Unleashing the Potential of the Smart Grid:
Energy Efficiency and Consumer Choice

Nat Treadway, DEFG
USAEE Dual Plenary Session
November 6, 2012, 4:00 p.m.
Austin, Texas
Panelists

• Perry Sioshansi, President, Menlo Energy Economics

• Scott Hinson, Pecan Street Home Research Laboratory

• John W. Jimison, Managing Director, Energy Future Coalition
My overview of consumer choice

1. **Consumers like choices** and they are demanding a greater variety of choices to control their bills and to get access to bill payment options

2. Consumer choice provides a **better match** between individual consumer preferences and resource supply

3. Consumer choice can occur through traditional vertically-integrated **electric utilities or through restructuring** with direct consumer access to suppliers

4. Advanced meters enable more sophisticated **pricing and advanced analytics**

5. Smart grid investments create new opportunities for **services on the customers' premises**; that is, smart grid enables choices in ways that would be foreign to 20th century electric system operators

6. **Convenience and control** are two dimensions or attributes of electric service that have not been properly recognized, understood or analyzed

7. Managing **individual consumer choice** is a challenge for electric utilities

So, what are some examples of consumer choice in action?
1. Home security and energy management

Alarm.com allows customers to monitor, control and manage security and energy.

“Energy management may become as routine as taking out the trash”

Information drives energy efficient behavior

*Source: Roy Perry, Alarm.com, before DEFG’s Demand and Energy Technology (DETech) Research Consortium, February 21, 2012.*
2. Prepaid energy customer experience

Initial Text

You are now receiving electricity from Direct Energy. You'll receive account, payment & alert messages. Text MYBALANCE to 32075 for info.

May 22, 2012 text

Daily Text

Direct Energy (10/24 - 11:59PM):
You have $13.94 (5 days). 29 kWh ($3.03) since last read. Rate: $0.330/Day, $0.090/kWh. Payment #5555555555

October 26, 2012 text

Building Brand

We noticed your daily bill went over $7 due to the heat. We have added $1 to your account to assist. Your new balance is 83.58

August 11, 2012 text

* Source: Texts received from Direct Energy by Nat Treadway for electric service at his home in Houston.
2. Prepayment and energy conservation

Prepaid energy is a voluntary option that appeals to consumers’ sense of convenience and control. Energy management comes through close monitoring of balances and through daily text of emails with usage information.

- DEFG’s Prepay Energy Working Group hired economist Michael Ozog, Ph.D., to analyze data from Oklahoma Electric Cooperative’s Prepaid Account Management System.
- Monthly billing data came from 1,200 residential prepaid customer accounts.
- Typical data set: 32 months of traditional service and 22 months of prepaid service, i.e., data from pre- and post-enrollment of the customer in the prepaid program.
- Confirms reductions in consumption in the range of 5-15% that appear in the literature.
- Confirms Salt River Project report of 12.8% for its residential prepaid energy customers.

"Estimated savings of 11.0% or about 2,250 kWh/year ($192/year)"

Monitoring and awareness saves 11%
3. Competitive markets, risks and resources

- In a competitive retail electricity market, two consumers may each seek the "lowest cost electricity" or "the best deal," but they have different definitions of "lowest" or "best"
- Even with similar homes and initial usage patterns, consumer “A” may lock in 10 cents for two years, while consumer “B” signs up for 8 cents on a month-to-month contract
- There is **no objective basis** for deciding who received the "lowest cost" or the "best deal"
- Neither “A” nor “B” nor any energy expert knows future market prices
- Both “A” and “B” are exceptionally well informed about their personal risk preferences!
- Two years from now, we can compare 24 bills. However, even at that time, we cannot assess the full cost of electric service, because it is difficult to measure investments on a customer’s premises, time spent by the customer to managing costs, intangibles
  - “A” may spend time and money investing in energy efficiency (to manage the bills)
  - “B” may spend time monitoring energy prices and switching (to manage the bills)
- **A consumer choice as straightforward as choice of contract length brings tremendous economic efficiency by aligning consumer preferences with preferred resources**

Choice of supplier drives efficient resource use
4. Consumer choice and time of use pricing

**1994 tariff sheet**

<table>
<thead>
<tr>
<th>Change</th>
<th>10.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tariff Class</td>
<td>On-Peak Hour</td>
</tr>
<tr>
<td>Minimum Usage</td>
<td>10.00 per kWh</td>
</tr>
</tbody>
</table>

“Load shifting, of course, but real savings may come from insulation and pre-cooling”

“Free” may counter-intuitively reduce use
Panelists

• Perry Sioshansi, President, Menlo Energy Economics

• Scott Hinson, Pecan Street Home Research Laboratory

• John W. Jimison, Managing Director, Energy Future Coalition
Energy and Environment Experts

- DEFG is a management consulting firm specializing in energy. We believe customer engagement is key to success, and we help our clients better connect with customers.