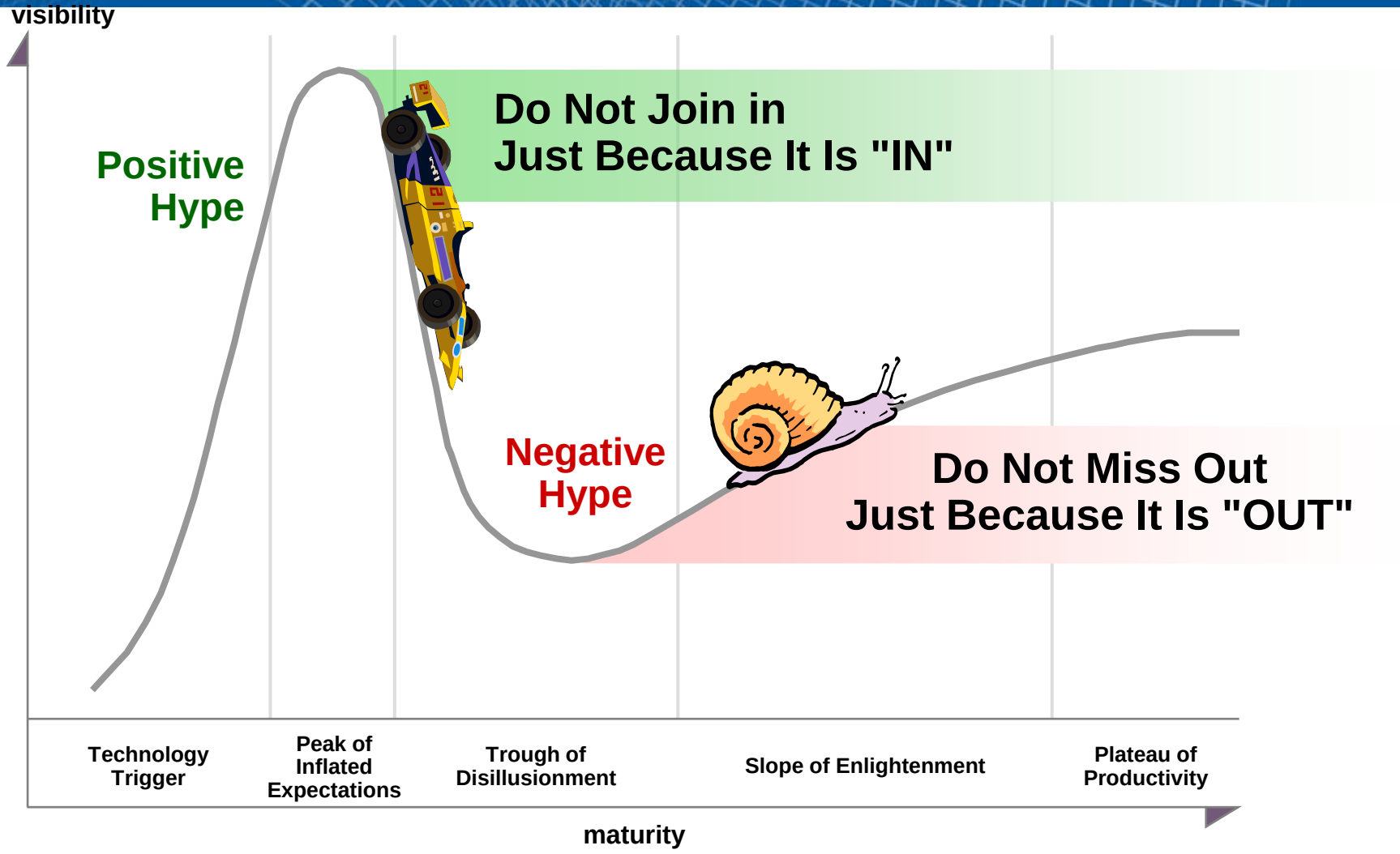
Energy and Utility Hype Cycles

Main Interpretation of the Hype Cycle



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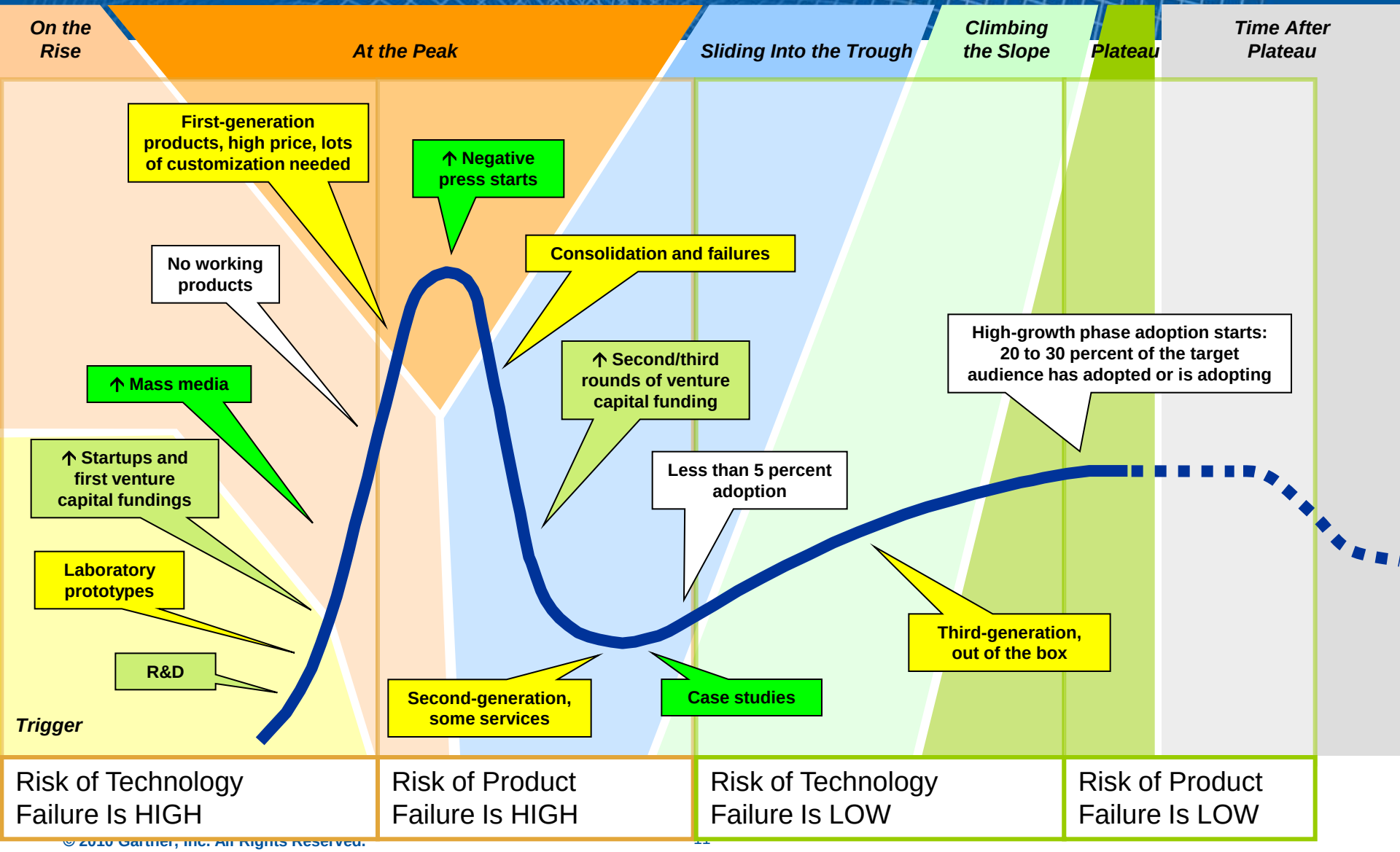
Some Hype Cycle Forensics



Hype Cycle for Utilities IT Applications and Business Processes

Types of Energy Utility Companies

1. Integrated Utility Company
   - Generation, Transmission, Distribution and Retail Function
     - Example: AEP, EDF, Exelon
2. Local Distribution Company (LDC)
   - Integrated Distribution and Retail Function
     - Example: Puget Sound Energy
3. Network Company (Energy Delivery)
   - Distribution (& Transmission) Function
     - Example: TXU Electric Delivery, National Grid UK, Powerlink, Alliander
4. Competitive Energy Retailer
   - Retail Function
     - Example: Entergy Solutions, Centrica, Nuon, Yello Strom
5. Independent System Operator (Transmission System Operator)
   - Transmission Function
     - Example: NY/NE ISO, PJM
6. Merchant Generator
   - Generation Function
     - Example: Calpine, Entergy Nuclear, RWE Innogy

Key Applications Across the Energy Utility Industry

Generation	Energy Supply	Delivery	Customer Service	Shared Services
▪ Process Control/ Performance Monitoring ▪ Optimization ▪ Work & Asset Management ▪ Document Management ▪ Fuel Management	▪ ETRM ▪ Meter Data Management ▪ Load Forecasting ▪ Demand Response	▪ EMS/SCADA ▪ Work & Asset Management ▪ EAM ▪ Outage Management Systems ▪ Field Force Enablement (mobility) ▪ Geographic Information Systems ▪ Network Design ▪ AMR	▪ CIS ▪ CRM ▪ Complex Billing ▪ Call Centers	▪ ERP ▪ Supply Chain ▪ Enterprise Risk ▪ (IT Tools)

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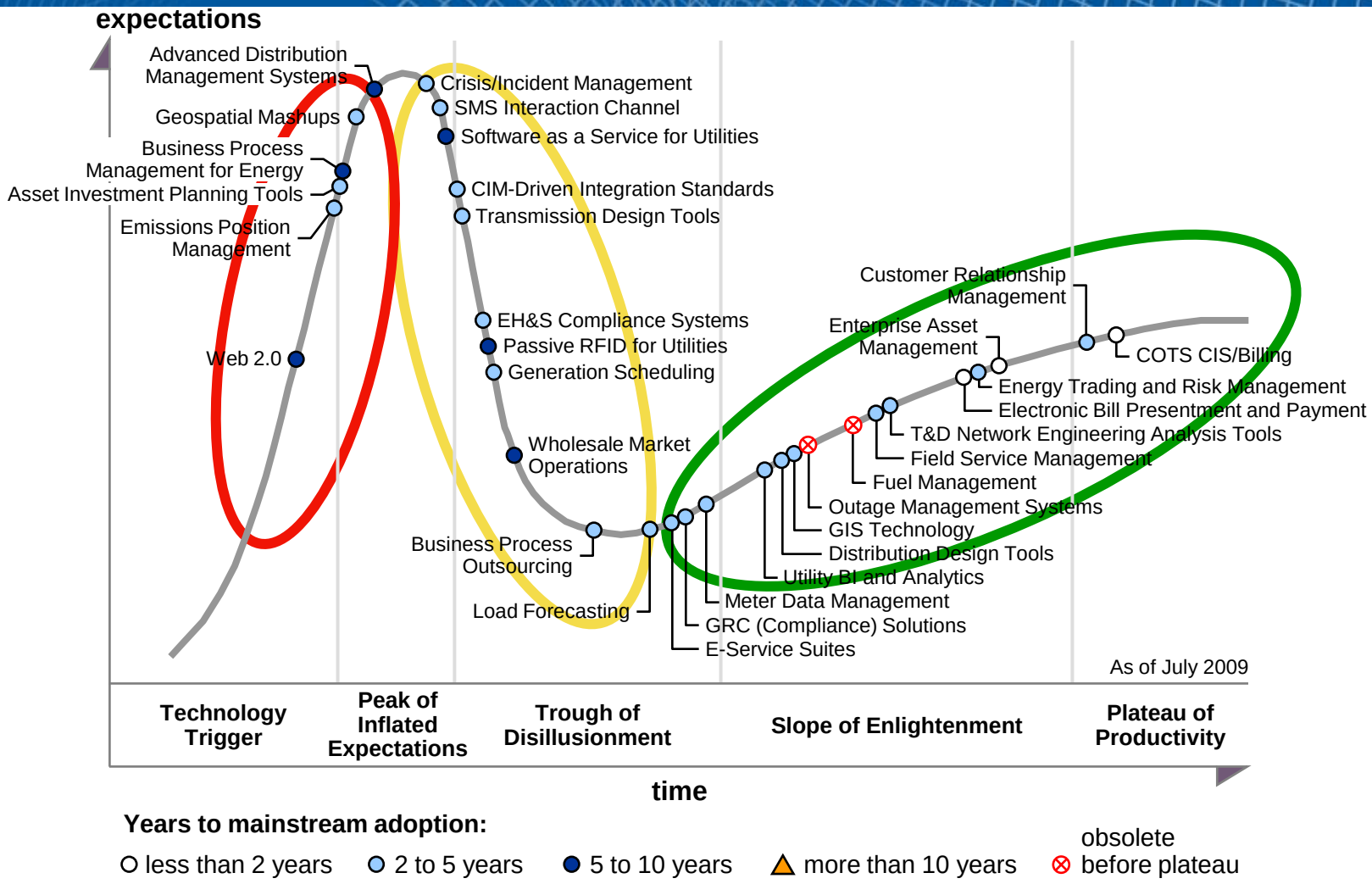
Hype Cycle for Utility Industry IT Applications and Business Processes, 2009



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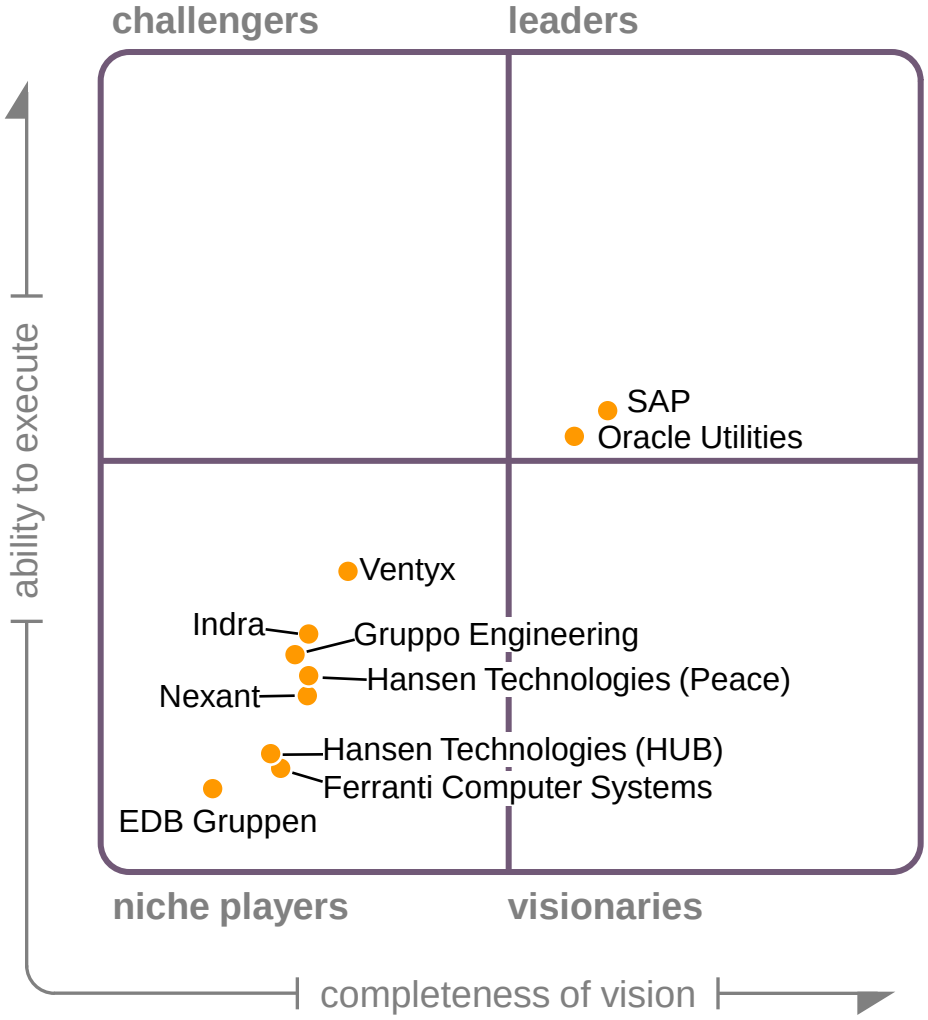
Priority Matrix: What's Coming, When and How Hard Will It Hit?

benefit	years to mainstream adoption			
	less than 2 years	2 to 5 years	5 to 10 years	>10 years
transformational			Wholesale Market Operations	
high	COTS CIS/Billing	Business Process Outsourcing Crisis/Incident Management Customer Relationship Management Energy Trading and Risk Management E-Service Suites Field Service Management Generation Scheduling Geospatial Mashups Load Forecasting Meter Data Management	Advanced Distribution Management Systems Business Process Management for Energy Web 2.0	
moderate	Electronic Bill Presentment and Payment Enterprise Asset Management	Asset Investment Planning Tools CIM-Driven Integration Standards Distribution Design Tools EH&S Compliance Systems Emissions Position Management GIS Technology SMS Interaction Channel T&D Network Engineering Analysis Tools Transmission Design Tools Utility BI and Analytics	Passive RFID for Utilities Software as a Service for Utilities	
low		GRC (Compliance) Solutions		

As of July 2009

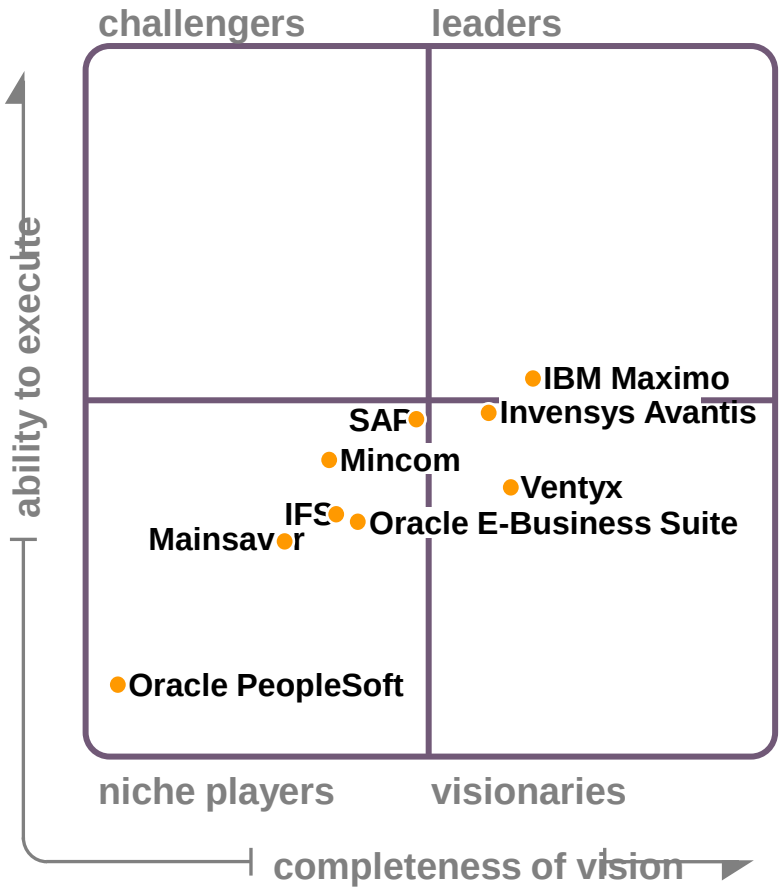
Magic Quadrant Analysis
Innovation and Viability Pulls Leaders Apart



As of June 2009

(From "Magic Quadrant for Utilities Customer Information Systems", ID G00168517 2009)

Utility EAM Magic Quadrant



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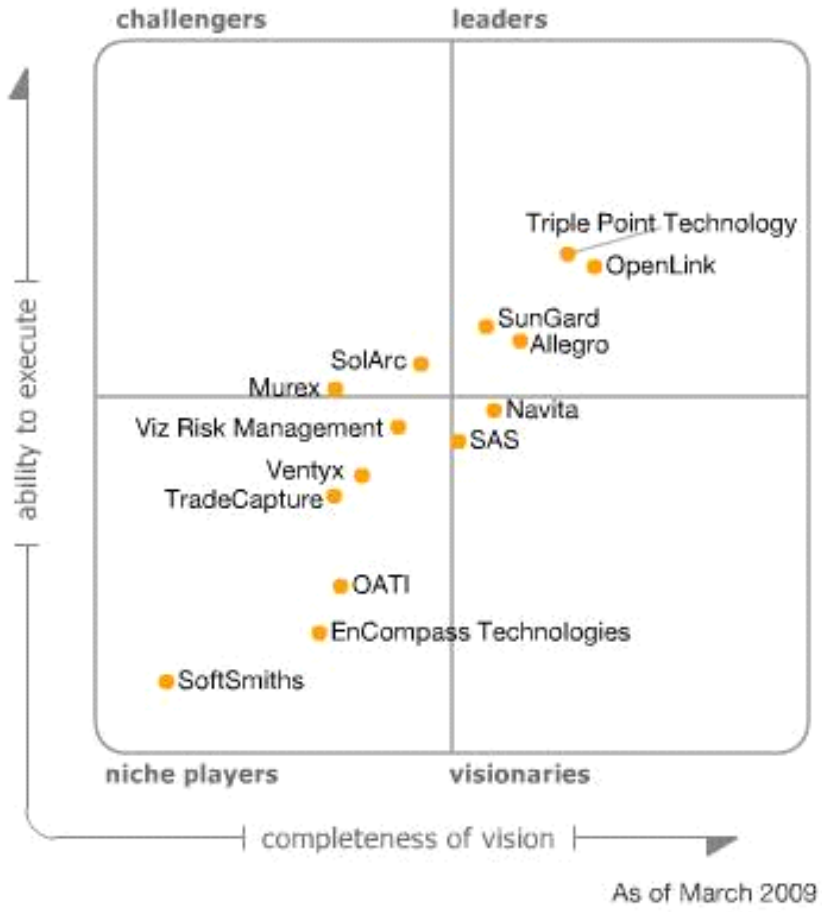
ETRM Magic Quadrant



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Hype Cycle for Utilities Operational and Energy Technologies

“… IT is only h
and half the be
Operational Te
integration …”

What Is the Operational Technology?

	Information Technology	Operational Technology
Purpose	Managing information, automate business processes	Managing integrity of the plant asset and control technical processes
Architecture	Monolithic, Transactional or batch, RDBMS or text	Event-driven, real-time, embedded software, rule based engines
Interfaces	GUI, Web browser, terminal and keyboard	Electro-mechanical, sensors, coded displays
Ownership	CIO and computer grads, finance and Admin. Depts.	Engineers, technicians and LOB managers
Connectivity	Corporate network, IP-based	Control networks, hardwired
Examples	HR, finance, accounting, e-mail, EAM, billing	SCADA, PLCs, modeling, control systems

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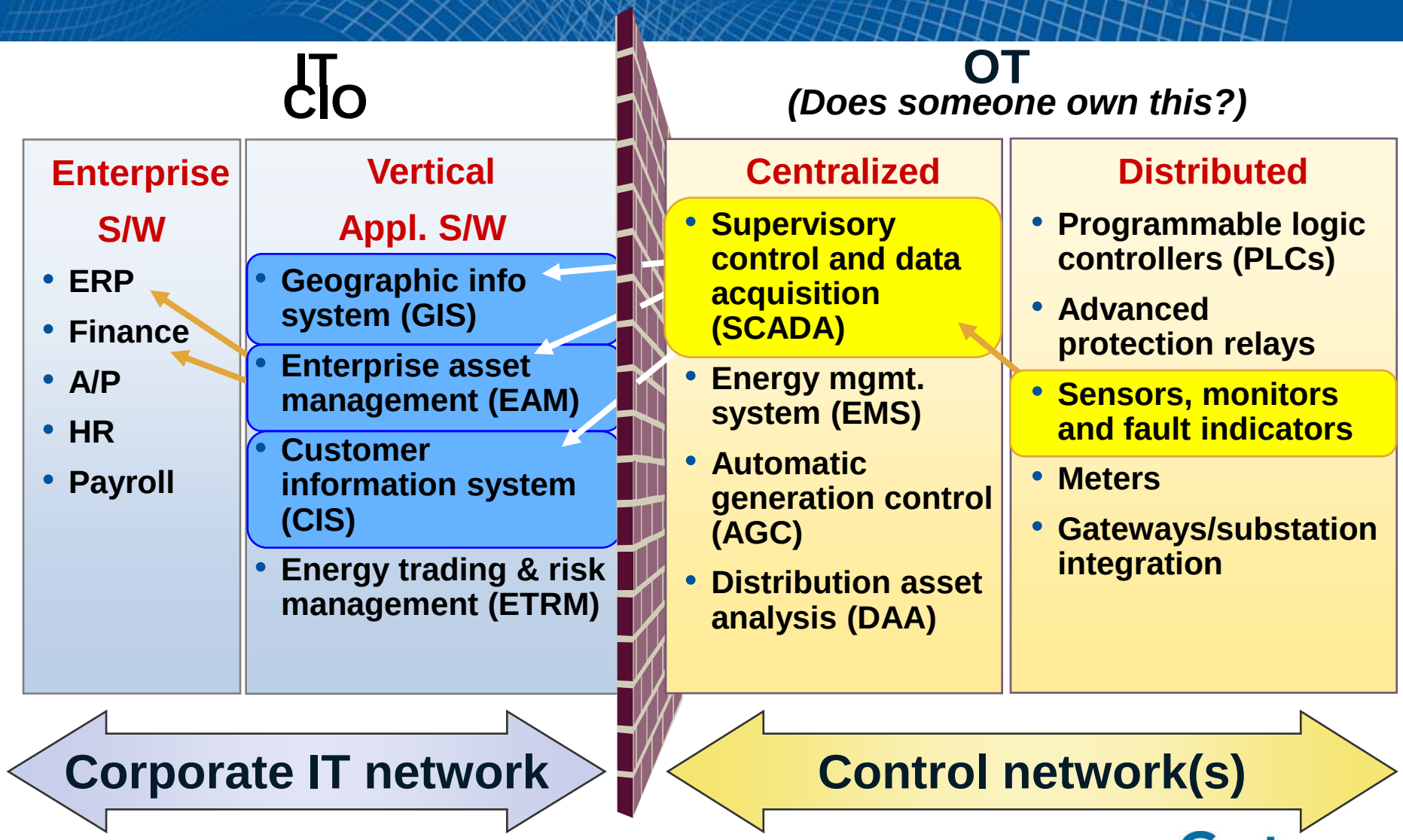
Different Technologies — Value Comes From Integration



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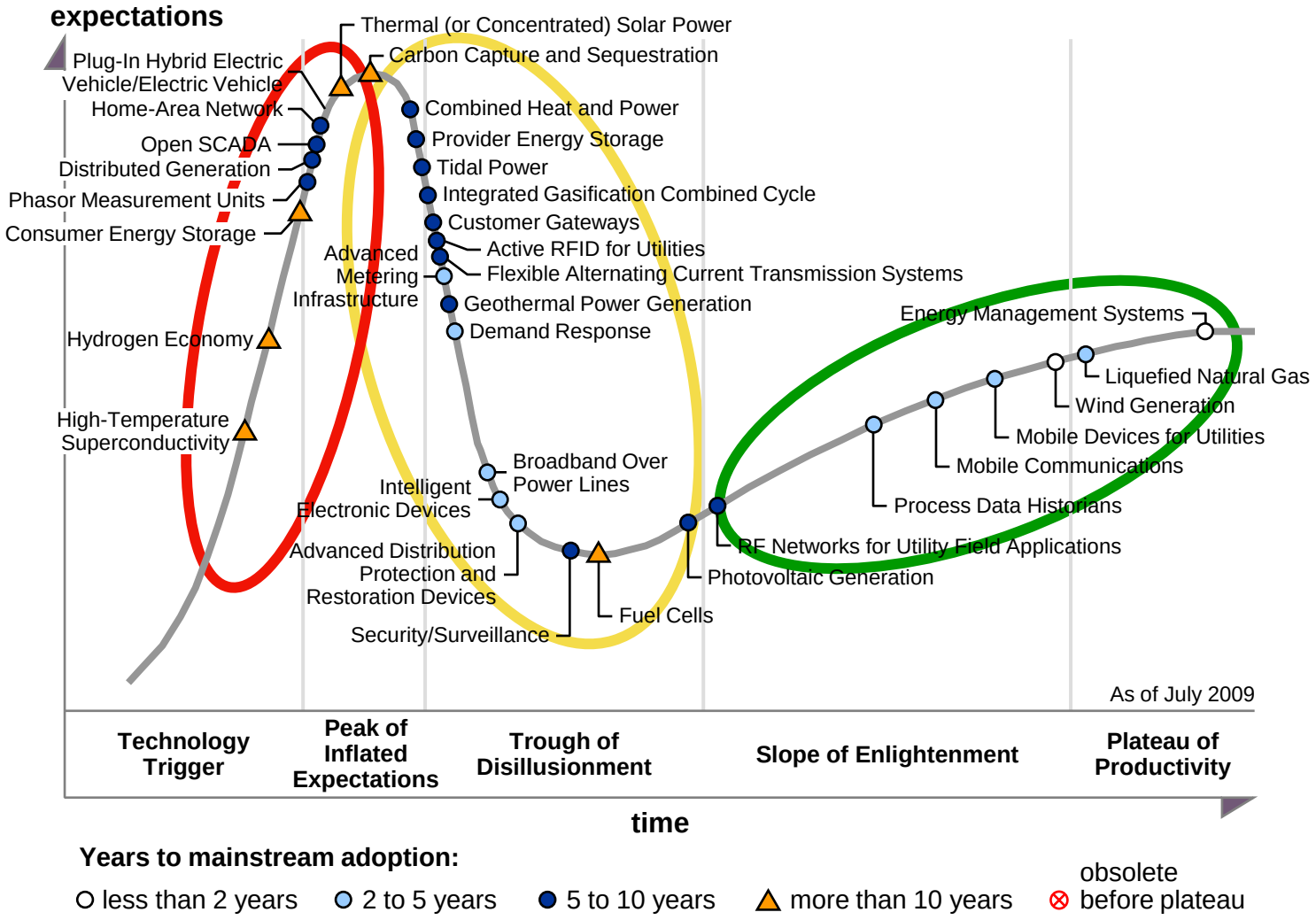

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Priority Matrix: What's Coming; When and How Hard Will It Hit?

benefit	years to mainstream adoption			
	less than 2 years	2 to 5 years	5 to 10 years	more than 10 years
transformational		Advanced Metering Infrastructure Demand Response	Distributed Generation	Carbon Capture and Sequestration Hydrogen Economy
high	Wind Generation	Liquefied Natural Gas Mobile Communications Mobile Devices for Utilities	Combined Heat and Power Customer Gateways Flexible Alternating Current Transmission Systems Home-Area Network Integrated Gasification Combined Cycle Phasor Measurement Units Plug-In Hybrid Electric Vehicle/Electric Vehicle Provider Energy Storage	Consumer Energy Storage Thermal (or Concentrated) Solar Power
moderate	Energy Management Systems	Advanced Distribution Protection and Restoration Devices Broadband Over Power Lines Intelligent Electronic Devices Process Data Historians	Active RFID for Utilities Geothermal Power Generation Open SCADA Photovoltaic Generation RF Networks for Utility Field Applications Security/Surveillance	Fuel Cells High-Temperature Superconductivity
low			Tidal Power	

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Mobile Technologies Drive Energy and Utility Performance

- Optimize and track crew work schedule and routing (increased wrench time)
- Transferring field information (inspection, maintenance, construction red lines) using mobile devices is more efficient and less error-prone than clerks transcribing from paper
- Enables real-time workforce, asset condition assessment (e.g., storms and major events), and inventory optimization
- Reduces potential fines/lost revenue from SLA/regulatory/customer dissatisfaction
- Drive greater value from IT systems by improving enterprise information management (data quality)






Operational performance is enhanced by integrating device-enabled field forces with the IT enterprise

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Recommendations

- ✓ Focus on the IT applications, operational and energy technologies that have relevance to your enterprise/strategy
- ✓ Institute a "technology watch/alert" to capture the potential benefits of an emerging technology or catch an early warning sign of a "tsunami"
- ✓ Before investing, check the Hype Cycle position and act according to your technology adoption risk tolerance
- ✓ Determine the optimal time to invest seriously in a technology
- ✓ Identify technologies that may have longer-term strategic value, and start monitoring now
- ✓ Monitor vendor product plans with respect to relevant technologies

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