Getting the Most Out of Hourly Pricing

Prepared by:

UtiliPoint International

RLW Analytics

For:

National Grid's Customer Meeting

Albany, NY

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New York State Energy Research Authority

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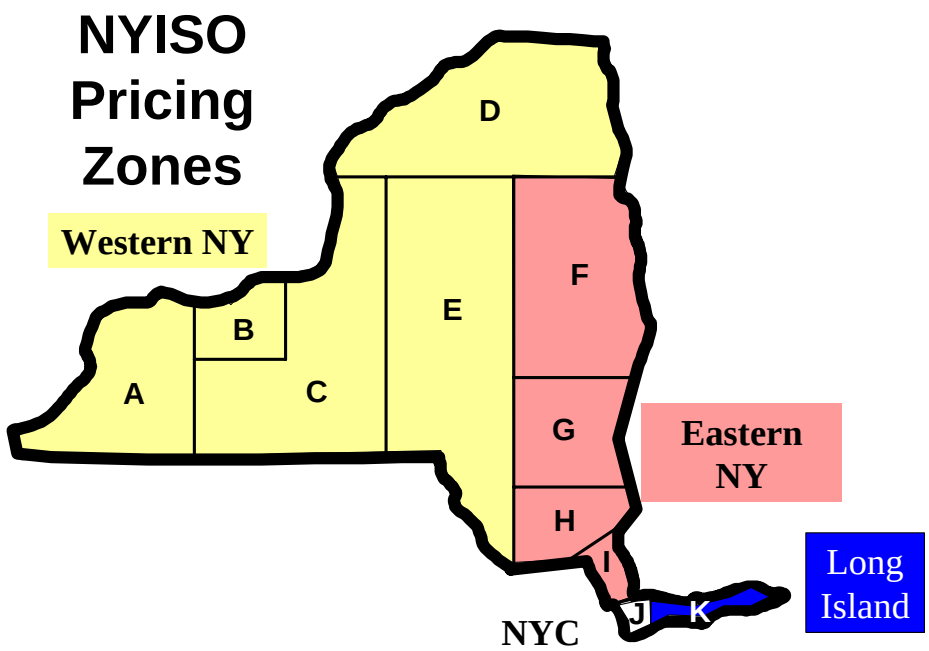
Presentation Outline

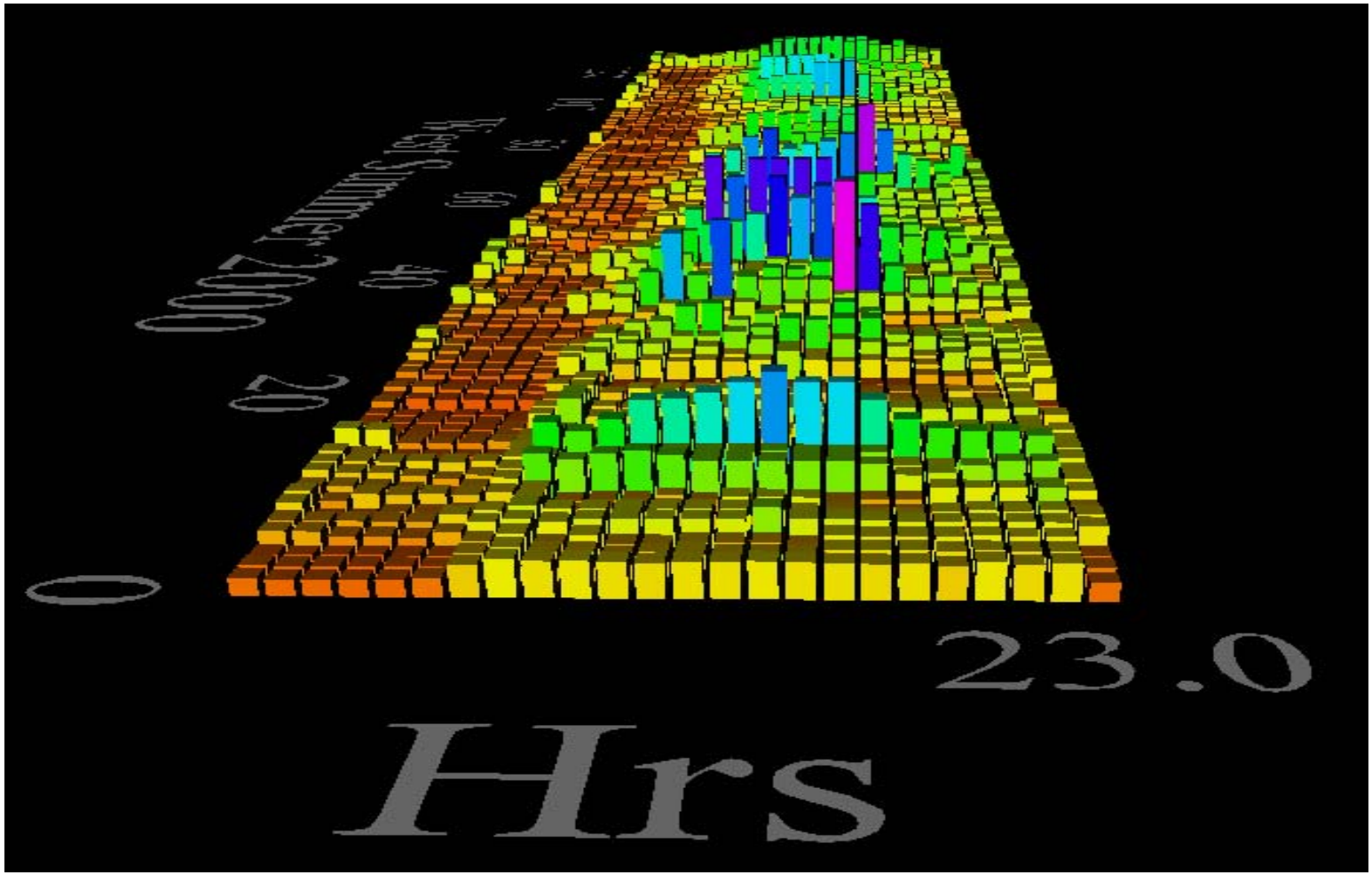
1. Day-Ahead Price Topology
2. Customer Experience with Hourly Pricing of Electricity
3. Who Responds to Prices, and Why?
4. Strategies to Get the Most Out of Hourly Pricing
5. References
6. Questions and Comments

Day-Ahead Price Topology

- New York City Zone (J)
- Eastern NY Superzone
  - Capital (F)
  - Hudson Valley (G)
  - Millwood (H)
  - Dunwoodie (I)
- Upstate NY Superzone
  - West (A)
  - Genesee (B)
  - Central (C)
  - North (D)
  - Mohawk Valley (E)



Upstate NY: DAM Summer 2000



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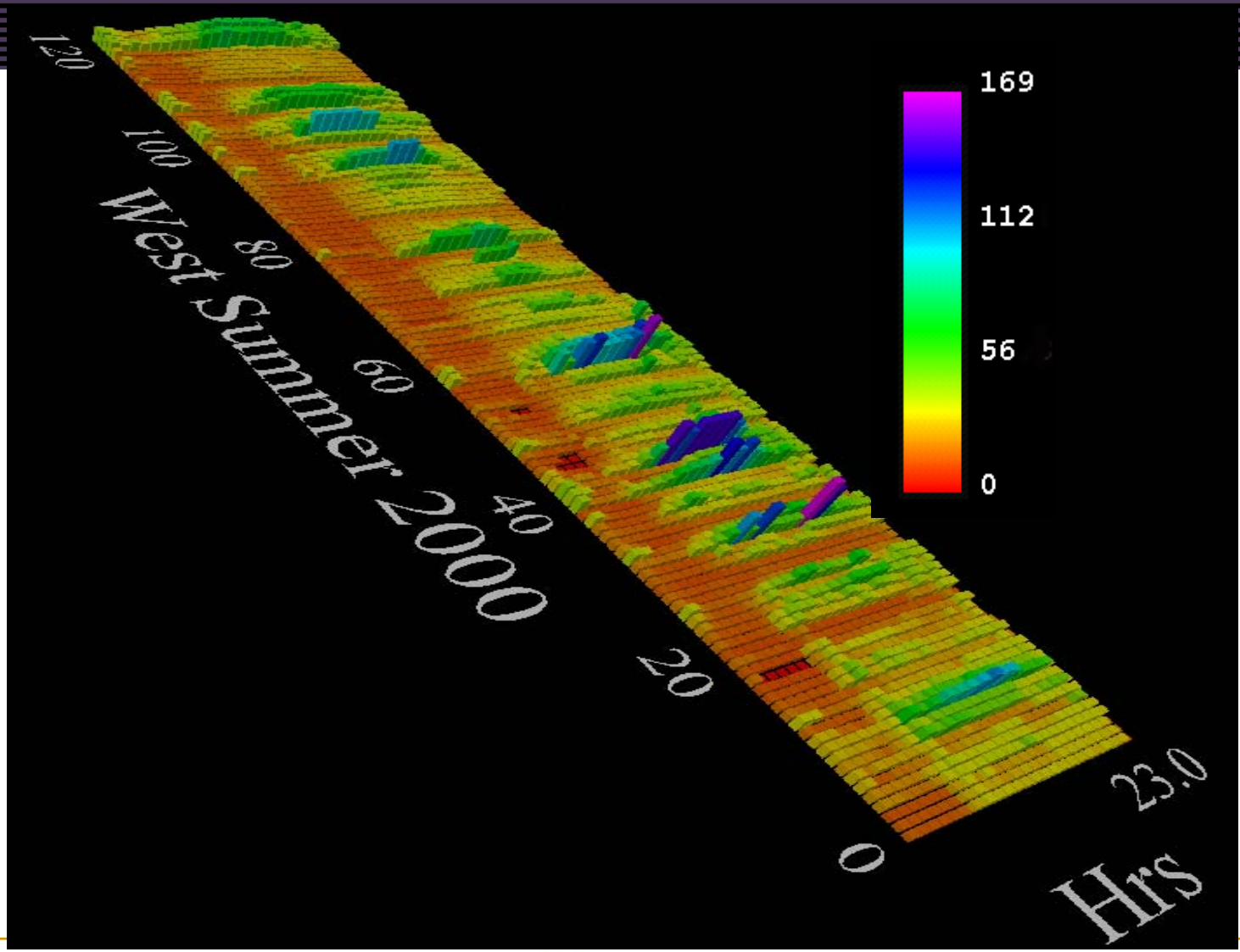

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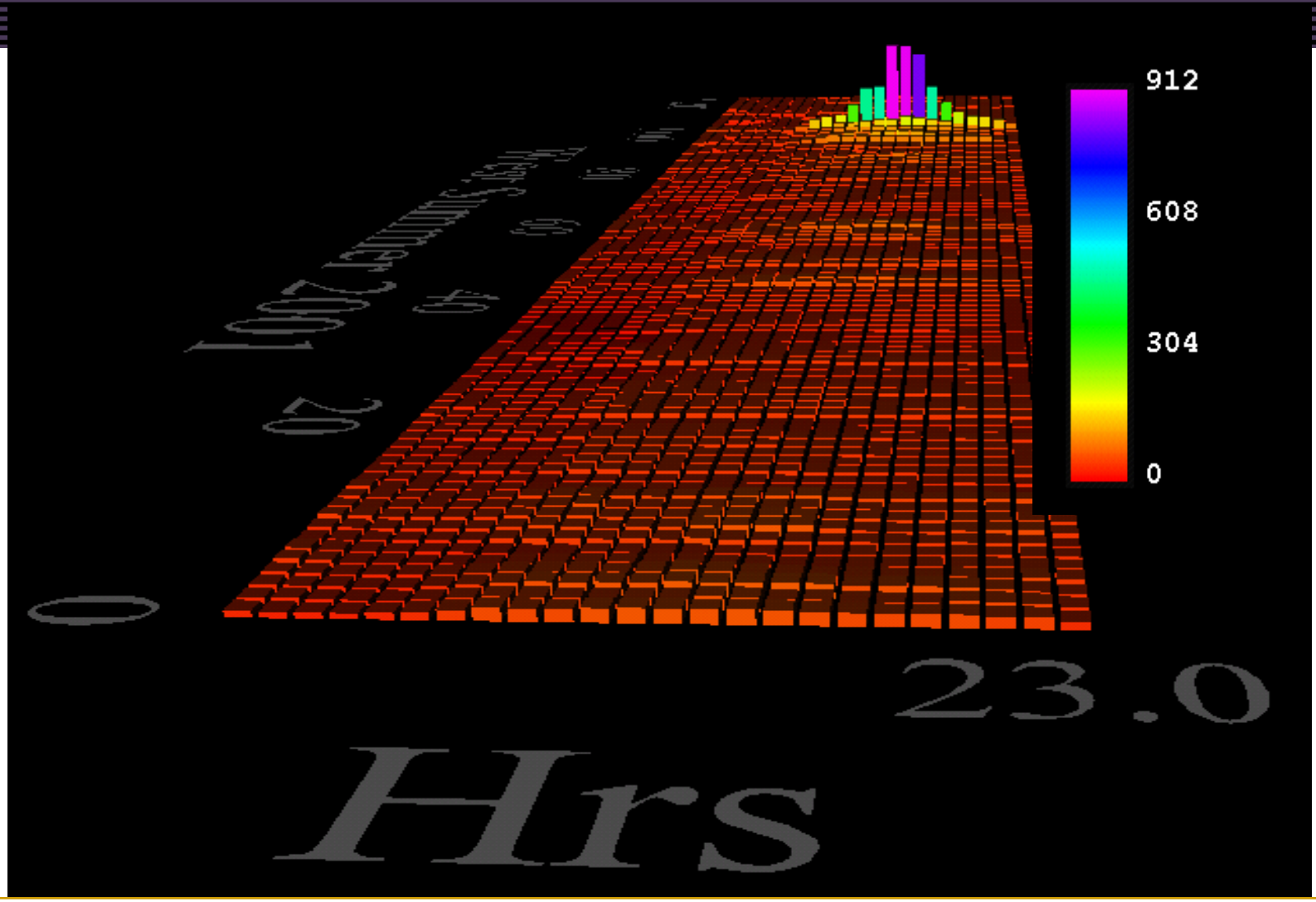

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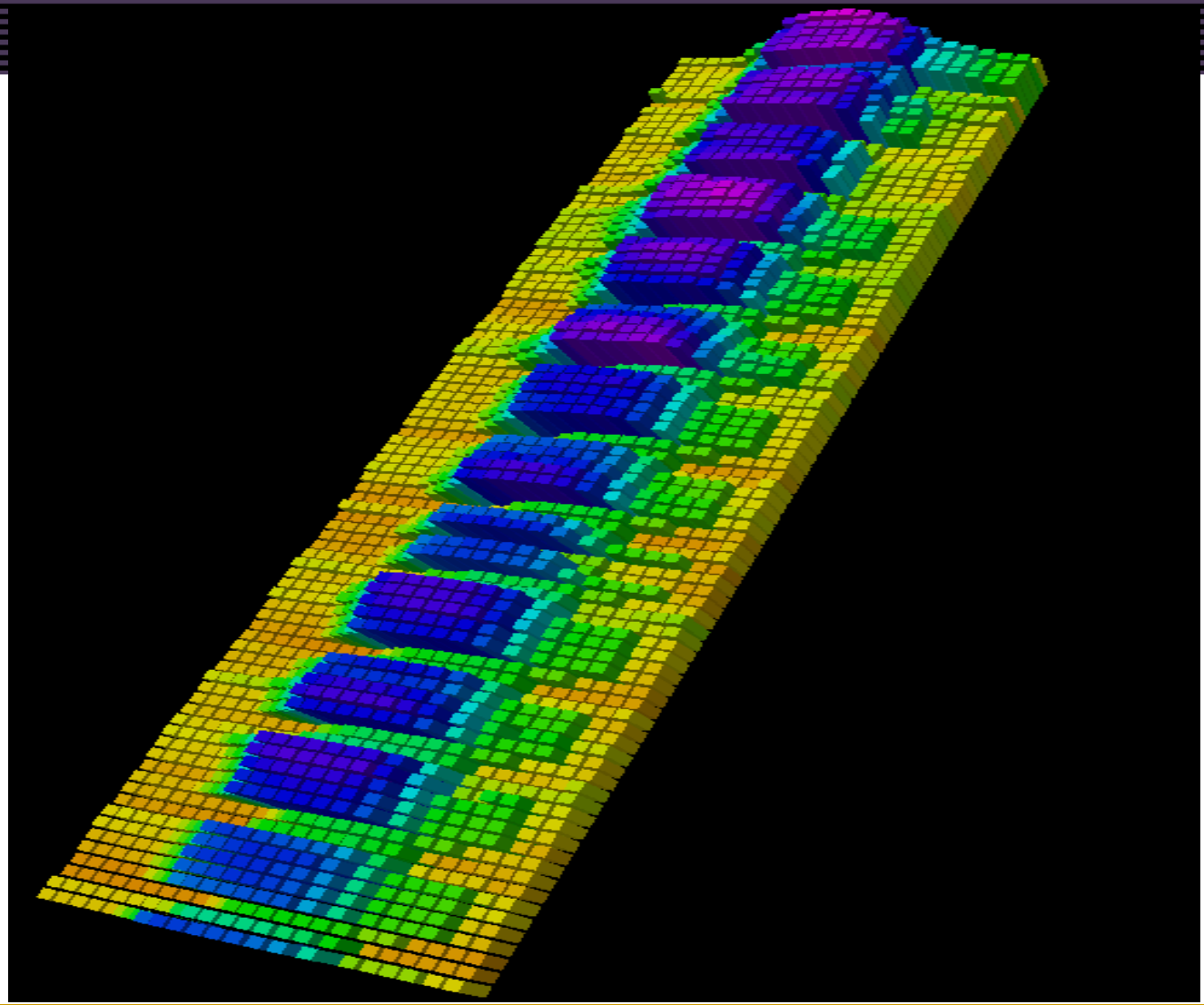
Education



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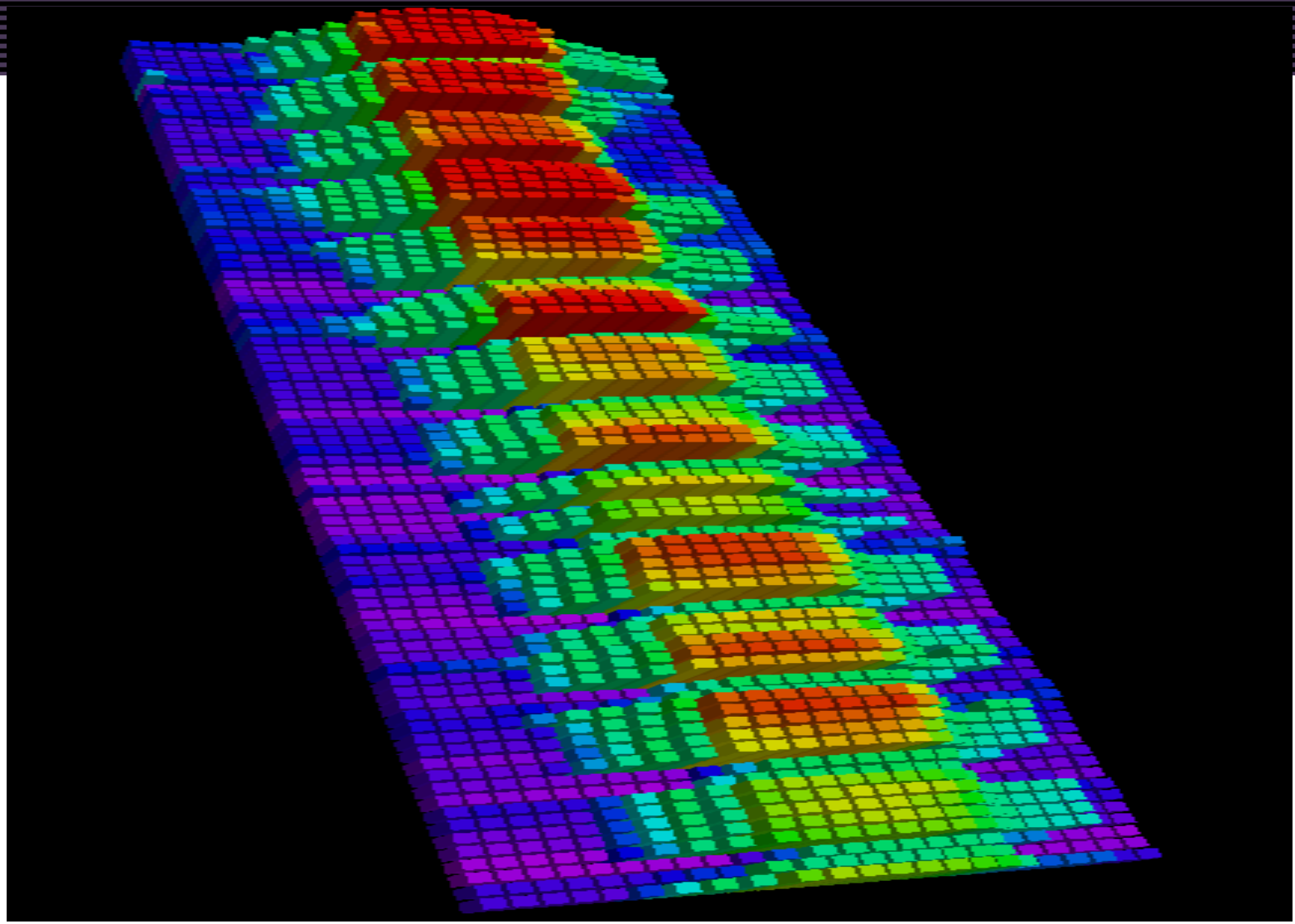
Fabrication



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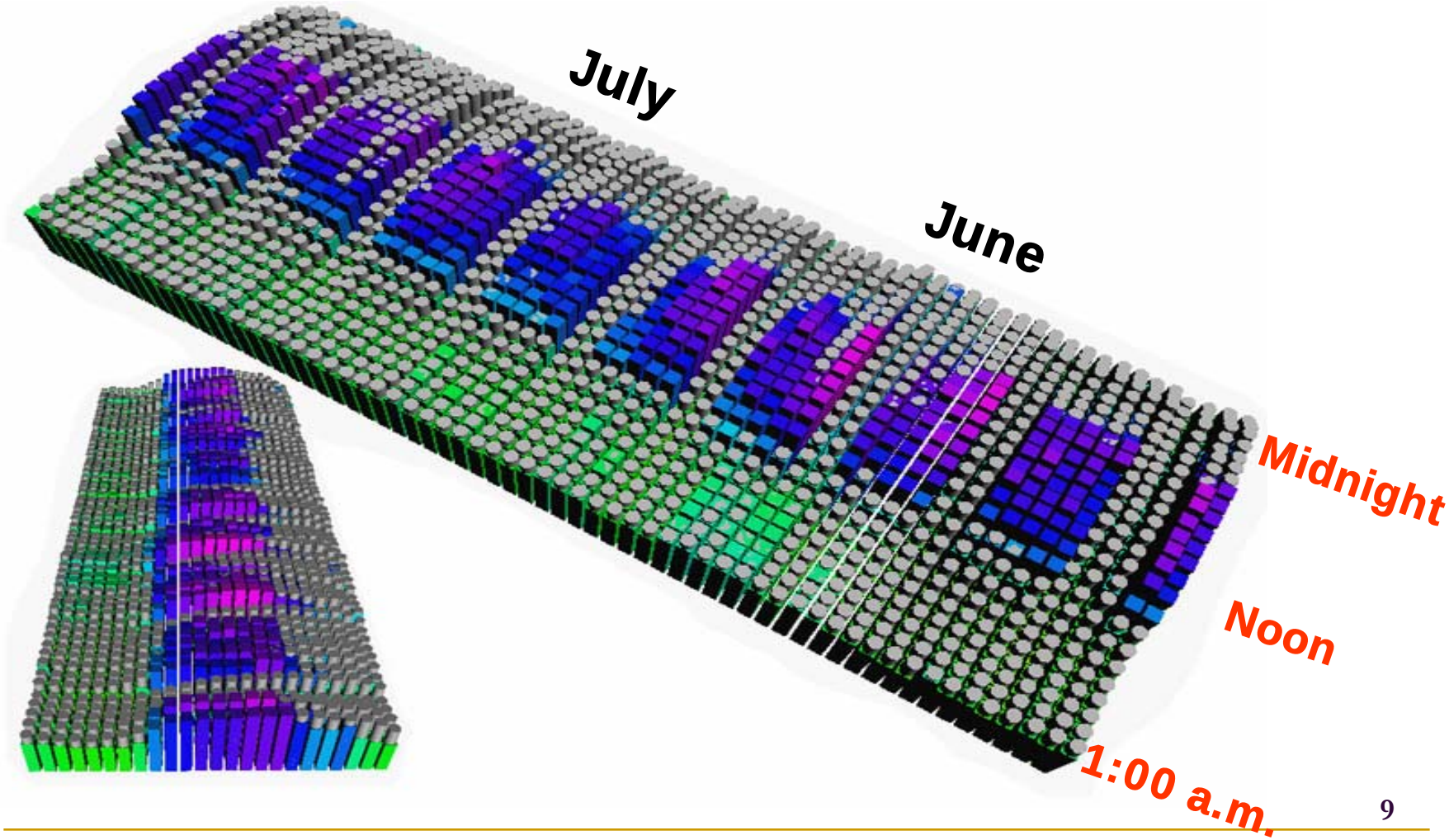
Retail Outlet



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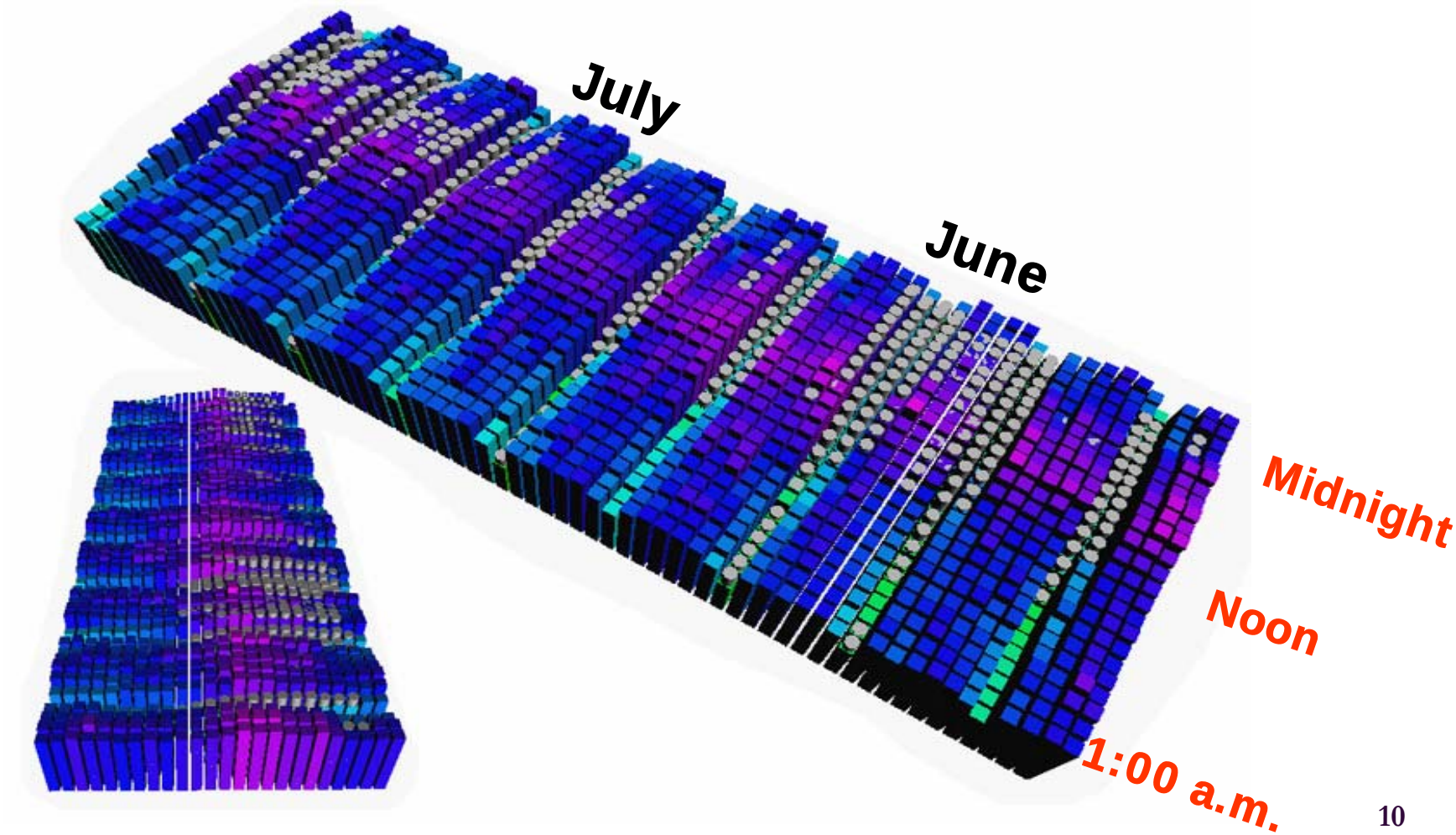
Grocery Store



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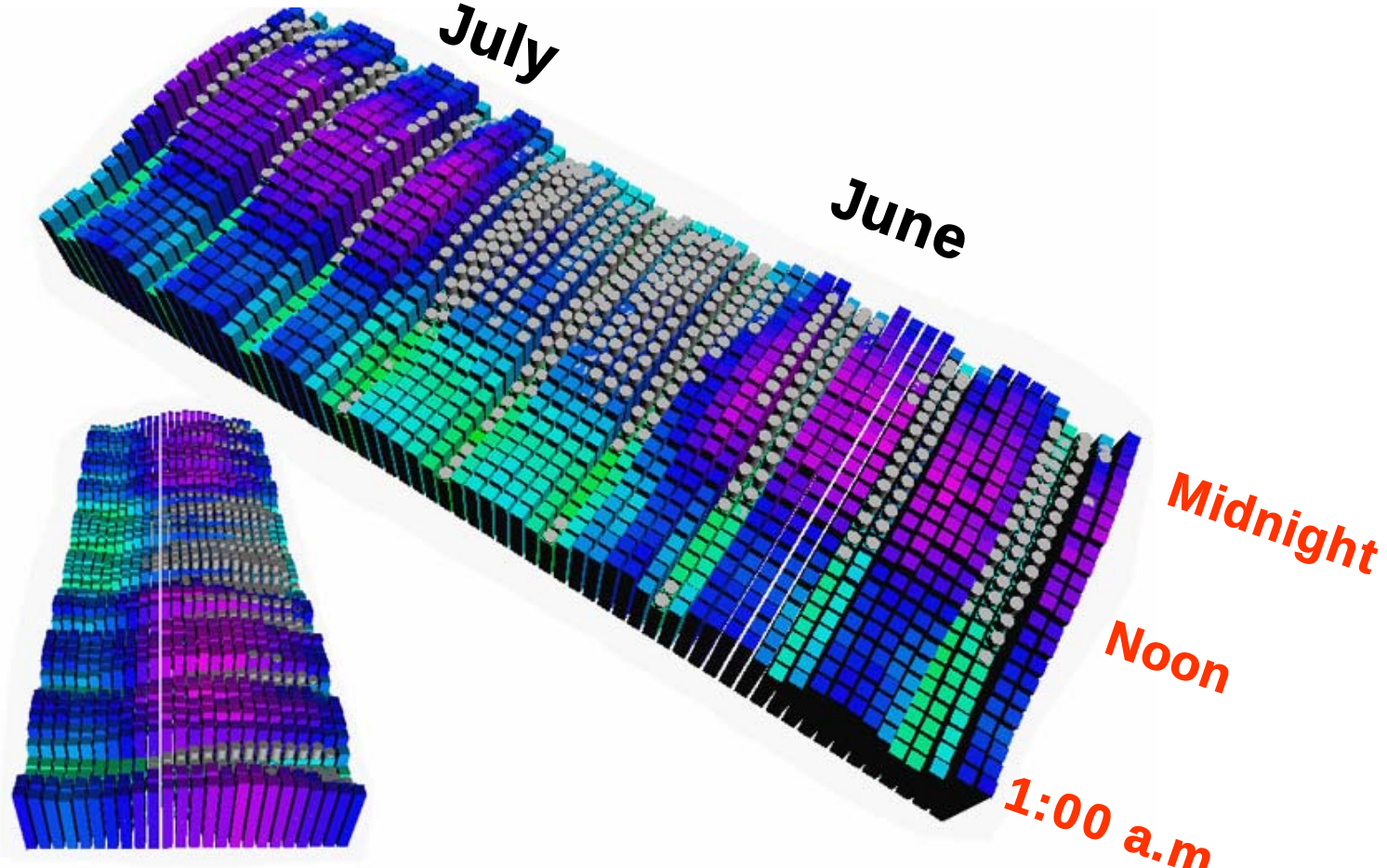
Heath Care



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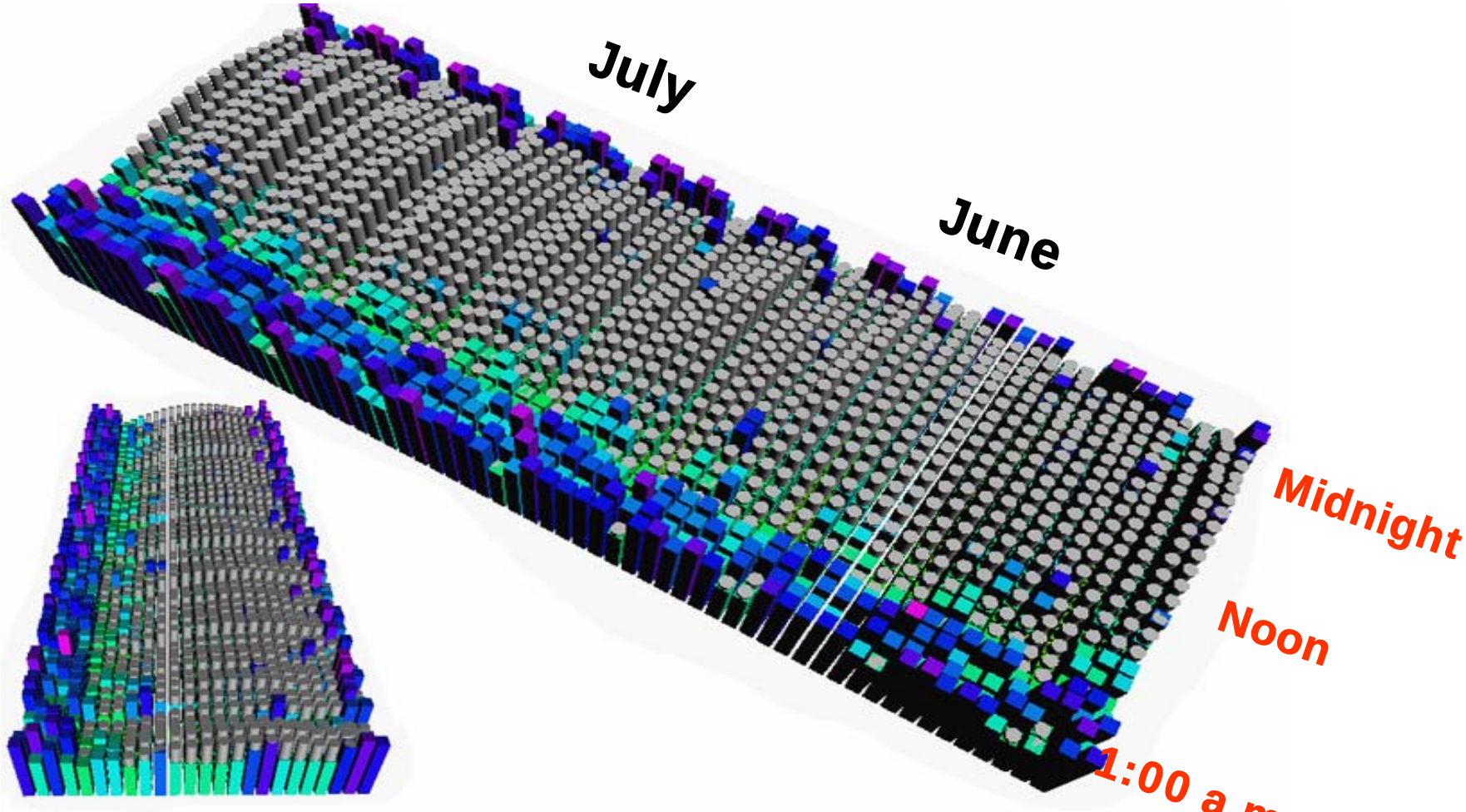
Newspaper



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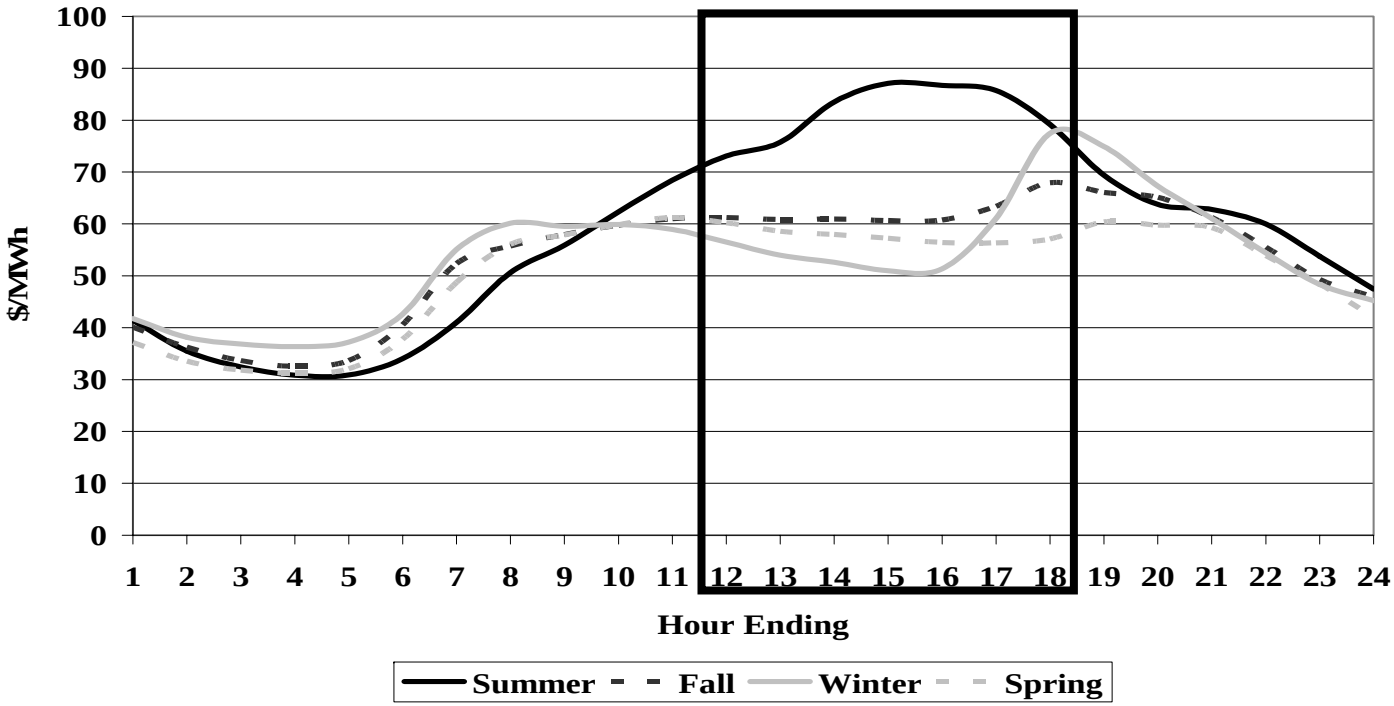
Historical Capital NY LBMP

Average Hourly Weekday Prices by Season

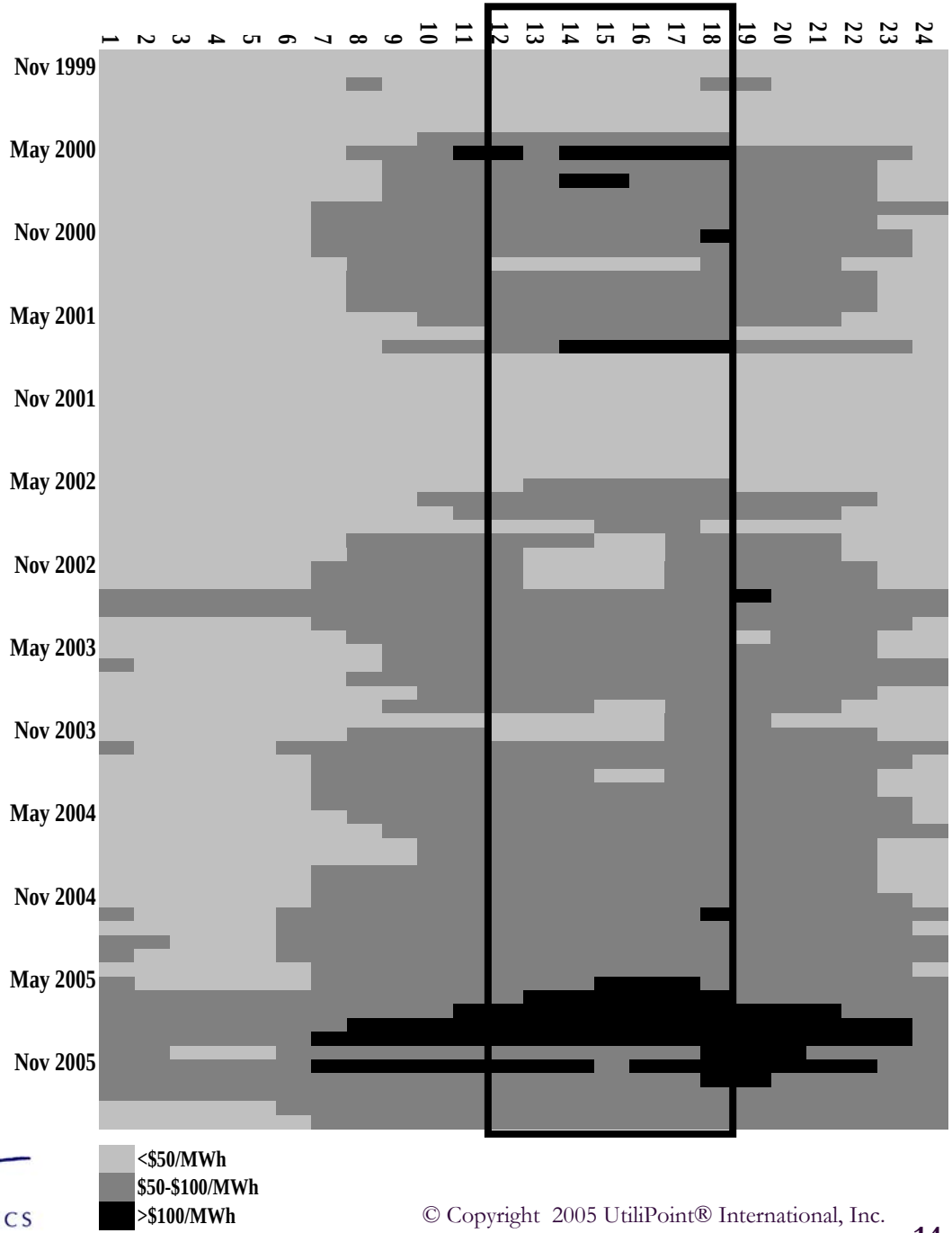


- Prices are higher in summer and winter,
- Prices are generally highest in the early to mid-afternoon hours in the summer and in the late afternoon during the winter

Historical Capital NY LBMP

Average Hourly Weekday Prices by Month

- Since 1999, prices have generally increased in all hours
- Higher than normal prices occurred in overnight hours over several months in 2003, 2004 and 2005
- Entire daylight hours in Sep., Oct., and Dec. '05 had prices > $100/MWh



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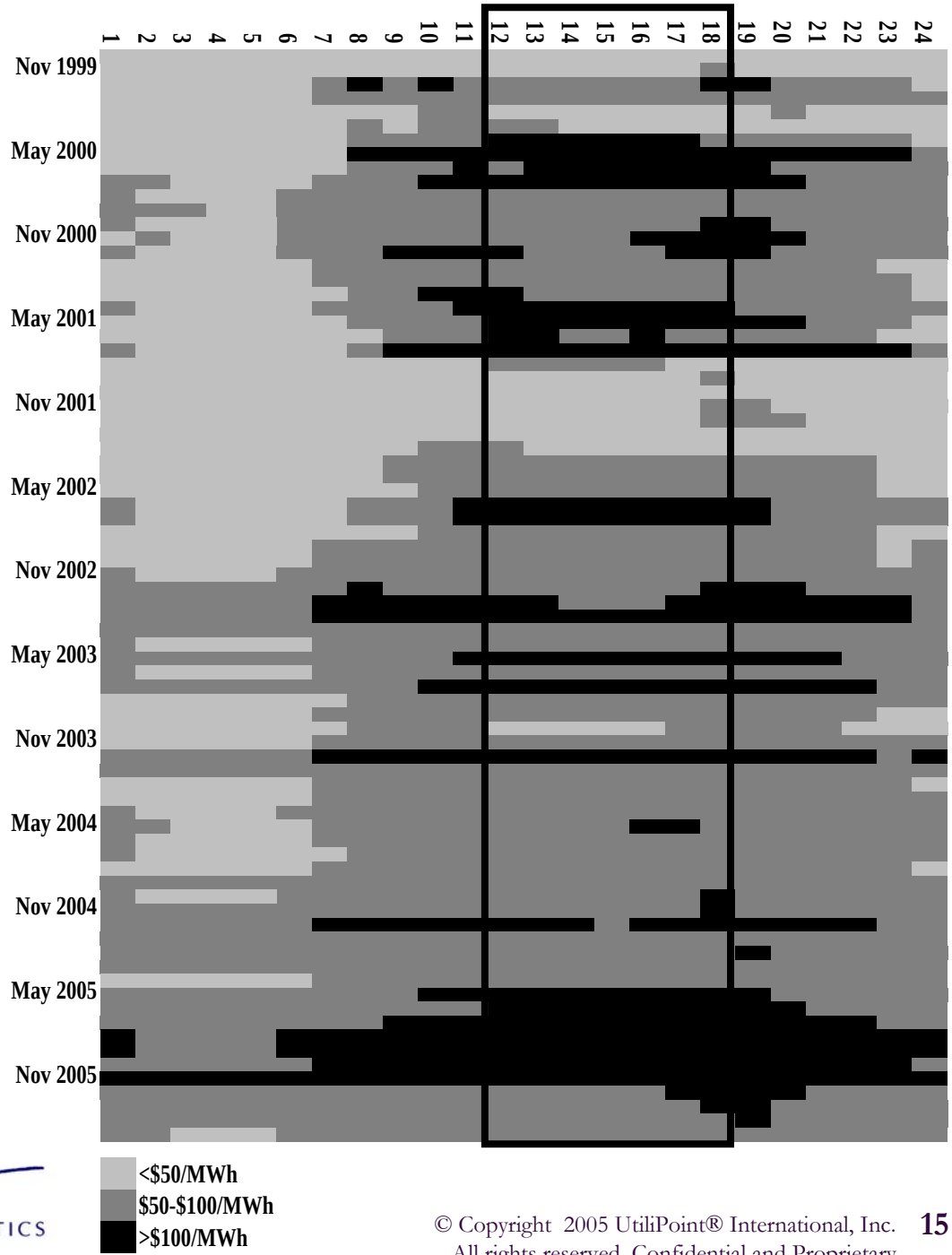
Historical Capital NY LBMP

Maximum Hourly Weekday Prices by Month

- Higher maximum hourly prices generally occur in summer and winter months
- Prices can exceed $100/MWh even in traditional off-peak (overnight) hours
- Significant number of high priced hours in late 2005 over nearly the entire day



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Historical Capital LBMP

Frequency of Prices Exceeding Threshold

Number of Hours in which Prices Exceeded a Specified Threshold -- Eastern New York									
Month	Threshold Price ($/kWh)								
	$0.10	$0.15	$0.20	$0.25	$0.30	$0.35	$0.40	$0.45	$0.50
Jan	203	3							
Feb	75	1							
Mar	102	8							
Apr	4								
May	24	1	1						
Jun	170	27	14	12	11	11	11	11	9
Jul	139	22	1						
Aug	467	102	34	18	10	9	8	8	8
Sep	447	48							
Oct	479	27							
Nov	114	2							
Dec	404	35							
TOTAL	2,628	276	50	30	21	20	19	19	17
% All Hours	4.99%	0.52%	0.09%	0.06%	0.04%	0.04%	0.04%	0.04%	0.03%

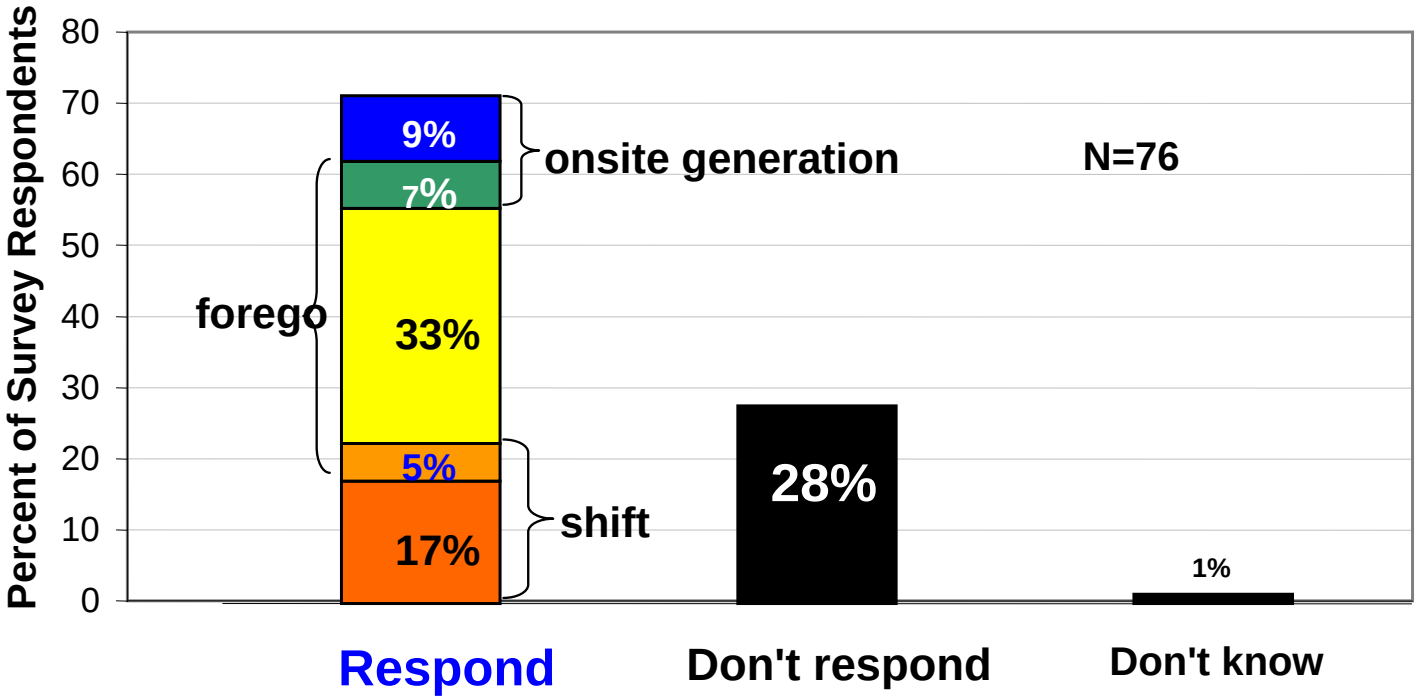
Future Hourly Price Topology

- **Trend 2002 – 2004 was higher average prices, lower price volatility**
  - **Most zones had sufficient generation or import capability**
  - **Occasional episodes of higher mid-day prices, especially in the summer**
- **2005 was different**
  - **Overall prices soared in the winter due to NG price rises**
  - **Highest price volatility since 2002, despite adequate supplies**
- **What's in store for 2006-2008?**
  - **Tightening supply situation in many zones**
  - **Limited transmission additions to relieve congestion**
  - **Uncertainty about NG and oil prices**

Customer Experience with Hourly Pricing

- Strategies for adapting to hourly prices
  - Reduce discretionary use
    - Reduce HVAC, dim lighting, shut down some elevator banks
  - Shift load to lower priced time of the day
    - Reschedule process, labor
  - Operate on-site generation
- Customer Experiences

Self-Reported Price Response Capability: What Customers Told Us



- 28% of customers say they are unable to curtail load
- 70% can either forego or shift load or utilize onsite generation

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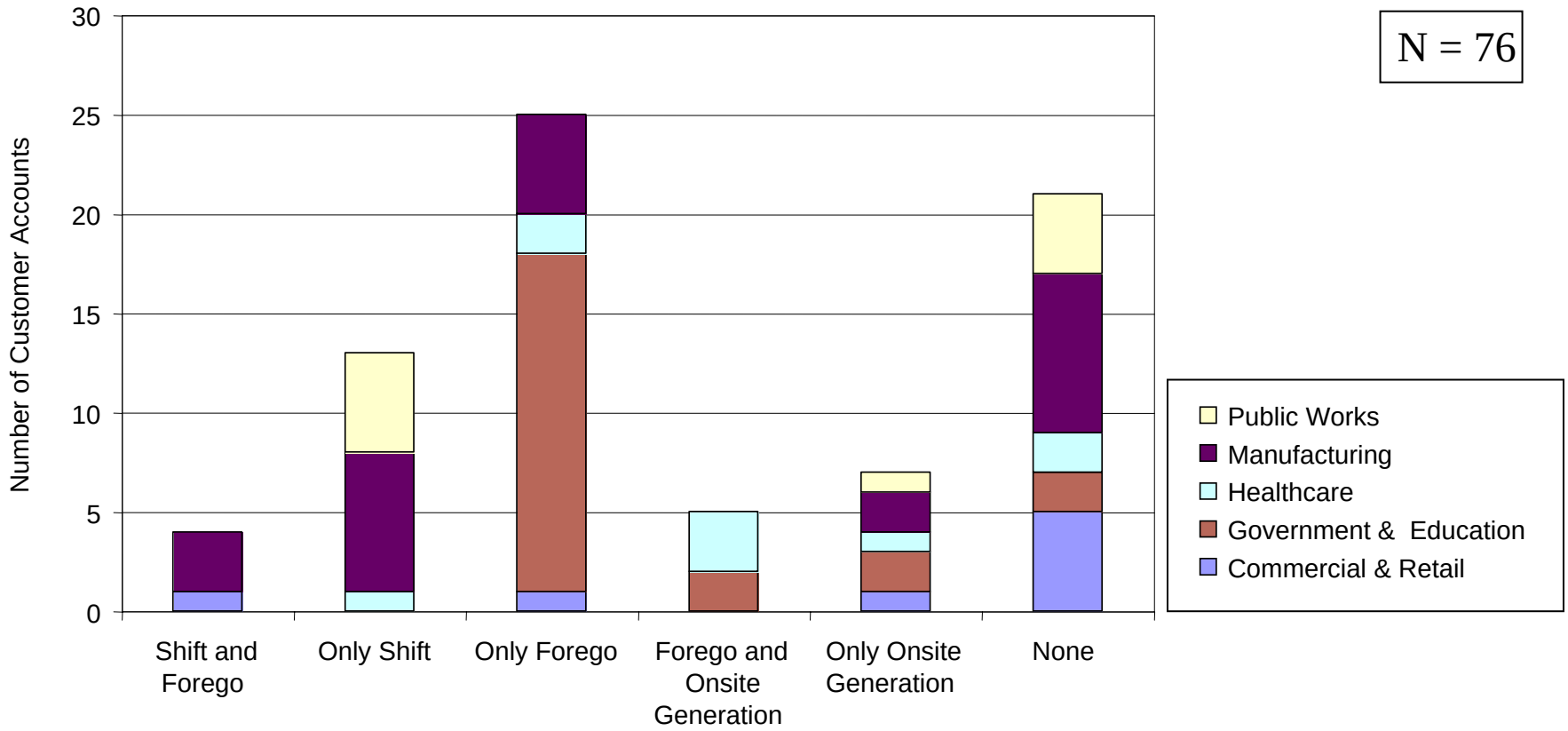
How Customers Say They Respond to Hourly Prices



- ~30% of customers say they are unable to curtail load
- ~70% can either forego or shift load or utilize onsite generation

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Responding to High Hourly Prices

2

Actions to Respond to High Prices	Percentage of Customers
Asked Employees to Reduce Usage	32%
Reduced/Halted Air Conditioning	28%
Shut Down Equipment	23%
Turned Off or Dimmed Lights	19%
Altered Major Production Processes	8%
None	6%
Reduced Plug Loads (e.g. Office Equipment)	6%
Shut Down Plant or Building	6%
Reduced/Halted Refrigeration/Water Heating	4%
Halted Major Production Processes	4%
Started On-Site/Backup Generation	2%

How Customers Report Using Enabling Technologies

Action	EMCS or Peak Load Mgmt Devices	Energy Information Systems (EIS)	Onsite generation (N = 42)
Respond to high prices	6	7	3
Reduce electricity bills	24	14	2
Reduce peak-demand cost	15	12	1
Facility/process control*	28	11	-
Monitoring and analysis*	-	9	-
Emergency backup	-	-	40
Cogeneration	-	-	2

- Only 15-20% of customers use DR enabling technologies to respond to high hourly prices; primarily used for facility/process automation control, to reduce overall utility bills and peak demand charges

Barriers to Responding to High Hourly Electricity Prices

(N=76)	Frequency
No Barriers Encountered	9
Barriers	
Organization/Business Practices	
• Insufficient time or resources to pay attention to hourly prices	39
• Institutional barriers in my organization make responding difficult	23
• Inflexible labor schedule	16
Inadequate Incentives	
• Managing electricity use is not a priority	17
• The cost/inconvenience of responding outweighs the savings	17
Risk Averse/Hedged	
• My organization's management views these efforts as too risky	10
• Flat-rate or time-of-use contract makes responding unimportant	9

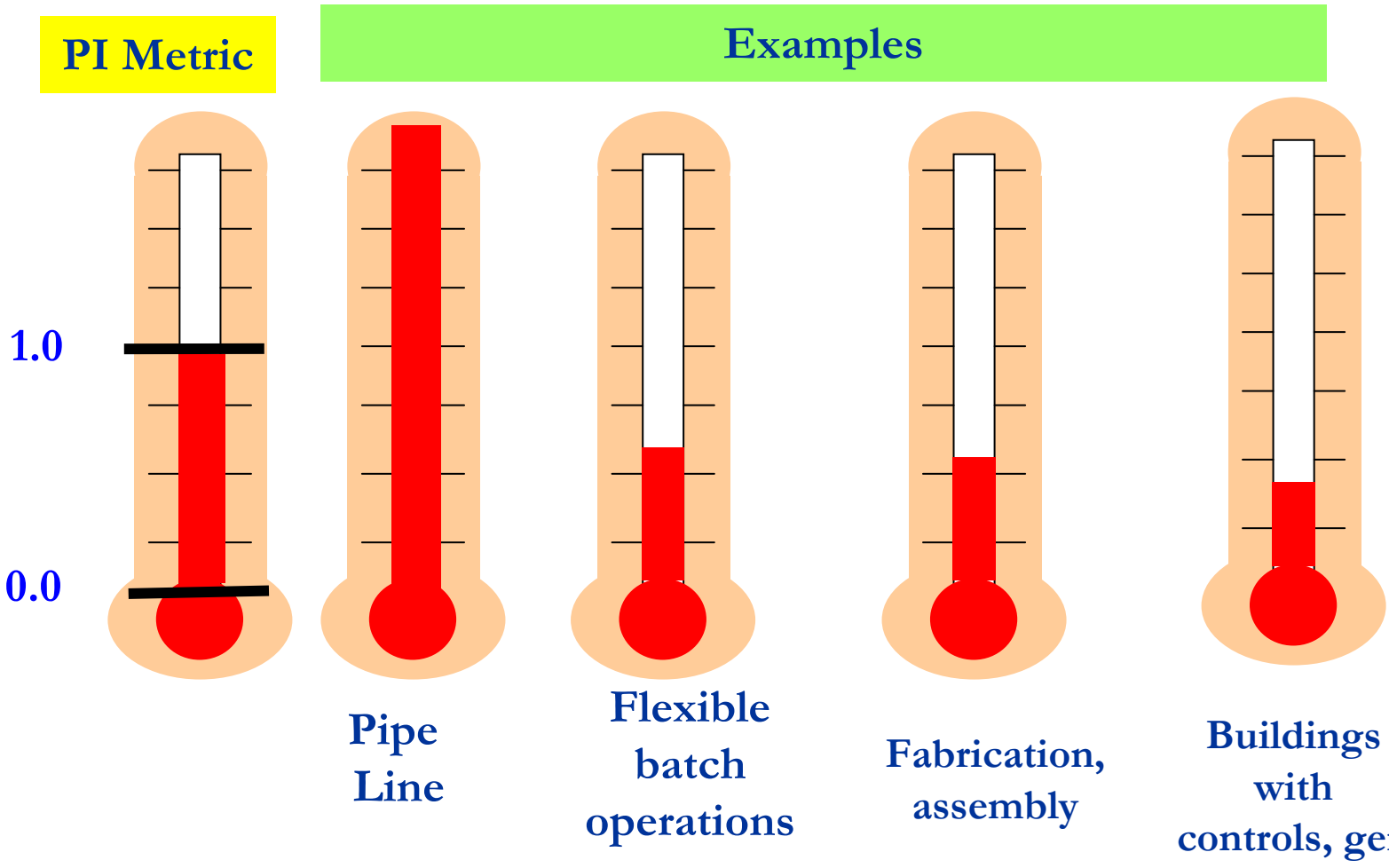
Tools are now available

More products available

Key Drivers to Price Response

- **Customer Circumstances**
  - Management commitment, internal champion
  - Operable on-site generation
  - Process or business activity flexibility, extra capacity
  - Discretionary, especially heat-sensitive loads
  - Surplus, underused capacity
- **Price Characteristics**
  - Event price topology
  - Event frequency
  - Value of incentives, impact of penalties

Intensity of Price Response – Relative Price Response Capability



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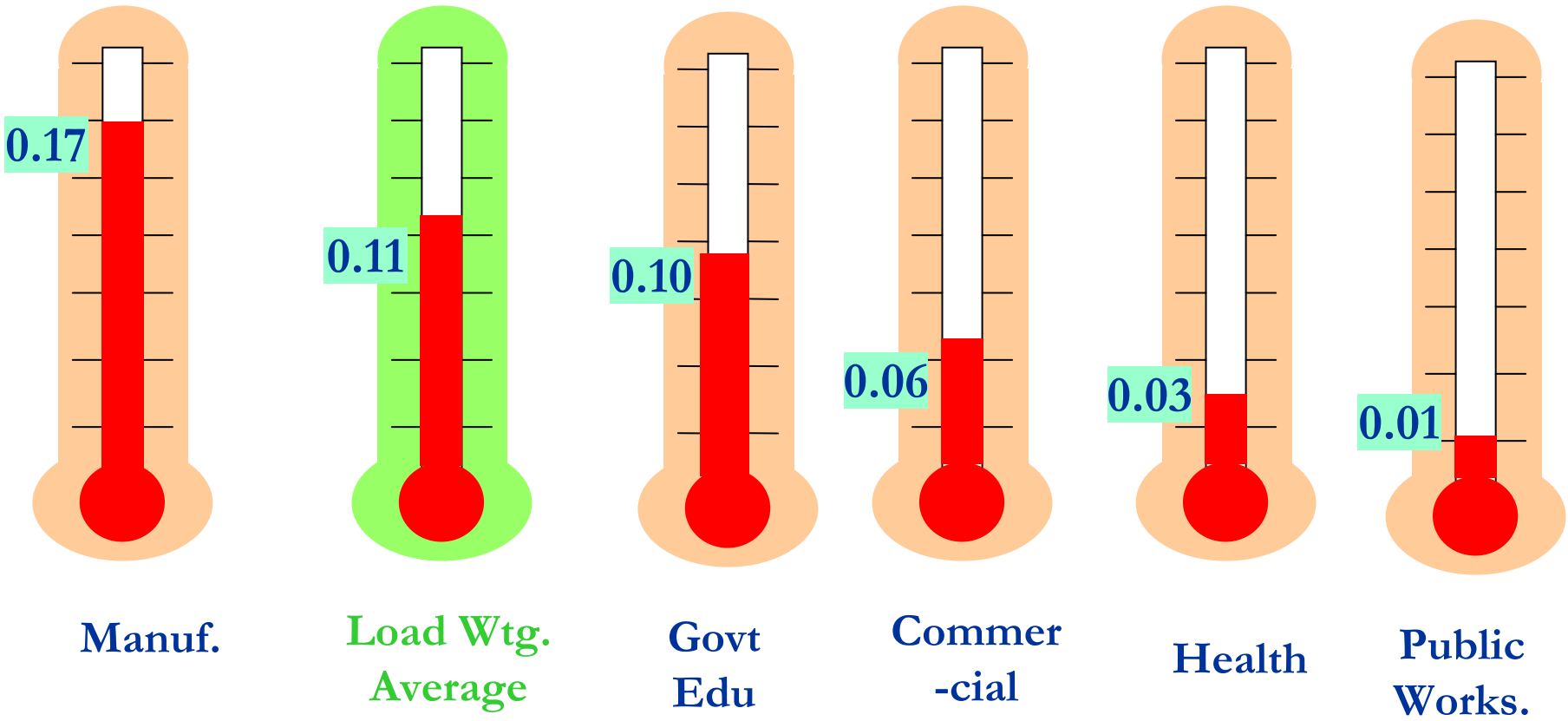
Intensity of Price Response – NGRID Customers after 5 Years Experience

Relative Price Response Intensity



Identifying Opportunities for Price Response

3

- "Can't control what you don't measure"
  - Need to start with an understanding of facility usage profiles and how different loads impact the profile
- Planning is important
  - Need to identify loads to be shed or shifted and who is responsible for implementing and notification
- Enabling Technologies can automate the process and maximize results

Strategic Alternatives

4

- Pay Hourly Prices
- Hedged Service for ESCO
- Financial Hedges
- Participate in NYISO Demand Response Programs

Strategy - Pay Hourly Prices

4

- **Default MHP from your utility**
- **Competitive ESCO equivalent**

Pros

- **Avoid paying the hedged service risk premium**
- **Access to low cost power many business hours of the year**
- **Managing electricity may produce spill-over benefits**

Cons

- **Requires price response actions**
  - Costs and inconvenience
  - May require investment
- **Exposure can change**
- **Price topology can change**

Strategy - Contract for Hedged Service with ESCO

4

- **Load covered - full or partial**
- **Time covered – daily, seasonal, episodic**

Pros

- **Bill certainty**
- **Adjust exposure as business circumstances change**
- **Leverage for negotiating a deal**

Cons

- **Involves paying a hedging premium**
- **Buyer's remorse; did I pay too much?**
- **Missed opportunities to lower bill**

Strategy - Financial Hedges

4

- Buy at hourly price
- Establish a side deal to limit price risks
  - Price Cap collar
  - Average price guarantee
  - Contract for differences

Pros

- Flexibility
- Transparency
- Customized solutions

Cons

- Specter of Sarbanes-Oxley
- Lack of comparative products -what constitutes a good deal?
- Availability may be limited

NYISO Demand Response Programs 4

- **Provide opportunities to patricide directly in wholesale markets, as a resource**
  - **EDRP – Emergency-only resources (2 hour notice)**
  - **ICAP/SCR – capacity resource, day-ahead warning, used when needed**
  - **DADRP – day ahead spot market sale of load curtailment capability**
  - **Ancillary services – real time (10 minutes) delivery of curtailments**
- **Available from utility, your ESCO, a curtailment service provider**

What is the Value of Price Response?

Source of inducement to adjust usage

	HP	ICAP	EDRP	DADRP
Type	Basic service	Supplement to either default HP or competitive product		
From	Utility	Utility, competitive retailer, curtailment service provider, direct from NYISO		
Inducement	New HR schedule every day	Two-hour notice to curtail enrolled kW		*Bid kW day-ahead to be paid to curtail*
Incentive	Adjust to pay lower prices	$/kWh payment for kWh curtailed • Up-front $/kW payment • Avoid penalty		*Bid kW day-ahead to be paid to curtail*

Benefits from Price Response

- Value per 100 kW load over April - September
- 2005 LMPs (Hourly pricing, DADRP)
- 20 curtailment hours per year (EDRP, ICAP)

Capital

Benefits of Price Response

Benefits	HP	ICAP	EDRP	DADRP
Range	$552 - 1,232	$100- 2,500	$0 - 1250	$ 0 - 548
Average (2001-5)	$838	1,000	$ 600	$128

Values represent estimates of benefits received by in recent years. Actual values vary according to the circumstances under which the customer enrolled in a program.

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LBNL/Utilipoint Reports on RTP Experience

5

"Real Time Pricing as Default or Optional Service for C&I Customers: Comparative Analysis of Eight Case Studies"

G. Barbose, C. Goldman, R. Bharvirkar, N. Hopper and B. Neenan. LBNL-57661, August 2005.

"Customer Strategies for Responding to Day-Ahead Market Hourly Electricity Pricing"

C. Goldman, N. Hopper R. Bharvirkar, B. Neenan, R. Boisvert, P. Cappers, and D. Pratt. LBNL-57128. August 2005.

Reports available at:
http://eetd.lbl.gov/ea/EMS/drlm-pubs.html

Comments and Questions

What's on your mind?

Take the test to see which product best fits your hourly pricing strategy!