Achieving a Robust Market on the Distribution Grid
by Mark B. Lively

Second Carnegie Mellon Conference
in Electric Power Systems:

Monitoring, Sensing, Software and Its Valuation
for the Changing Electric Power Industry

2006 January 11-12

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"People worked harder for a reward, especially one that coincided with patriotism." Tom Clancy, *Without Remorse.*

"Producers work harder for a reward, especially one that coincides with reliability." Mark Lively, in explaining WOLF.

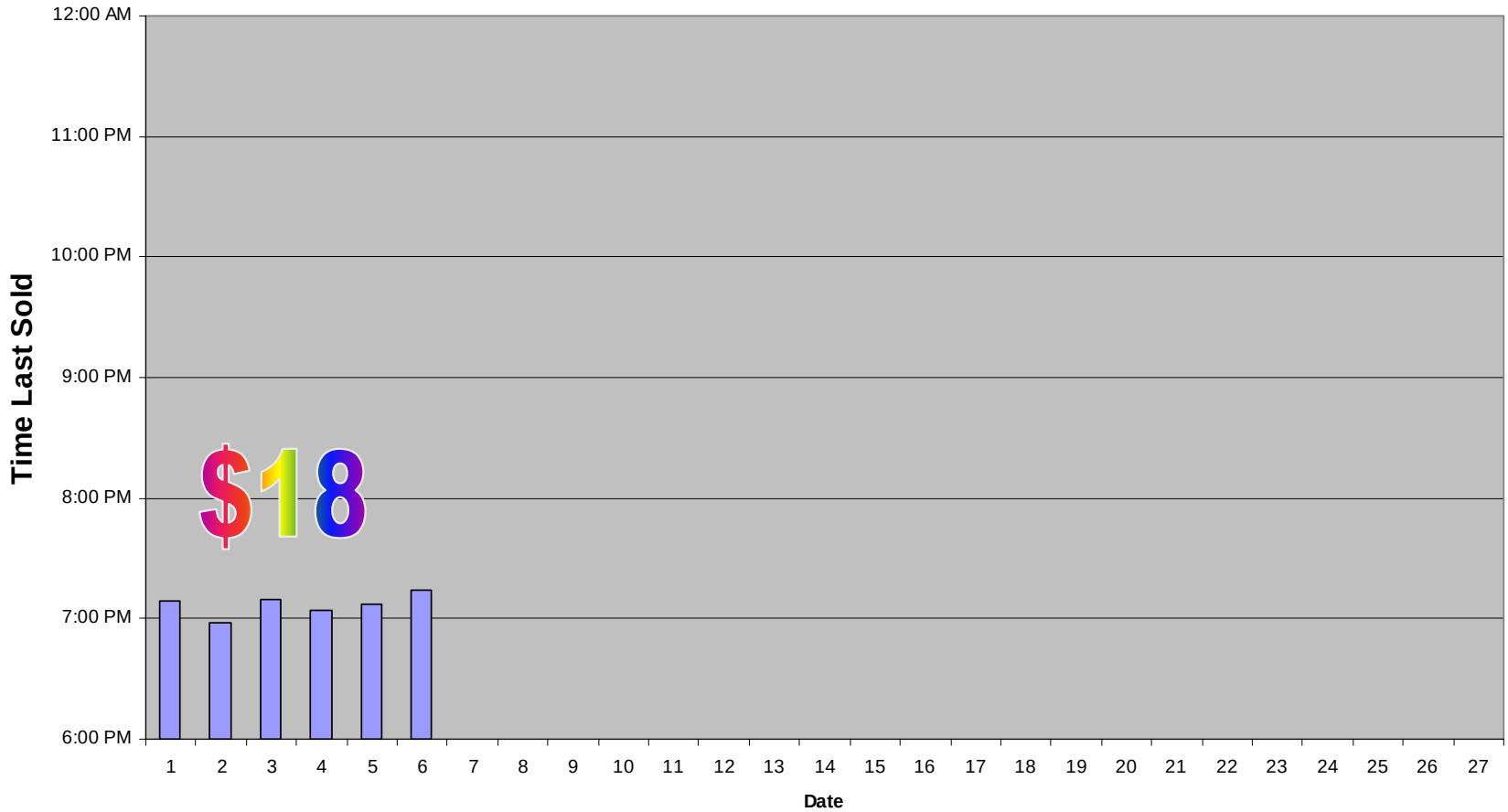
Achieving a Robust Market on the Distribution Grid

- Market Examples
- Market Theory
- Electric Applications

Market Examples

- Cantina D’Italia
- Leon Walras
- Walrasian Auctions
- Hurricanes Katrina & Rita

Basil Stuffed Veal Chops



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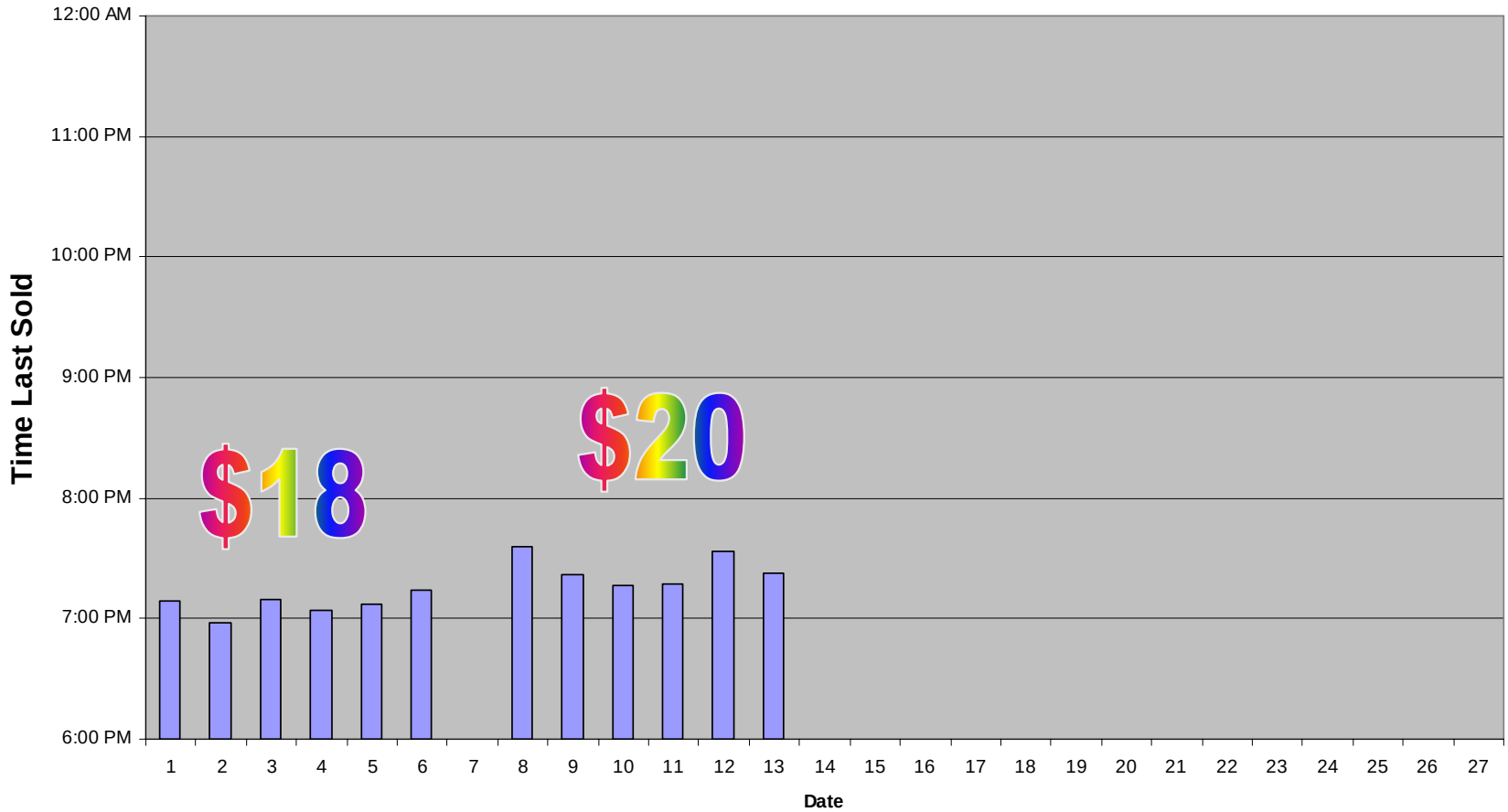

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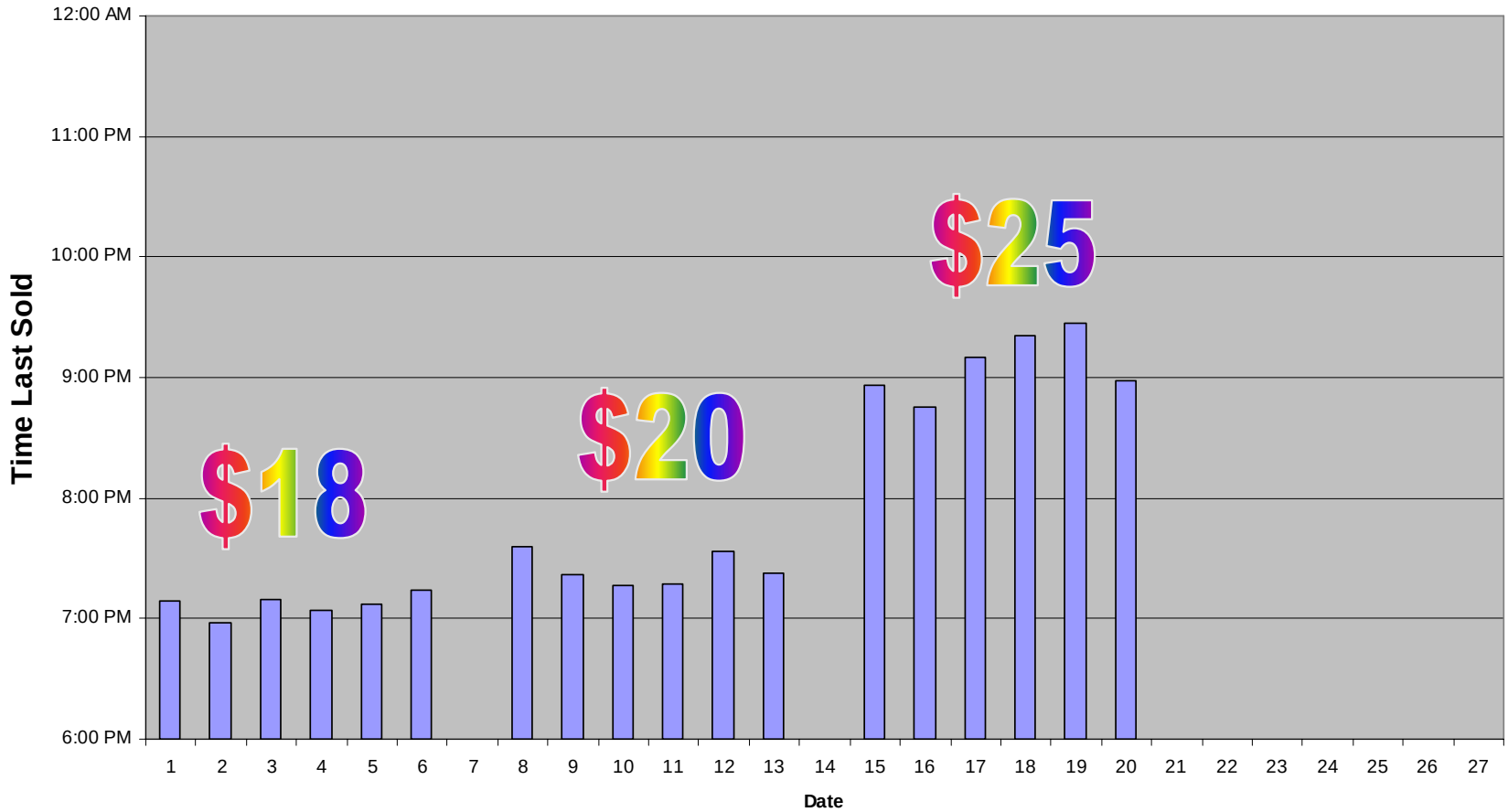

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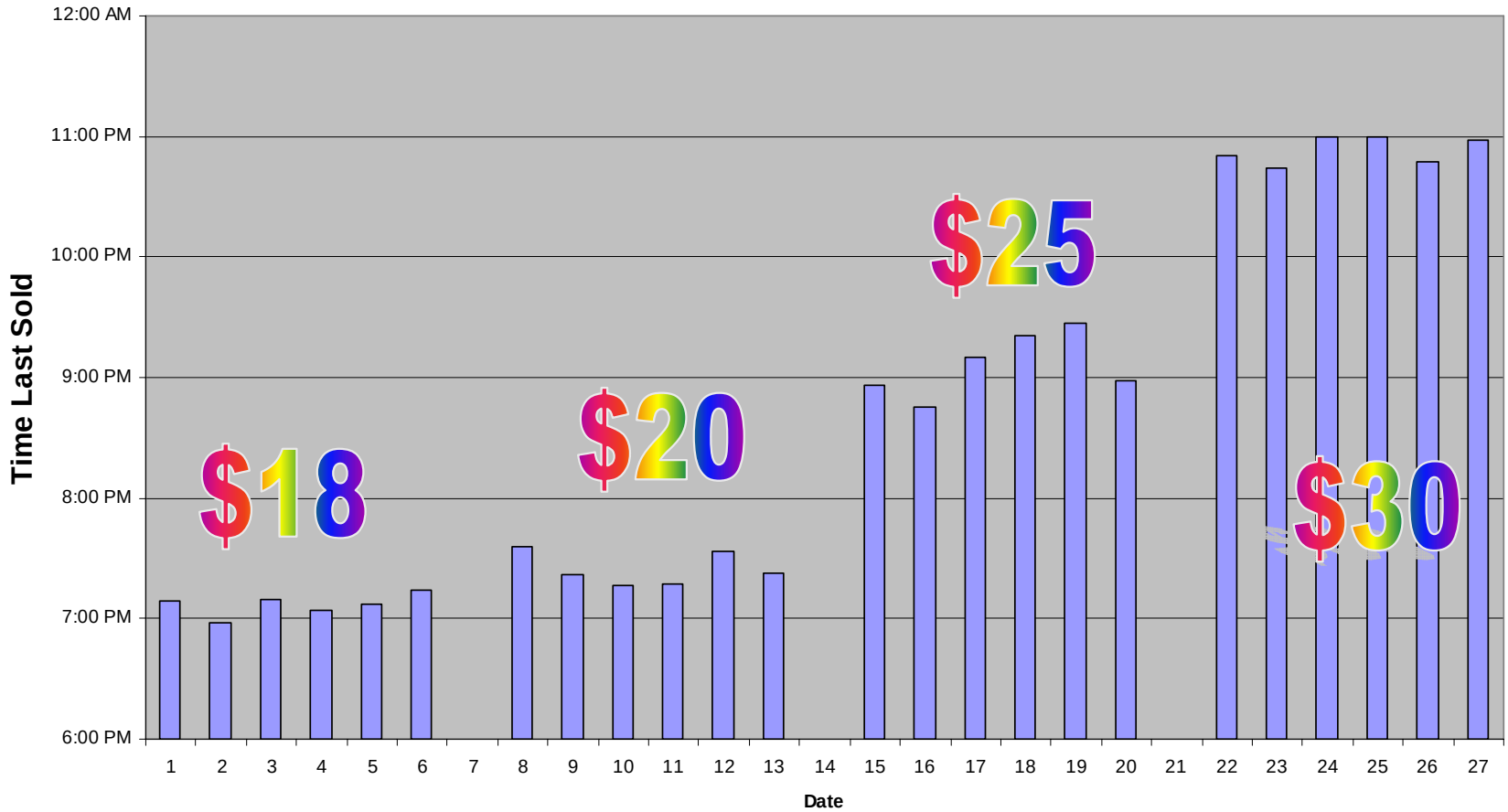
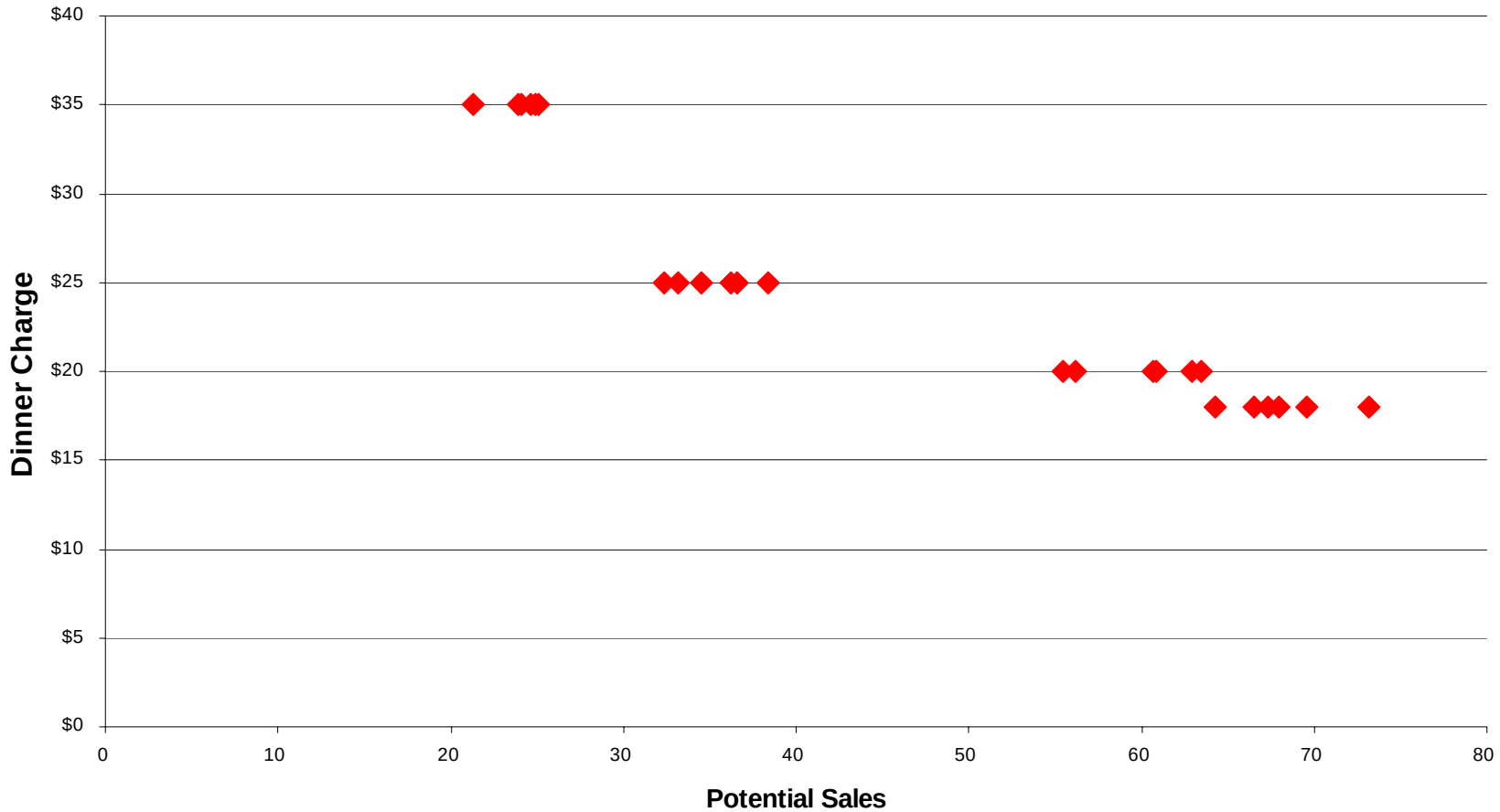


Basil Stuffed Veal Chops

Demand Curve



Market Examples

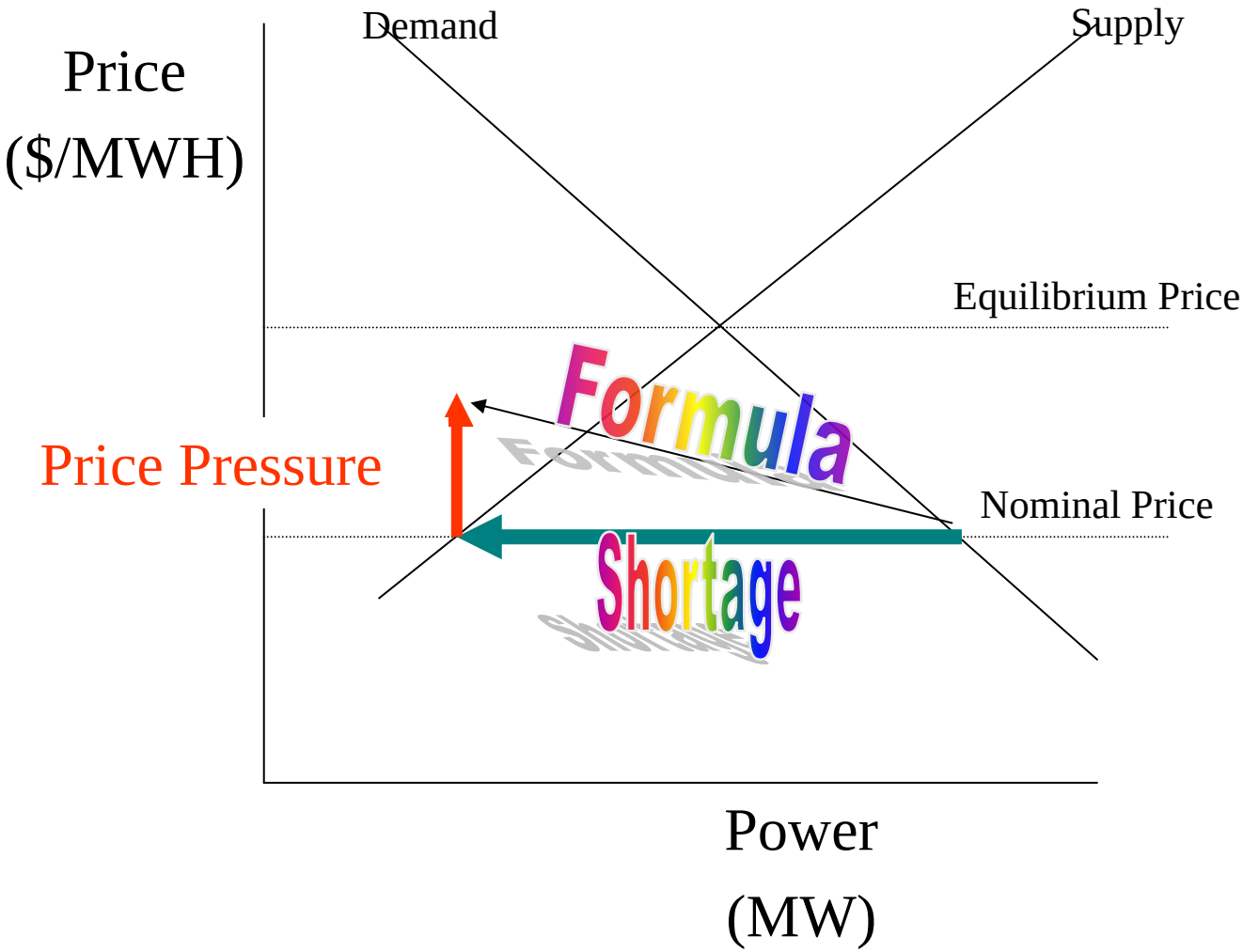
- Cantina D’Italia
- Leon Walras (1834-1910)
- Walrasian Auctions
- Hurricanes Katrina & Rita

Market Theory

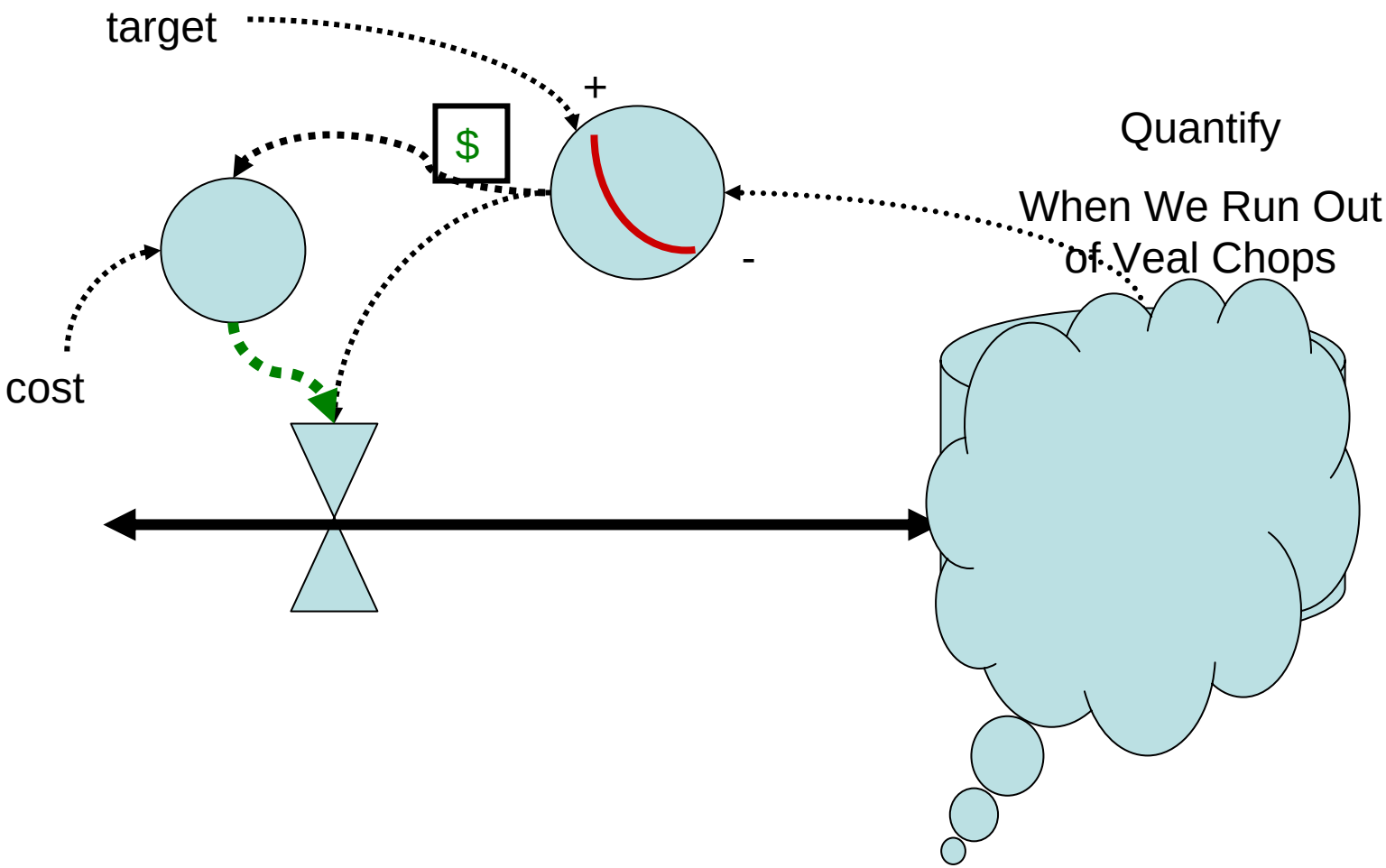
- Supply and Demand
- Feedback Loops
- Quantifying the Quality of Public Goods

Wide Open Load Following

Dynamic Economic Theory



Wide Open Load Following Control Theory



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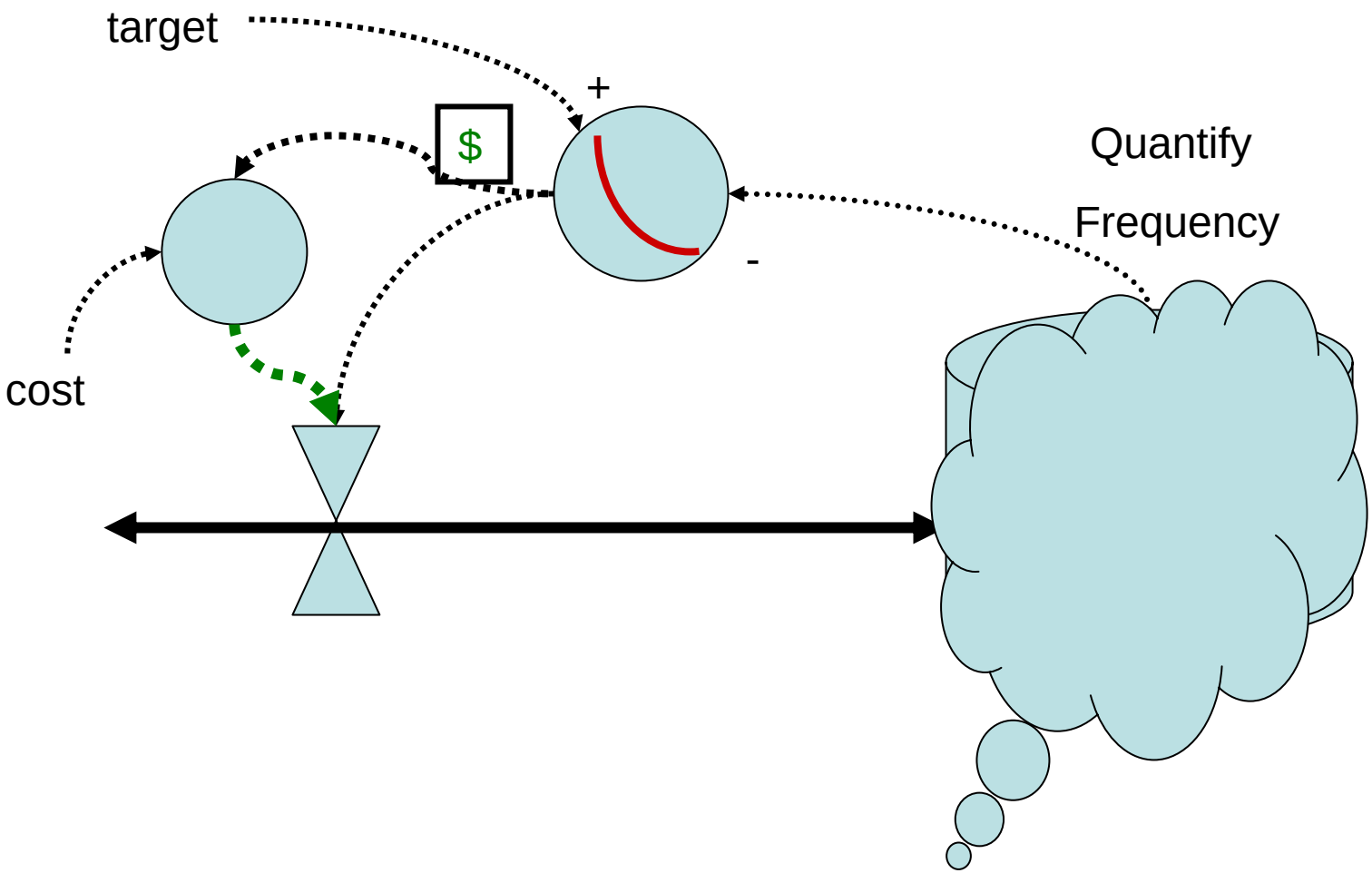

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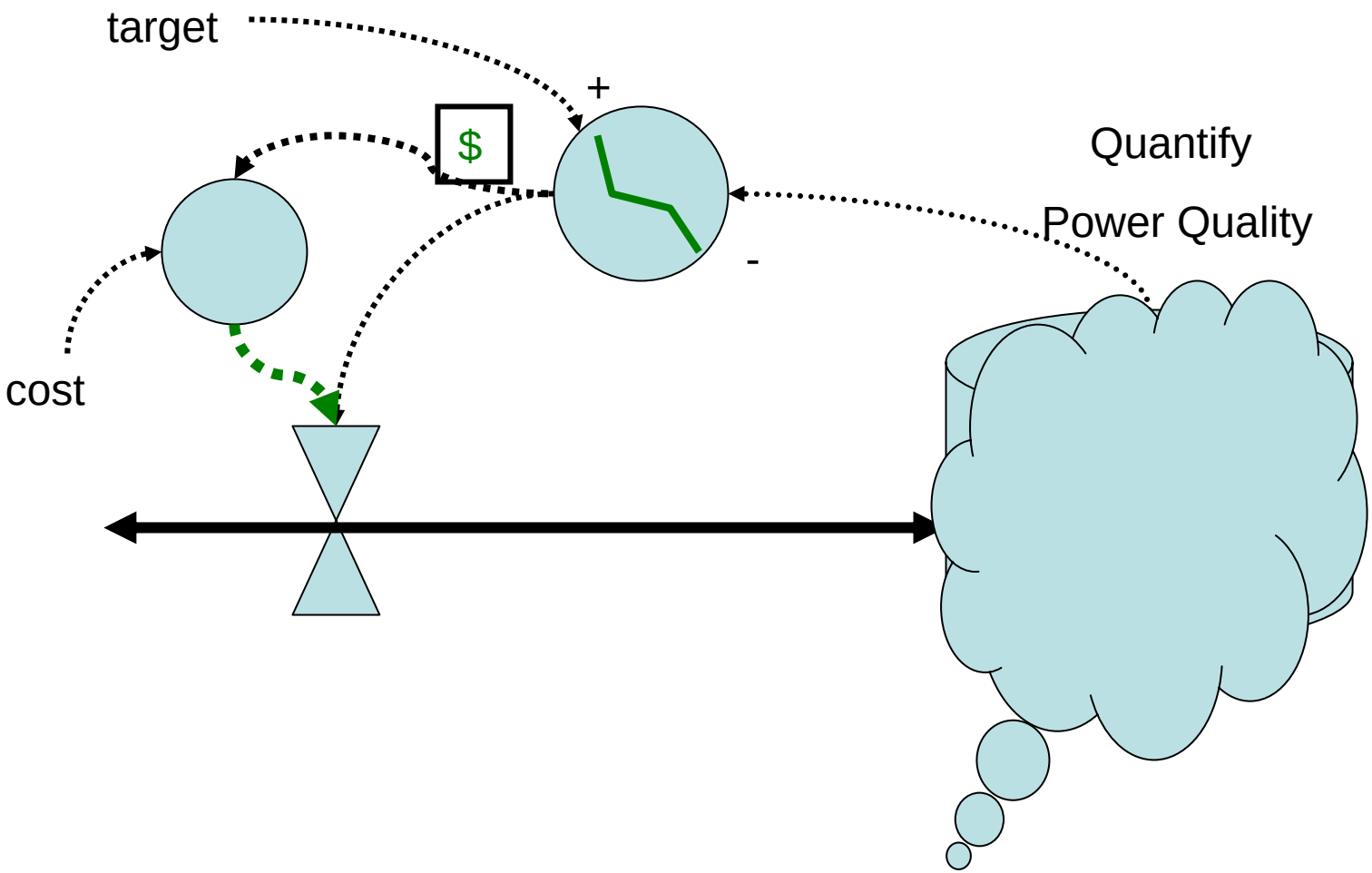

Electric Applications

- Public Goods
  - Frequency/ACE
  - Line Loading
  - Voltage
  - Harmonics
  - Satisfied Diner
- Commodities
  - Energy
  - Location
  - Reactive power
  - Harmonics
  - Veal Chops

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