Why Real-Time Pricing is Better than Other Dynamic Pricing Rates

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January 29, 2013

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The Dynamic Duo for Electric Market Efficiency: Smart Grid and Dynamic Pricing

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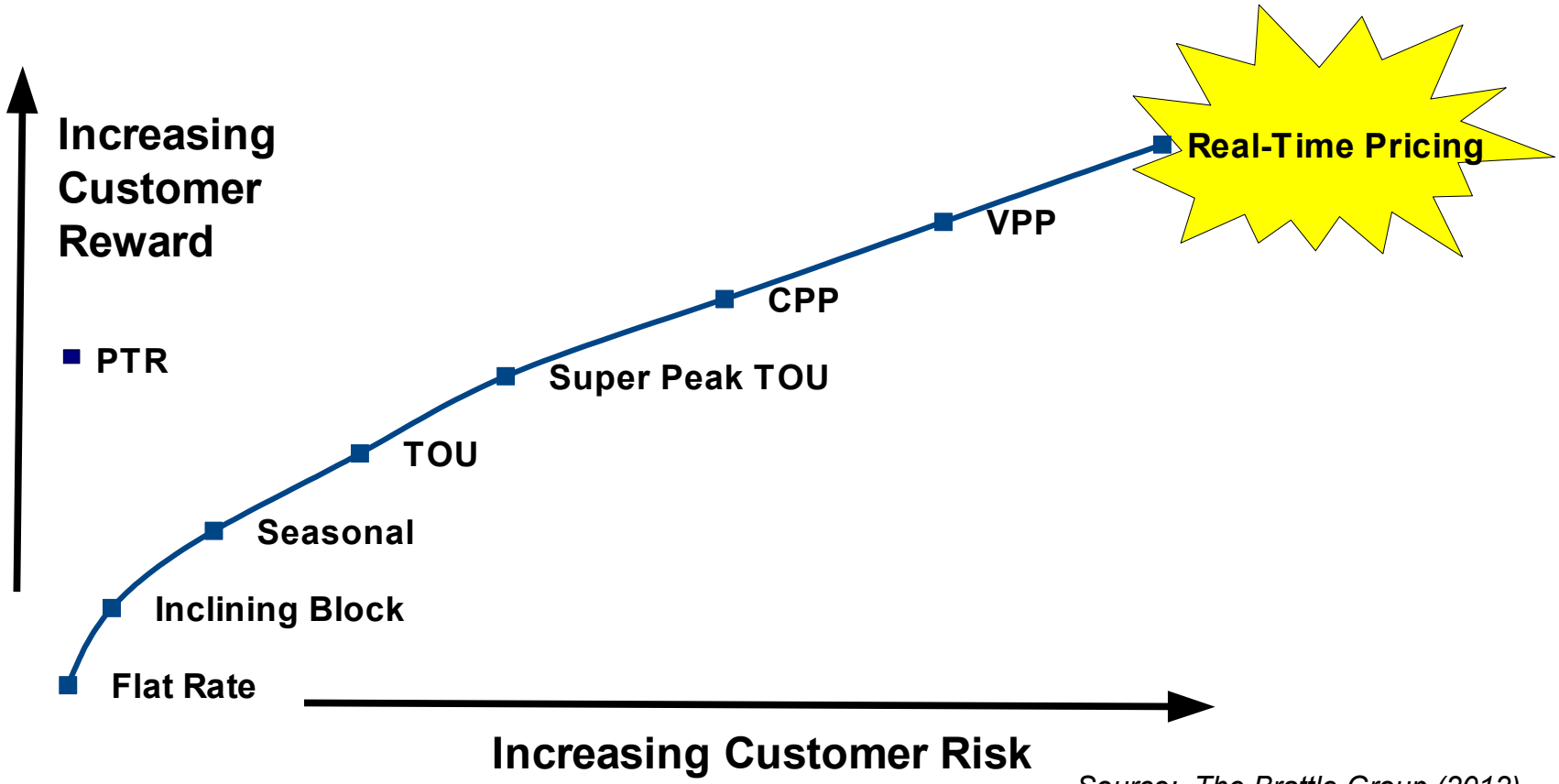
There are a variety of dynamic pricing rate designs to choose from.



Source: The Brattle Group (2012)

Real-Time Pricing offers the greatest opportunity for customer rewards. Can the risks be managed?

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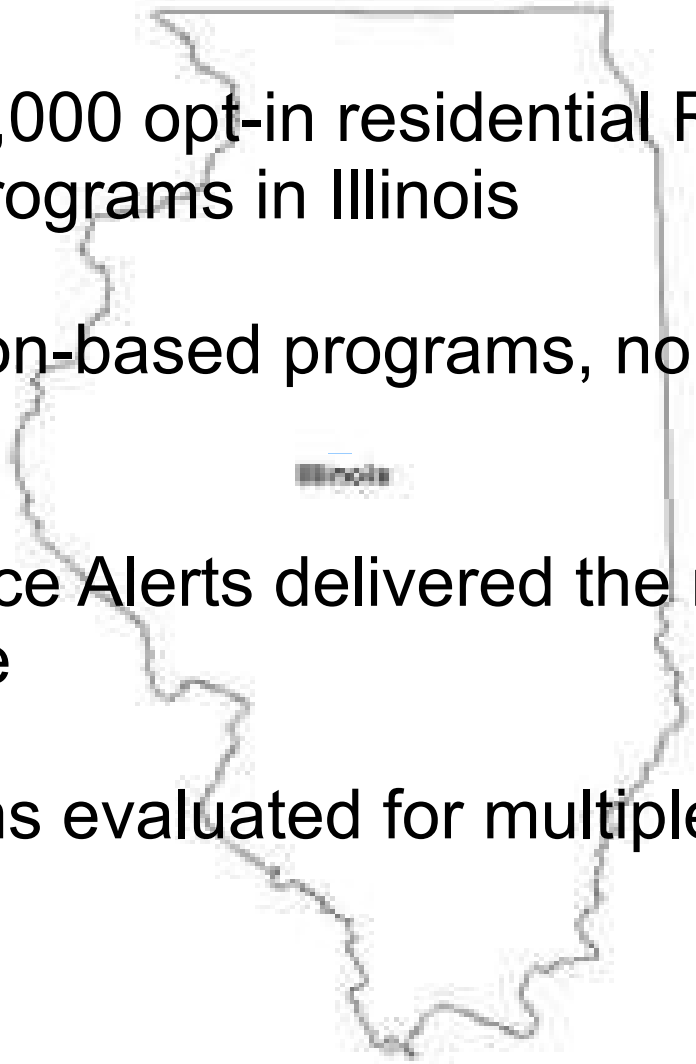
Outline for this Presentation

1. Proof that Real-Time Pricing Works

    a. *Energy Savings and Peak Reductions*
    b. *Net Benefits*

2. Why RTP rate designs serve both customers and utilities better than other dynamic pricing rates

Testing Grounds



- Over 20,000 opt-in residential RTP customers in two programs in Illinois
- Education-based programs, no new technology required
- High Price Alerts delivered the night before or real-time
- Programs evaluated for multiple years, 2007 to 2010

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Energy Savings and Peak Reductions

- Normalized peak load reduction of 0.5 kW per customer for High Price Alerts
- Reduction in overall summer electric energy use of 3 to 5%
  - Electric space-heat customers in southern Illinois use more energy in winter because it is a low price
- Average bill savings of 10 to 15%

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Net Benefits

RTP Benefits

Avoided Capacity Costs

Bill Savings for Participants

Reductions in Market Prices

Difficult to Quantify:
Health and Environmental Benefits
Economic Efficiency
Increased Customer Satisfaction
Increased National Security

Present, But Not Quantifiable:
Improved Power Quality and Reliability
Lower Price Volatility
Market Power Mitigation

RTP Costs

Start-up Costs

Meter Costs

Marketing Costs

On-going Customer Support

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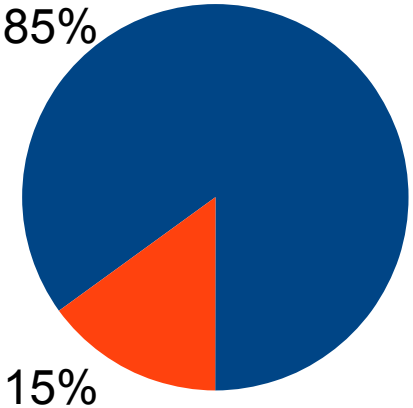
RTP Benefits

Avoided Capacity Costs

Bill Savings for Participants

Reductions in Market Prices

85%



15%

<u>Difficult to Quantify:</u>
Health and Environmental Benefits
Economic Efficiency
Increased Customer Satisfaction
Increased National Security

<u>Present, But Not Quantifiable:</u>
Improved Power Quality and Reliability
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Market Power Mitigation

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RTP Benefits – Avoided Capacity Costs

0.5 kW per Customer x

{Generation Capacity Costs ($/kW) +
Transmission Capacity Costs ($/kW) +
Distribution Capacity Costs ($/kW)}

Total Avoided Capacity Costs

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RTP Benefits – Bill Savings for Participants

Average Bill Savings over all Participants, 2007 to 2010: $180 per year

Sources of Bill Savings:

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RTP Benefits – Reductions in Market Prices (DRIPE - Demand Reduction Induced Price Effect)

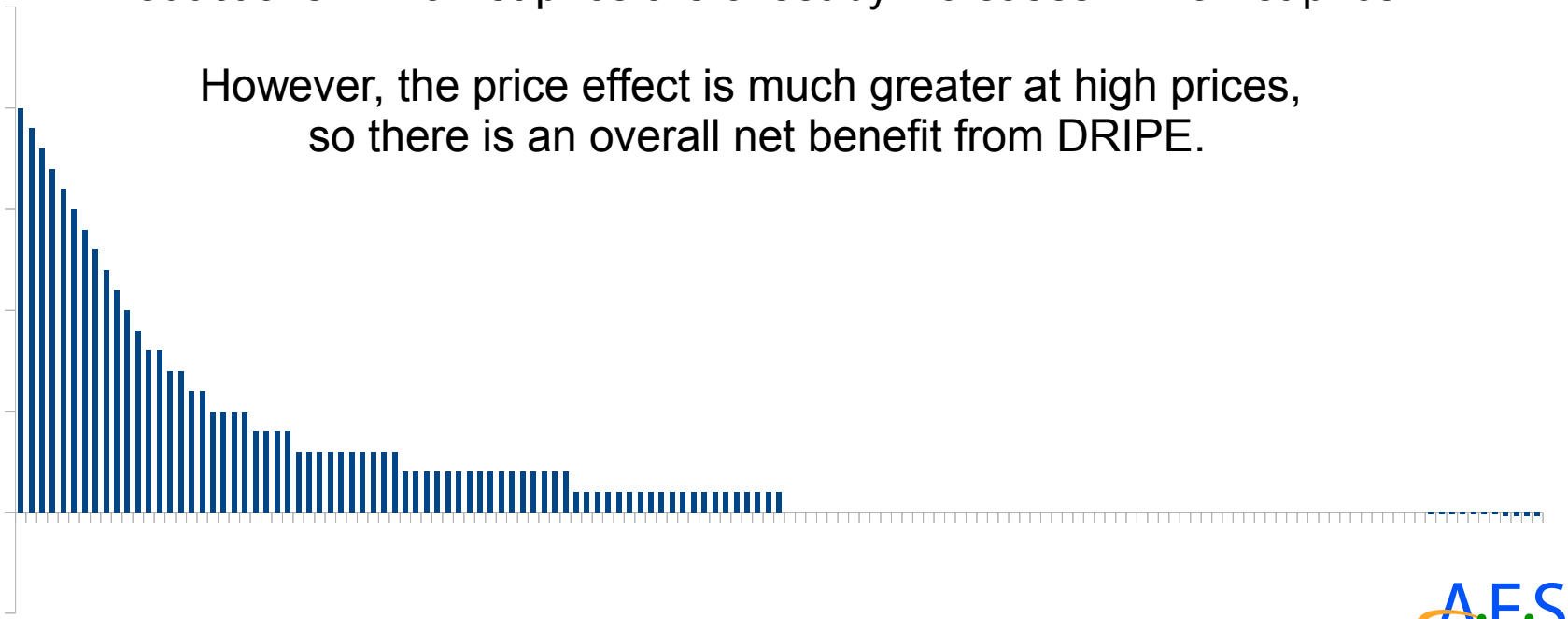
At high prices, RTP reduces demand and lowers market price.

At low prices, RTP increases demand and increases market price.

DRIPE is calculated for every hour of the year.

Reductions in market price are offset by increases in market price.

However, the price effect is much greater at high prices,
so there is an overall net benefit from DRIPE.



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RTP Benefits – Reductions in Market Prices (DRIPE - Demand Reduction Induced Price Effect)

DRIPE benefits go mainly to non-participants

Some to Residential non-participants at the utility

More to Commercial and Industrial non-participants at the utility

Most go to non-participants at all other utilities in the same Regional Transmission Organization (PJM, MISO, etc.)

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RTP Costs – Start-up Program Implentation

Build IT billing system
and develop program processes.

TIME: Approximately 1 year

COST: Approximately $1 million

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RTP Costs – Meter Costs

Both programs began before implementation of AMI.

Interval meters were installed for each new participant.

The greatest cost of the RTP programs was the incremental cost of interval meters.

Both programs charged a participant fee to help cover meter costs.

Source: Kristoferb/Wikipedia

With AMI, the greatest program cost will become zero

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RTP Costs – Marketing Costs

One-time cost
for each new participant

Improved marketing costs and methods have reduced marketing costs since the beginning of each program.

As new participants become a smaller share of total participants, the effect of marketing costs on net benefits declines.

Decatur resident Joe Green is smiling a lot these days after taking advantage of the Power Smart Pricing system for his home's electrical needs. He cut his winter power bill in half and by more than 20 percent for the year.

Source: Tony Reid, Central Illinois Herald & Review, May 2, 2010

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RTP Costs – On-going Customer Support

These are mainly fixed costs

<u>A third-party Administrator:</u>

Provides Call Center

Sends Seasonal Mailings with information on typical daily price curves and ways to save

Sends text, phone or e-mail alerts of upcoming high prices

Provides monthly and annual bill comparisons

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RTP Net Benefits from the Societal Perspective

BENEFITS

COSTS

20%	Avoided Capacity Costs
40%	Participant Bill Savings
40%	DRIPE

Net Benefits are highly positive looking at an on-going RTP program from 2007 – 2020.

This is true even if no new participants join the program.

Start-up costs were recovered in 4 to 6 years.

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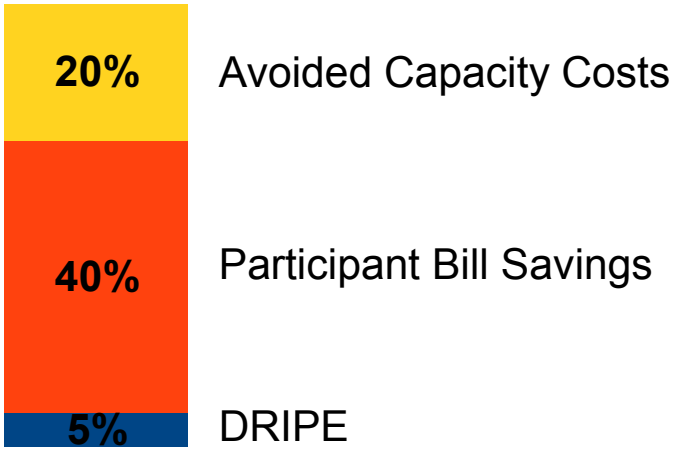
RTP Net Benefits for the Utility Residential Class



From the Utility Residential Class perspective the RTP programs show small but positive net benefits for 2007 - 2020.

Remember that this analysis includes incremental meter costs and zeroes out future bill savings from market price variances.

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Who Pays for the Program?

Program cost recovery
comes from the Residential class.

Both participants and non-participants benefit
from having the RTP option.

Exact rates differ for each utility
and are changing over time, but in general:

- Participants pay a couple dollars per month
- Non-participants pay a few cents per month

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Why RTP Outshines Other Dynamic Pricing Options

Optimal Economic Efficiency

Accurate price signals for customers create the most efficient market.

Maximum Bill Savings for Customers

Most customers participate in dynamic pricing options because they want bill savings. Bill savings are in the 5% to 20% range even with great attention and effort. RTP offers the maximum possible bill savings compared to any other dynamic pricing option (that is properly priced).

Less Rate Design Risk for Utilities

All other dynamic pricing options require rate-making assumptions that are likely to be wrong. In the absence of perfect rate-making, either the customer will get a reward they don't deserve or they won't get their full share of benefits.

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RTP Compared to Time-Of-Use (TOU)

TOU is more common, mainly because it can use a 'bucket' meter.

-The availability of Automated Meter Information (AMI) makes RTP feasible.

Some believe TOU rates are simpler for customers.

-Seasonal and three-tier rates can make TOU rates hard to remember.
-Changing prices for RTP can be simple if customers learn price patterns.

TOU rates are inaccurate compared to RTP.

-Why pay a peak rate at 4:00 in the afternoon on a Thursday in October?

Conclusion:

TOU rates are our dinosaurs from the past and are not meant for the modern world.

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RTP Compared to Critical Peak Pricing (CPP)

CPP rates are risk-free to utilities.

-However, they are totally backwards from a customer perspective. When you take action to reduce loads, you pay more and lose accumulated savings.

CPP rates often need to be set at levels higher than cost to get action.

-This is not an accurate reflection of the market.
-The high rates are not fair to customers and can cause them unneccessary harm if they find themselves unable to comply with a particular event.
-The limited number of CPP hours limits the total benefits customers can achieve.

Conclusion:

CPP rates carry a big stick and offer only a few carrots, making them a hard sell to customers.

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RTP Compared to Peak Time Rebate (PTR)

PTR has many advantages compared to CPP.

-Peak Time Rebates make sense to customers.
-They are also risk-free to customers, so they are an easy sell and can be 'opt-out'.

PTR is not as fair to individual customers as RTP.

-Baseline estimates are not always accurate.
-Some actions don't get rewarded, and some customers are rewarded for no action.
-Permanent conservation or load shifting gets no reward.

Conclusion:

Although PTR delivers accurate rewards to most customers, it is not always fair. For some customers, PTR is like spinning a roulette wheel to see if they will get a reward or not.

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RTP Compared to Variable Peak Pricing (VPP)

VPP is real-time pricing during peak times.

-VPP gives the benefits of RTP and accurate price signals during peak times.

VPP does not guarantee fair customer benefits during non-peak times.

-Flat rates during non-peak times mean that customers aren't getting the best price signals. They may be missing opportunity for additional savings.
-If the flat rate is not set perfectly, either the customers or the utility are at risk.

Conclusion:

VPP is a step in the right direction, but why not go all of the way with RTP?

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SUMMARY: Keep It Simple

A smorgasbord of dynamic pricing options confuses people.

-Keep it simple and just offer one. Differences in actual savings are minimal.

If you only offer one dynamic pricing option, offer RTP.

-RTP is cost-based and fair, more than any other rate
-RTP will always offer the greatest opportunity for savings
(unless the other rates aren't priced properly)
-RTP will fit the future without the need for rate adjustments or new rate designs

Offer RTP as an opt-in rate.

-Make it opt-in, because it is not risk-free
-RTP has the risk of high market prices, but this is a temporary risk
-RTP gives customers options for handling high prices
-As an opt-in rate, RTP will work to make all rates more cost-based

Imagine a world where people can move anywhere and know that their electric utility will always give them the option to have real-time prices.

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Questions?? Comments?? Let's talk . . .

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