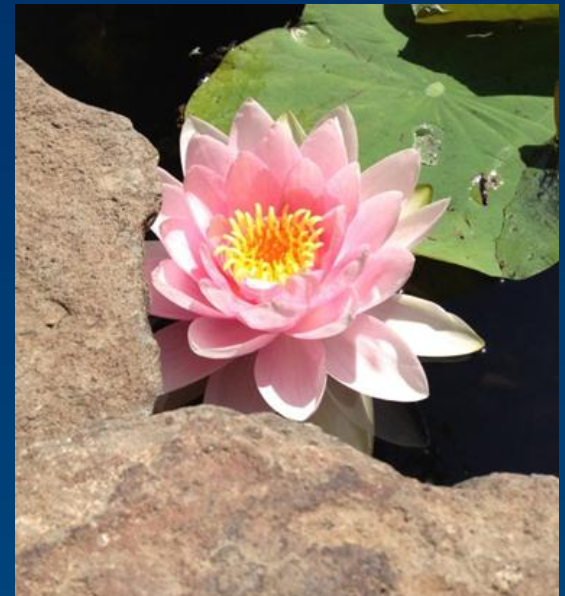


Surviving Sub-One Percent Sales Growth

EISPC Annual Meeting
Naples, Florida

Ahmad Faruqui , Ph.D.

March 13, 2014



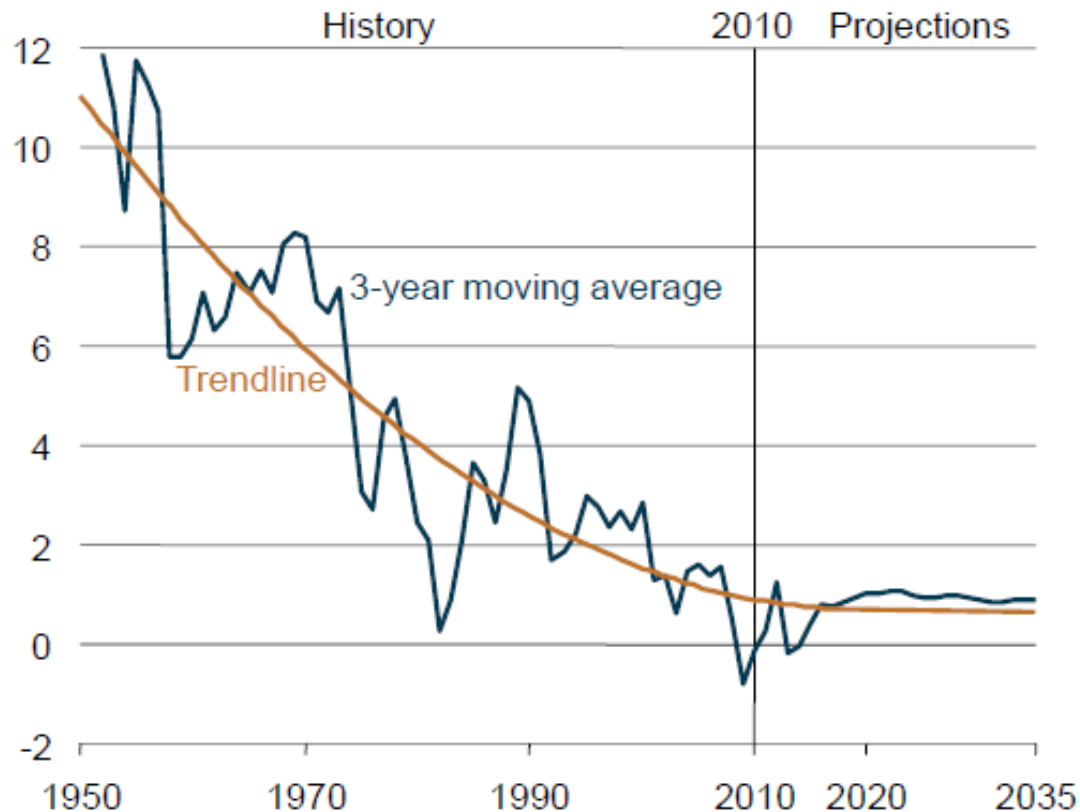
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Normal electricity growth has not resumed four years after the Great Recession ended

- According to Dr. John Caldwell of the Edison Electric Institute, normal growth usually resumes within five months after the recession ends; the longest it has ever taken has been twelve months
- The EIA's March 2013 Short-Term Energy Outlook (STEO) projects that electric retail sales will grow by ~0.7% in 2013 and 2014; in the residential sector, the corresponding growth rates will be ~0.3% and ~0.8%
- The EIA also projects that total electricity sales will not return to the weather-adjusted pre-recession levels until 2014

Of course, declining growth has been the norm and not the exception since 1950

U.S. Electricity Demand Growth, 1950-2035 (percent, 3-year moving average)



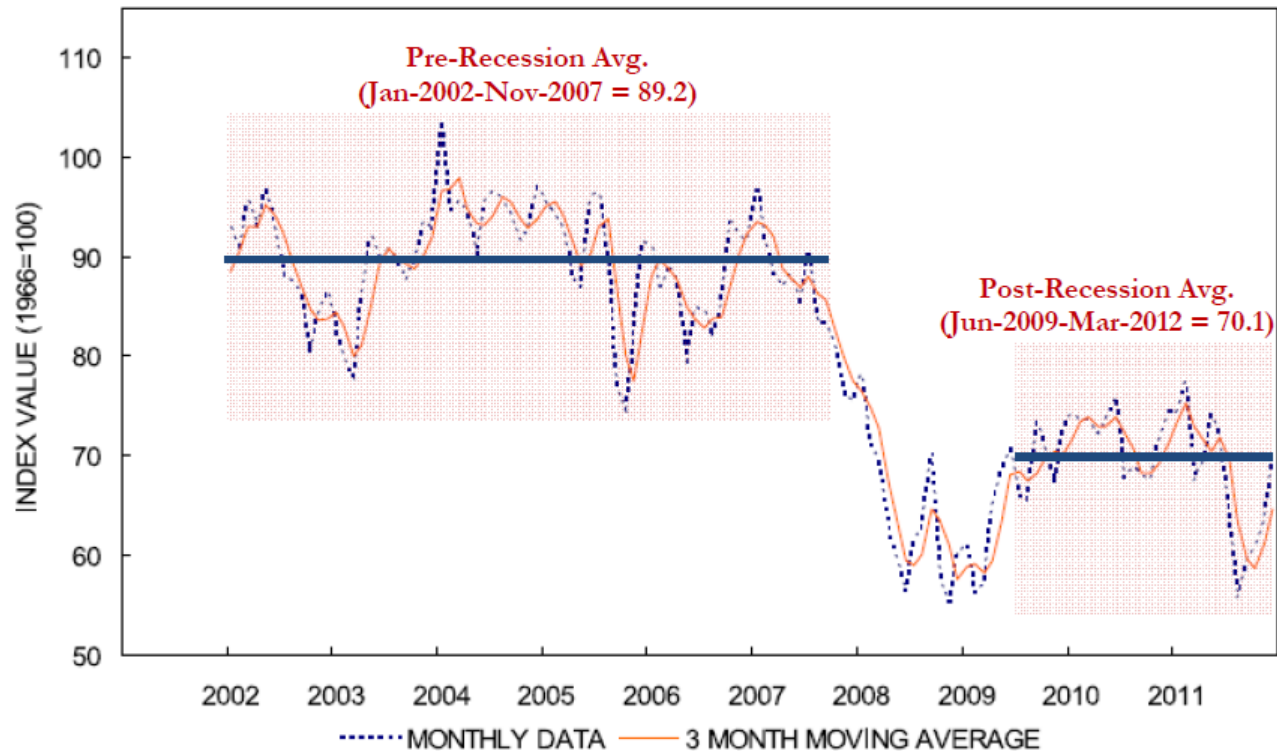
Source: EIA, 2012 Annual Energy Outlook

Three new forces have shaped the recent drop in growth

- First, consumer psychology has shifted as a new generation of consumers has arrived with new values and norms; new technologies are pushing them to explore the frontiers of energy efficiency on their own; and they are into belt-tightening, faced with continued economic uncertainty
- Second, utilities are stepping up their spending on energy efficiency programs, often prompted by energy efficiency standards and new legislation
- Third, states and federal governments are continuing to push ahead with aggressive enhancements to codes and standards

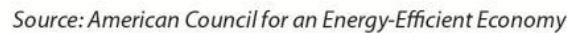
Consumer confidence continues to be a drag on consumer spending

Index of Consumer Sentiment – Recent Changes



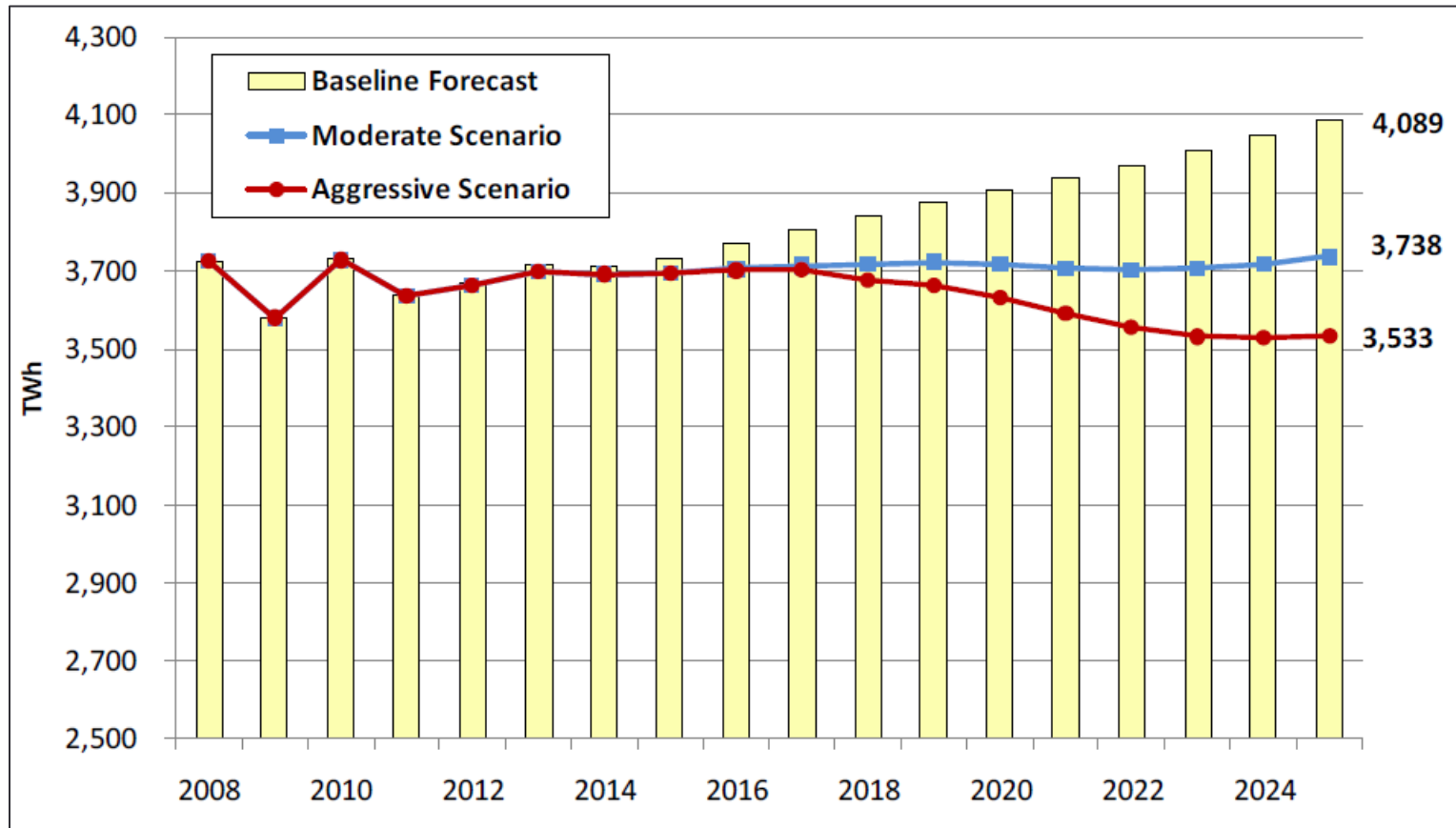
Source: University of Michigan [Survey of Consumers](#)

Note: Sentiment index for March 2013 increased to 78.6 from 77.6 a month earlier but fell again in April 2013 by several points



New codes and standards could dramatically decrease baseline energy consumption

Impact of Codes and Standards on Total U.S. Electricity Consumption (TWh)



Source: IEE, Assessment of Electricity Savings Achievable through New Appliance/Equipment Efficiency Standards and Building Efficiency Codes (2010-2025)

Two more forces have appeared on the horizon

- The fourth force is distributed generation, led by the revolution in roof-top solar and supplemented by micro turbines
- Roof-top solar is approaching grid parity, capitalizing on heavy upfront cash subsidies and spurred on by net metering tariffs that over-compensate solar customers
- The leasing model pioneered by SolarCity is being copied rapidly by others
- The fourth force alone can eliminate load growth

Net metering enables distributed generation to expand

- In 2003, there were less than 7,000 U.S. customers on net metering
- By 2010, there were 156,000 (roughly half in California)
- In 2010, that amounts to 0.1% of total U.S. electricity sales
- In California, the 5% cap is predicted to be reached by 2015

Source: Net Metering: A Worrisome Trend, The International Energy Newsletter, July 2012.

With distributed generation, net-zero energy homes become a reality

- In Austin, Texas, the Zero Energy Capable Homes program requires that new single-family homes be net-zero energy capable by 2015
- The largest community of net-zero homes in the U.S. is rising in West Village at UC Davis in California
- The California Energy Commission has called for all new residential construction to be zero net energy by 2020 and for all new commercial construction to be zero net energy by 2030

The fifth force is fuel switching

- The revolution in shale oil and gas is pushing fuel prices downwards
- The use of gas for commercial air conditioning and in industrial process is going to become economic, leading to significant inter-fuel substitution away from electricity in the commercial and industrial sector
- Gas-fired residential heat pumps may also begin making inroad into the home HVAC market

What are the options for electric utilities?

- To deal with the five forces, we discuss four strategies and three tactics
- While strategies are important, it is equally important not to overlook tactics
- Recall the adage – “Amateurs discuss strategy; experts discuss tactics.”

First strategy – stay the course

- The assumption is that growth will resume by itself; declining energy prices will herald an industrial revival and boost electricity sales
- CERA's Larry Makovitch has put forward a provocative argument along these lines
 - http://www.powermag.com/issues/features/Expect-U-S-Electricity-Consumption-to-Increase_5634.html
- This is a very high risk strategy, as noted on the next slide

All industries ignore the changing world at their own peril

“The car as we know it, and how it’s used in people’s lives, is going to change really dramatically and it’s going to change fast. If we don’t start imagining this future, and then start trying to help shape this future, we’re going to be left behind, because this future is going to happen with or without us.”

Bill Ford, Executive Chairman, Ford Motor Company

<http://www.chicagotribune.com/business/la-fi-hy-autos-bill-ford-milken-talk-20130501,0,3825298.story>

Second strategy – electrification

- Push on plug-in electric vehicles and other plug loads
 - <http://www.economist.com/news/leaders/21578679-electric-car-stalls-race-be-green-wheels-future-not>
- Conduct research, development and demonstration of new industrial processes that are electricity-intensive
- The results of this strategy will only payoff in the long run; they will provide very limited benefits in the near-term
- Efforts to boost electricity sales in the 1980s and 1990s have borne little fruit

Third strategy – the safe haven

- Become a wires company
- But many are already wires companies
- All wires companies face the risk of collecting insufficient revenue since the bulk of distribution charges are tied to sales and as sales growth slows down, they will not be able to cover their fixed costs

The fourth strategy – go on the offensive

- This strategy is premised on being able to out-sun SolarCity by creating a non-regulated affiliate that operates in other service areas
- It requires the creation of a new enterprise culture that will compete with mainstream solar companies
- This strategy does not fit with the core competency of the industry and is high risk
- Additional risk arises if net metering disappears

The first tactic – rethink rate design

- Shift from one-part volumetric rates to three-part rates that reflect costs more accurately and improve equity and efficiency
- The first part should be a fixed charge to cover metering and customer care services
- The second part should be a demand charge that covers the cost of being connected to the grid
- The third part should be a time-varying energy charge

The second tactic – rethink forecasting

- Sales models have been over-forecasting sales for the past five years because a key element is missing in the math – changing customer tastes and behavior
- The new models need to learn from how firms in competitive industries do their sales forecasts
- Besides relying on trend lines, they include insights from observational market research which involves frequent and ongoing interactions with consumers
- New data needs to be collected and added to the equations
- Consider forecasting peak demand through Quantile Regression rather than Ordinary Least Squares

The third tactic – rethink load and market research

- They need to be integrated and carried out on the same groups of customers, consistently over time
- Additionally, competitor offerings need to be studied and customer perceptions about those offerings need to be gleaned
- The objective should be to yield insights not just about the past and current patterns of use but about likely future changes

In closing

- The slowdown in sales growth is not an aberration but very much in line with the trend we have seen over the past six decades
- However, it is being driven by forces that are unique to the present circumstances, three of which have already manifested themselves and two of which loom on the horizon
- This is the time for strategic introspection and the deployment of new tactics

Continuing the conversation

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Presenter Information



AHMAD FARUQUI, PH.D.

Principal | San Francisco

Ahmad.Faruqui@brattle.com

+1.415.217.1026

+1.925.408.0149 (cell)

Dr. Ahmad Faruqui is a Principal with The Brattle Group whose work is focused on the full spectrum of customer-side issues involving demand forecasting, rate design, energy efficiency, demand response, and the smart grid broadly speaking. He has worked for more than three dozen utilities around the globe and testified before a dozen state and provincial commissions and legislative bodies. His work has been cited in *The Economist*, *The New York Times*, the *Washington Post* and *USA Today*. He has appeared on Fox Business News and National Public Radio. The author, co-author or editor of four books and more than 150 articles, he holds a Ph.D. in economics from The University of California at Davis and B.A. and M.A. degrees in economics from The University of Karachi, Pakistan.

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