Are these headlines alarmist or “in-the-money”?

Wellinghoff: Utilities must adapt or die

Feature Article
Businessweek declares death of the grid
Aug 29, 2013  Talk Back  Free Alerts  More On This Topic

International Association for Energy Economics
Why Demand Growth is Out, Energy Efficiency is in, and the Important Implications of the Two

As solar matures, industry pushed to consider meaning of grid citizenship

40 Percent of Utilities Predict ‘Complete Transformation’ by 2030

Can the world wait that long for the utility of the future?
Katherine Tweed
October 0, 2013

Distributed Resources and Utility Business Models – The Chronicle of a Death Foretold?
Views on change

“When you see a disruptive technology come into your space, if you don’t embrace it... the people who try and cling to the past get rolled over.”

David Crane, CEO NRG

“Disruptive challenges ... are not currently being discussed by the investment community and factored into the valuation.”

Edison Electric Institute
Drivers + Trends = Fundamental questions

Drivers
- Unconventional gas and oil
- Centralized renewables
- Distributed generation
- Energy efficiency
- Customer interest

Trends
- Retail deregulation
- ROE downward trend
- Increasing system costs
- Big Data

How concerned should utilities be?
What should they do about it?
Where do utilities stand on these?

How concerned should utilities be?
- What is the threat to the business model?
- How real, impactful, and immediate is it?

Growing consensus “yes” threat to 4-6% EPS growth but expected timing differs

What should utilities do?
- Is there a viable defensive play (preserve loss)?
- Is there an offensive opportunity (generate growth)?

Huge variation spanning “disaster” to source of “renergizing the utility”

Glass is half empty...or half full?
In Europe, value is moving to renewables and downstream

European industry EBIT, EUR billions

- **Centralized renewables**: 13
- **T&D**: 25
- **Downstream**
  - 2011: 123
  - 2020E: 144

**Growth in traditional T&D**: 6

**Decline in merchant generation**: 16

**Centralized renewables**: 17

**Downstream**: 14

**2020E**: 28

**55**

1. Includes power sales and new downstream (distributed generation and storage, EV infrastructure, new downstream products and services, power flow optimization)
2. Includes smart grids

**SOURCE**: Industry vision McKinsey team analysis
In the US, macro trends will also re-shuffle value pools along the value chain.

So far utilities have had to adapt – not transform – but future is going require transformation.

**EBITDA today ($ Billion)**
- Generation: 18
- Wholesale/trading: 3
- Regulated utilities/ T&D: 105
- Retail: 5
- Services: 1

**Project CAGR 5 year (%)**
- Generation: 2%
- Wholesale/trading: 1%
- Regulated utilities/ T&D: 5%
- Retail: 8%
- Services: 14%

**SOURCE:** FERC, EIA Energy Velocity, EEI, McKinsey analysis
What does this future state imply?

- **Relocation of generation from HV to LV**

- **Customers become part of supply curve** (demand variability)

- **Grid management complexity increases**—data needs, physics, unpredictability (T and D lines blur)

- **Grid is increasingly a back-up machine** (storage will accelerate this)

- **Lumpy to modular shape of investments**

- **Proliferation of new products/services** (new value pools DG, EE, DR, MicroEMS, retail, EV, etc)
Guess who’s coming to eat dinner.....

Data/OT/IT
- IBM
- accenture
- Oracle

New grid technology
- Toshiba
- ABB
- Hitachi
- Siemens

DG players
- SunRun
- SunEdison

Retailers
- Just Energy
- Constellation
- Direct Energy

Integrators
- nrg
- GRIDPOINT

Demand management
- ENERNOC
- Johnson Controls
- Voltalis
- Honeywell

BEMS
- nest
- Schneider

Virtual managers
- vivint
- PARETO ENERGY

SOURCE: McKinsey Electric Power Practice
Current business model roles/capabilities

**Customer**
- Customer experience and back office

**Distribution**
- System investment and planning
- Field operations
- System operations
- Security

**Transmission**
- System investment and planning
- Field operations
- System operations
- Security
### Emerging business model roles/capabilities

#### Customer
- Customer experience and back office
- Utility interface
- On premises products and services
- Multi-premise management
- Advanced security

#### Distribution
- System investment and planning
- Field operations
- System operations
- Intermittency planning and balancing
- Advanced security (OT/IT)

#### Transmission
- System investment and planning
- Field operations
- System operations
- Coordinated balancing

*SOURCE: McKinsey Energy Practice*