

Discussion of: Capacity choice, technology mix and market power (by Guy Meunier)

Shmuel S. Oren
UC Berkeley

Economics of Energy Markets Conference
Toulouse, France – January 28-29, 2010

Dynamic Adjustment of Capacity Mix Toward Equilibrium: Example

Generator type	No of units	Unit capacity	Fixed cost	Marginal cost
G1	50	80 MW	\$926,400/Month	\$15/MWh
G2	100	60 MW	\$288,000/Month	\$25/MWh

The demand is characterized by two demand functions for peak and off-peak hours (P=Price, Q=Quantity)

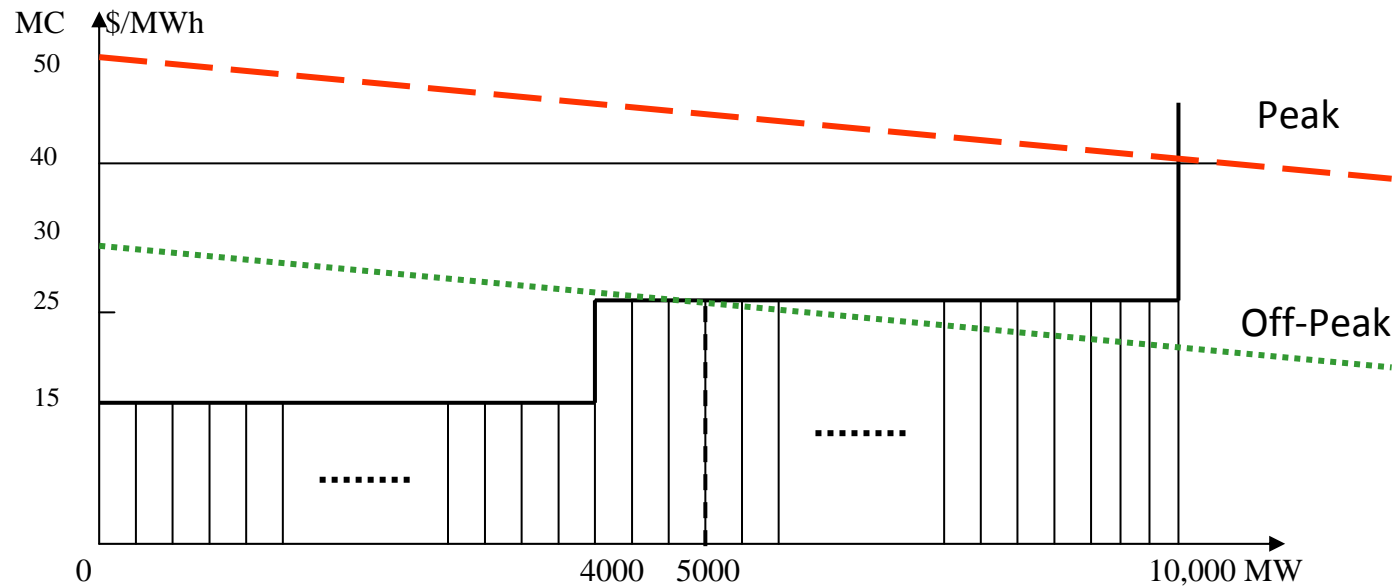
Off-Peak: 420 Hours/Month

$$P=30-Q/1000$$

Peak: 300 Hours/Month

$$P=50-Q/1000$$

Disequilibrium

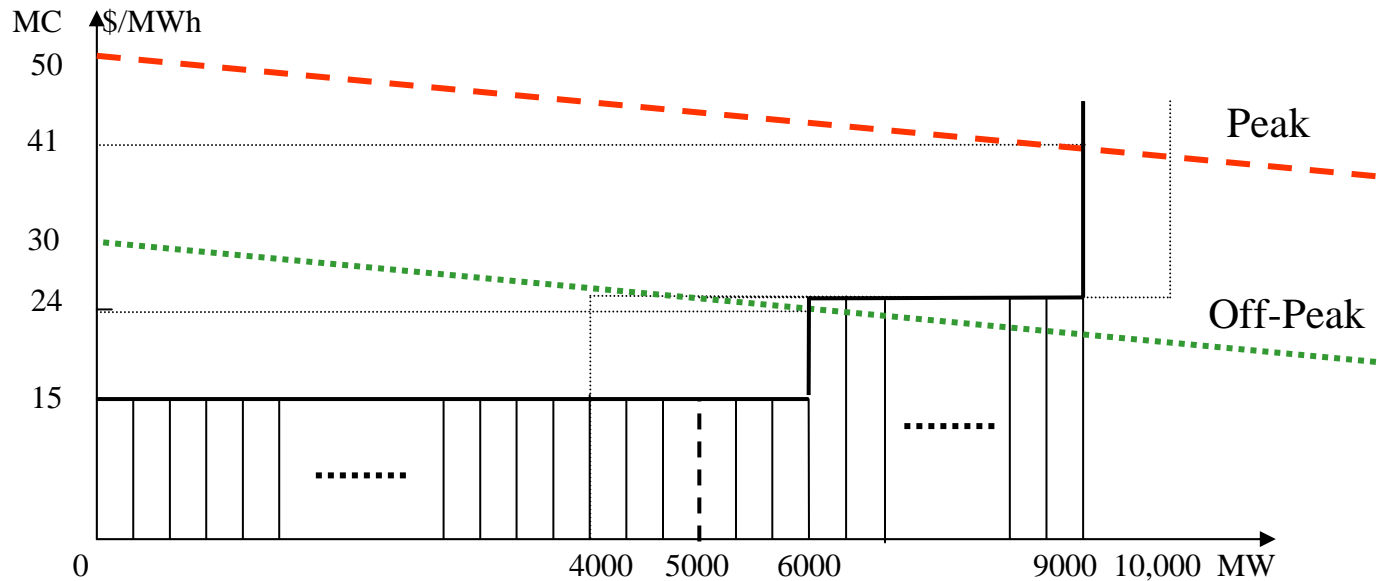


Peak price = \$40/Mwh, Off-Peak price = \$25/MWh

G1: $80 * [(40-15)*300 + (25-15)*420] - 926,400 = \$9600/\text{Month}$ (excess profit)

G2: $60 * (40-25)*300 - 288,000 = (\$18,000/\text{Month})$ (deficit)

Long Run Equilibrium



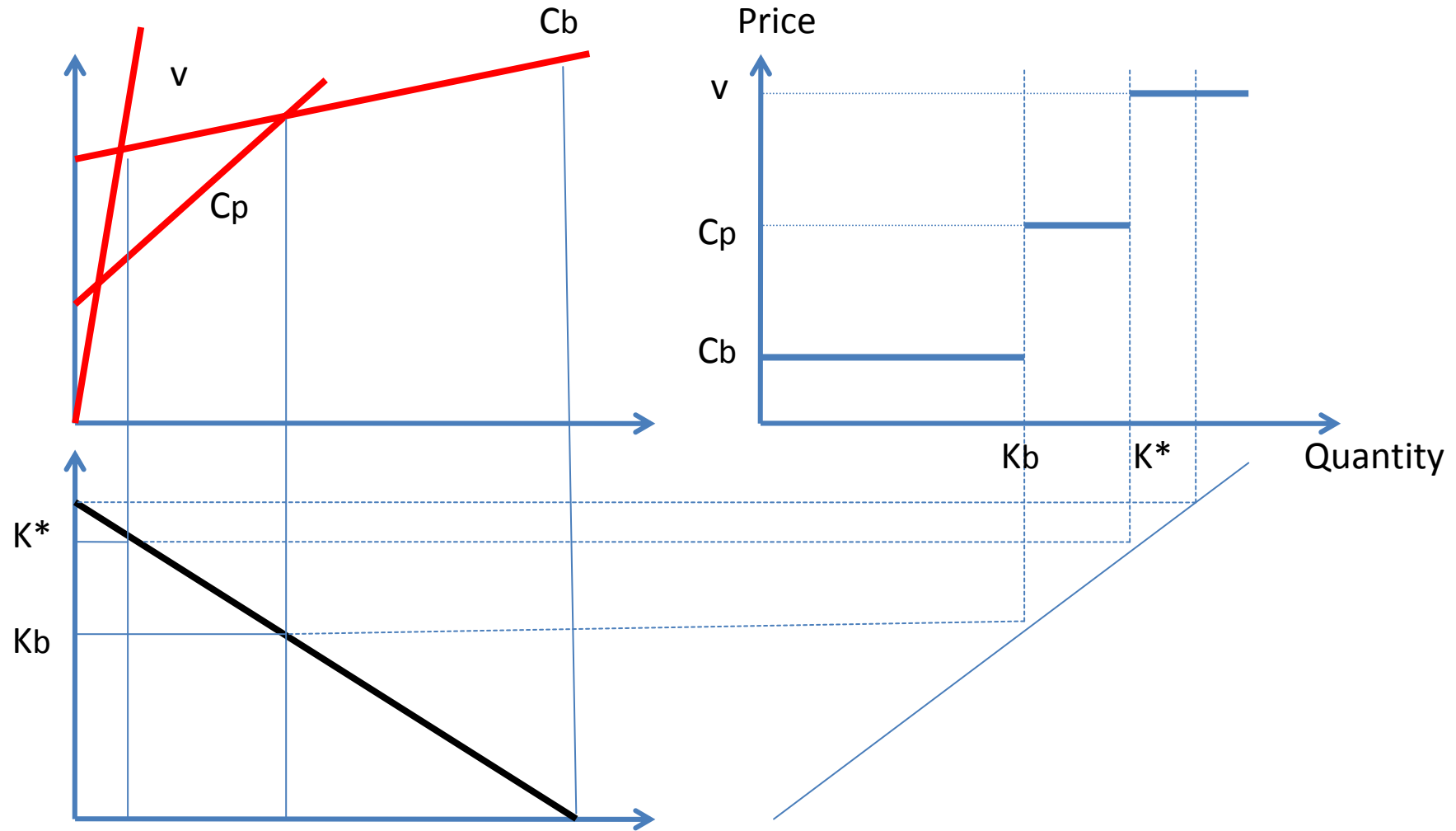
Entry: 2000 MW G1, Exit: 3000 MW G2

Peak price = \$41/Mwh, Off-Peak price = \$24/MWh

G1: $80 * [(41-15) * 300 + (24-15) * 420] - 926,400 = 0$ (Break-even)

G2: $60 * (41-25) * 420 - 288,000 = 0$ (Break even)

Competitive Technology Mix



Model Abstractions

- No market power in energy market
- Lumpiness in capacity (different for technologies)
- Construction lags (different for technologies)
- Uncertain demand growth
- Intermittency of generators (renewables)
- Demand elasticity
- Carbon regulation (differential impact on technologies)