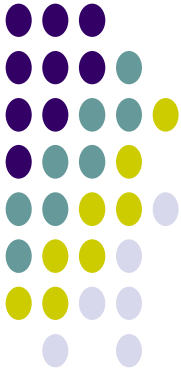




Northeast China Regional Power Market



Han Shui

Northeast China Bureau

State Electricity Regulatory Commission

First Annual Meeting of CAREC Members Electricity

Regulators Forum (CMERF)

Beijing, 5 July 2005

The views expressed herein are those of the author and do not necessarily reflect the views or policies of the Asian Development Bank (ADB), or its Board of Directors or the governments they represent. ADB makes no representation concerning and does not guarantee the source, originality, accuracy, completeness or reliability of any statement, information, data, finding, interpretation, advice, opinion, or view presented.



Outline

- 
1. Northeast Power Industry Status and Planning
 2. Northeast Regional Power Market Framework and its Features
 3. Trial Operation and Development of Northeast Regional Power Market
 4. Lessons and Future Work



1. Northeast Power Industry Status and Planning



- Basic information
- Installed capacity
- Electricity output
- Electricity consumption
- Power grid
- Power price
- The 11th five-year Planning



Basic Information

- **Region: Liaoning, Jilin, and Heilongjiang province; some areas of Eastern Inner Mongolia such as Hulunbeier League, Xingan League, Tongliao City and Chifeng City**
- **Area: 1252.2 thousand sq. km**
- **About 120 mil. service population**
- **In addition to the Northeast Power Grid, 3 small independent 660KV or higher networks in Hulunbeier League, Daxinanling Area, and Yichun Area, are also included in the Northeast Regional Grid.**



Installed capacity

(at the end of 2004)

● Installed capacity: 41490 MW

Thermal power: 35640MW, 85.9% of the total capacity

●●● Hydropower: 5610MW, 13.5%

●●● Wind power: 240MW, 0.6%

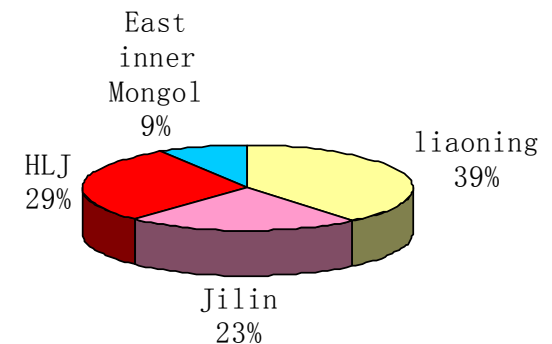
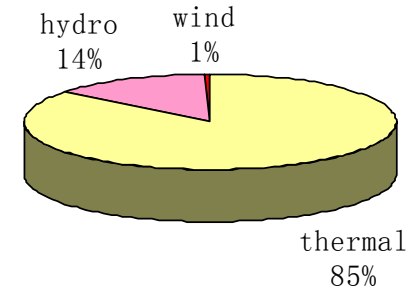
According to administrative division

Liaoning: 16300MW, 39.3% of the total

Jilin: 9430MW, 22.7%

Heilongjiang: 12040MW, 29%

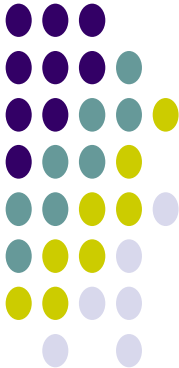
Eastern Inner Mongol : 720MW, 9%



Installed capacity-cont'd

(by the end of 2004)

● According to capacities of company



China Huaneng Group: 5070MW, accounts for 12.2% of the total capacity

DT Group: 2530MW, 6.1%

Huadian Corp.: 5860MW, 14.1%

Guodian Corp.: 3290MW, 7.9%

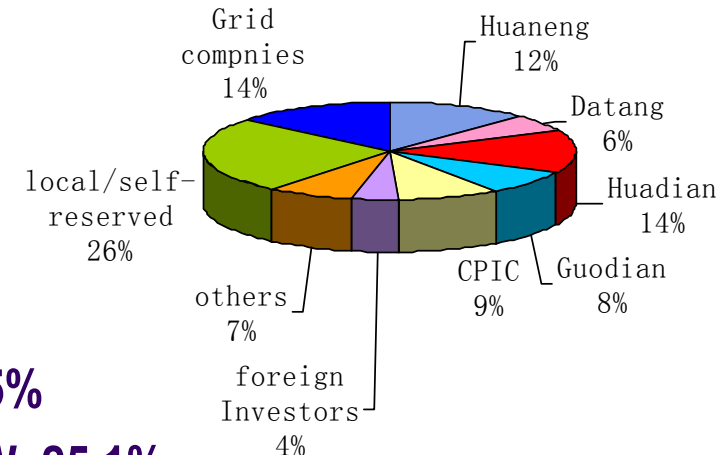
CPIC: 3690MW, 8.9%

Foreign-invested plants : 1750MW, 4.2%

Plants with other investment: 3100MW, 7.5%

Local/self-reserved power plants: 10420MW, 25.1%

Northeast Grid Company owned plants 5780MW, 13.9%



Electricity output

(by the end of 2004)

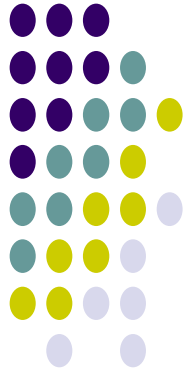
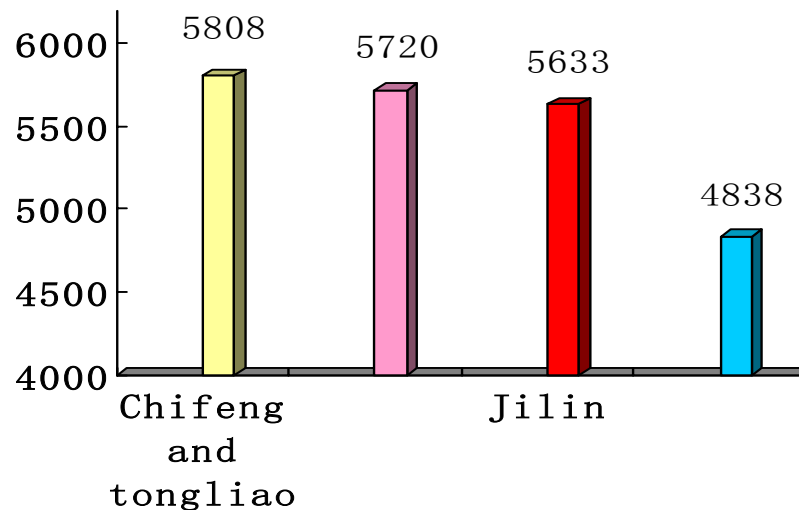
- Total electricity output: 203.2bil kWh
- Peak load: 30.16 mil KW
- Annual utilization hours of thermal capacity: 5439 hrs

Chifeng and Tongliao : 5808 hrs

Liaoning Province: 5720 hrs

Jilin Province: 5633 hrs

Heilongjiang Province: 4838 hrs



Electricity Consumption(2004)

- Electricity consumption was 199.4 bil kWh in 2004, a year-on-year increase of 10.37%, of which:

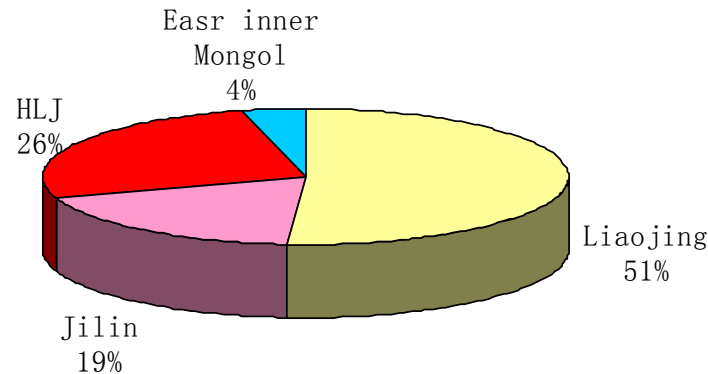
Liaoning: 102 bil kWh, an increase of 12.32%

Jilin: 37.2 bil kWh, an increase of 9.77%

HLJ: 52.5bil kWh, an increase of 6.5%

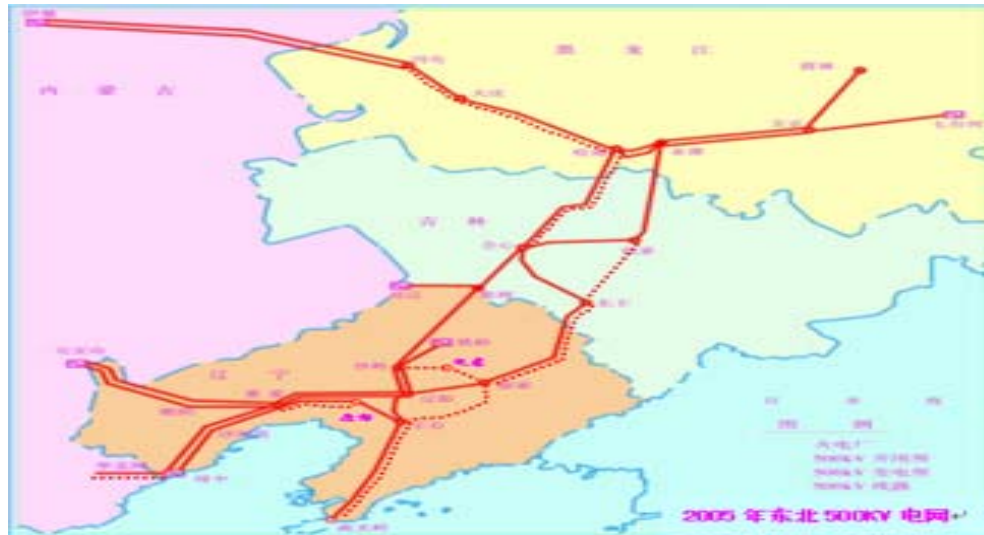
Eastern inner Mongol : 7.7bil kWh, an increase of 14%

Since 2004, power demand and supply across the region has reached a basic balance, though shortage appears in some areas

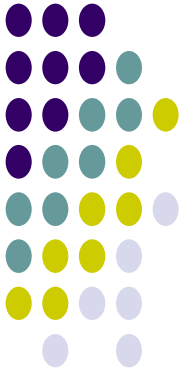
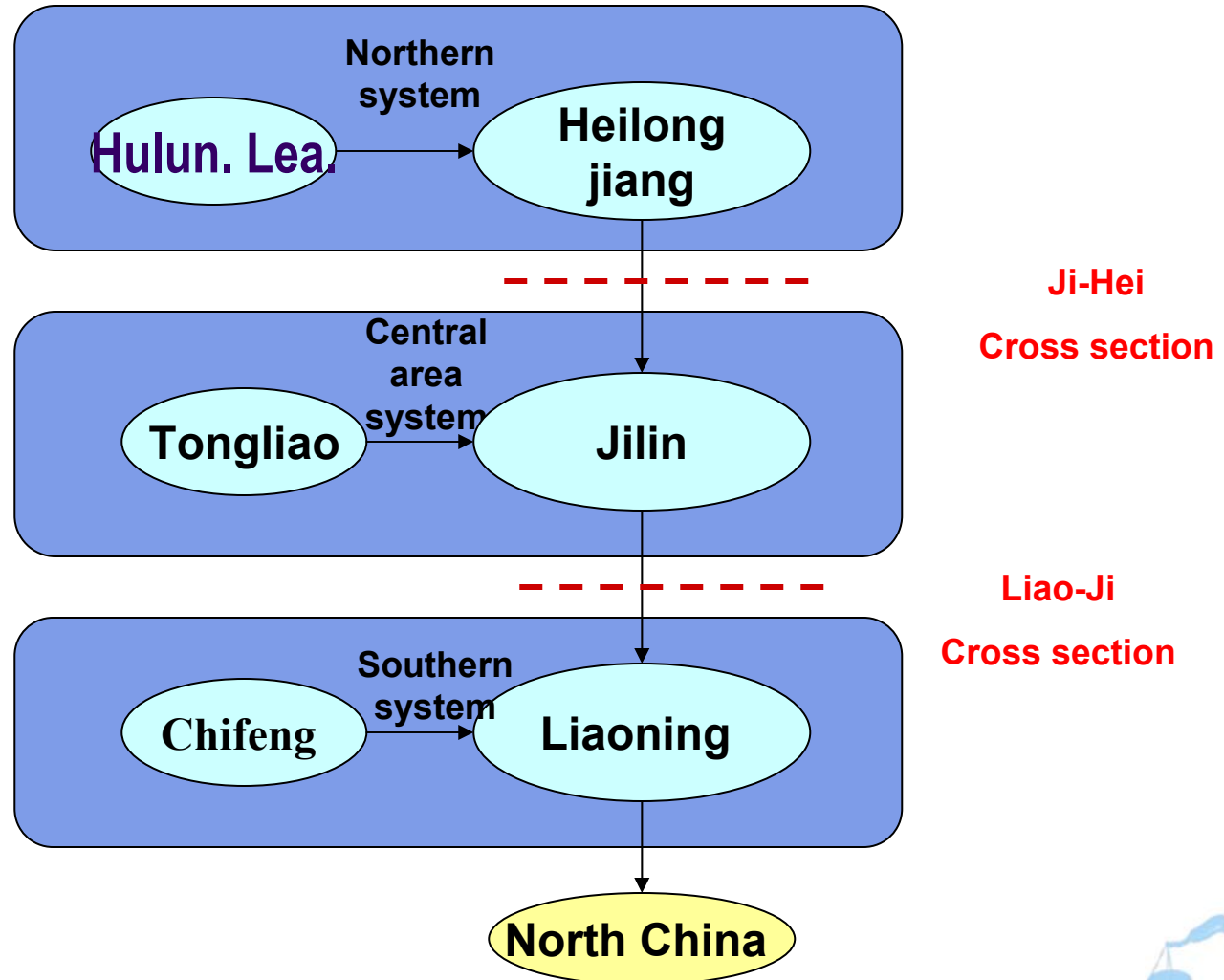


Power Grid

- 18 substations of 500KV, with the total capacity of 16.81 mil KVA
- 39 lines of 500kv, with the total length of 5,786km
- 233 substations of 220kv, with the total capacity of 46.88 mil KVA
- 533 lines of 220kv, with the total length of 24,998km



Power Grid – cont'd

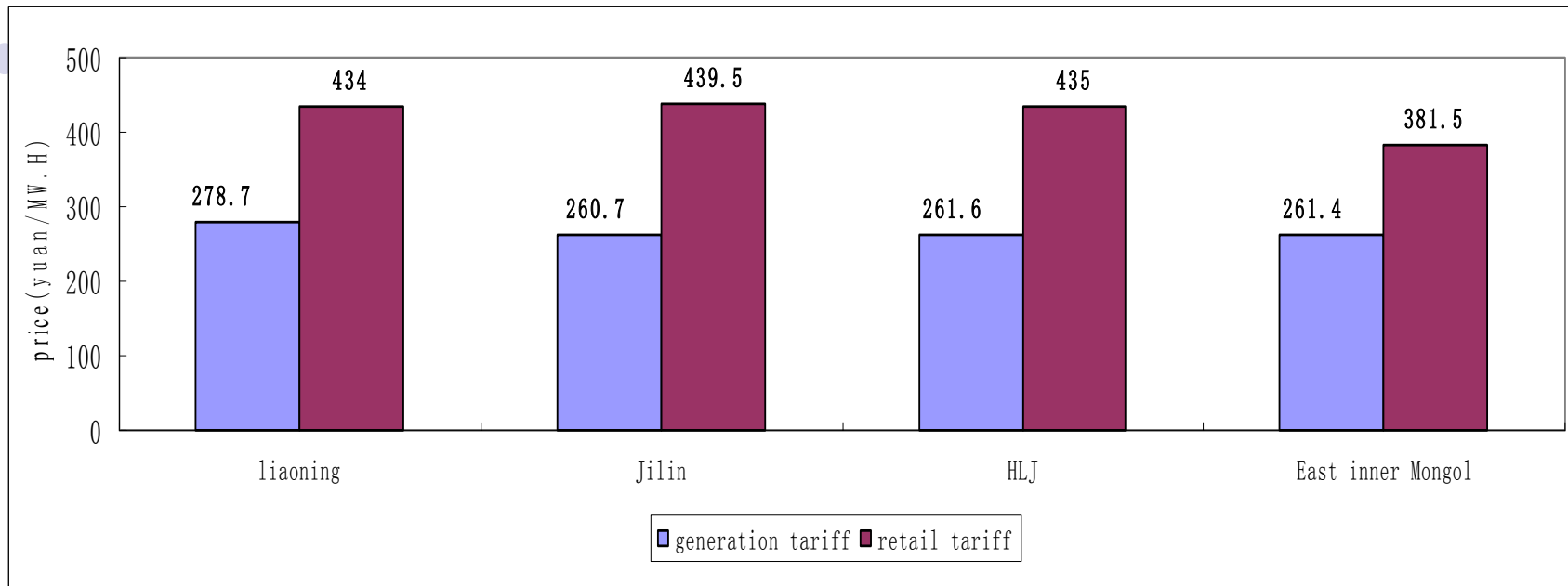


Tariff Level

(by the end of 2004)

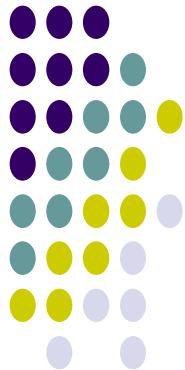
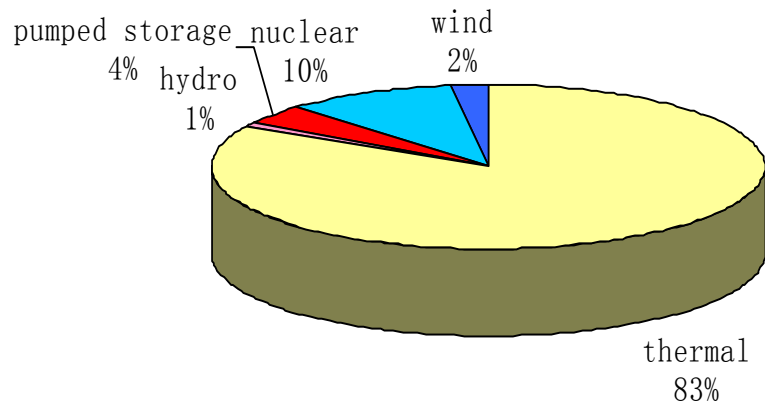
Unit: RMB yuan/1000 kwh

	Liaoning	Jilin	HLJ	Eastern inner Mongol
Average retail tariff	434	439.5	435	381.5
Generation tariff	278.7	260.69	261.61	261.42



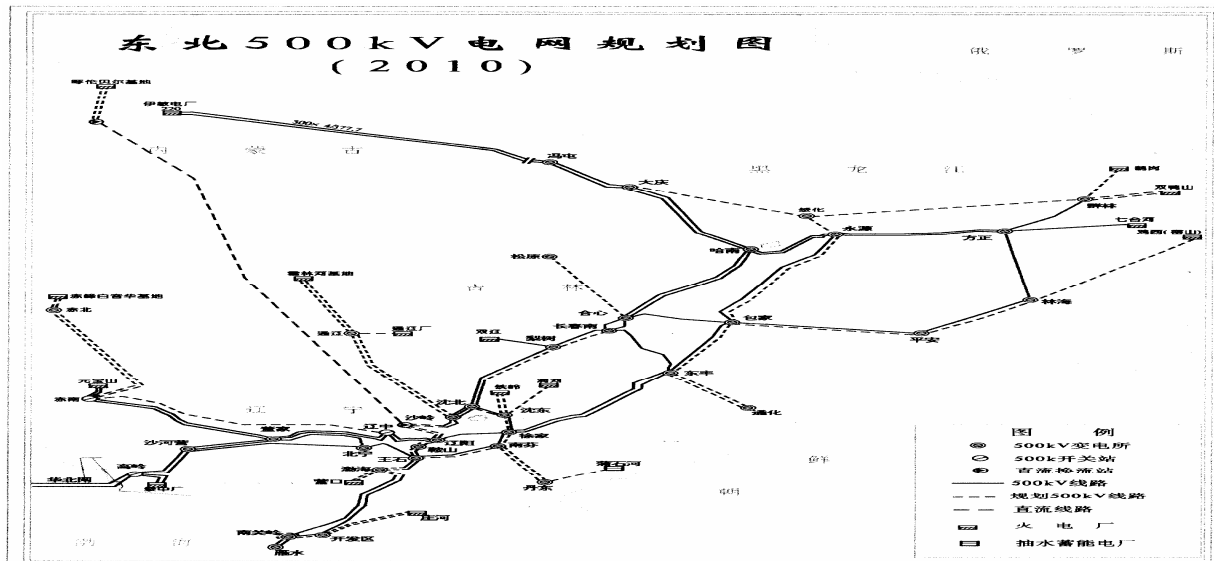
11th Five-Year Planning (generation)

- Construction scale 20.32GW
- Thermal power 16.94GW 83.4%
- Hydropower 0.10GW 0.5%
- Pumped storage station 0.8GW 3.9%
- Nuclear power 2GW 9.8%
- Wind power 0.48GW 2.4%。



11th Five-Year Planning (power grid)

- Construct 2 transmission lines of 500KV from Jilin to HLJ (total of 6 loops)
- Construct 1 transmission line of 500KV from Liaoning to Jilin (total of 5 loops)
- Construct 500KV lines from Huolin River to the load center of Liaoning
- Form a 500KV loop-net in main load center



2. Northeast Regional Power Market Designs and Features



- Preliminary goals
- Mid-term goals
- Long-term goals
- Early market designs
- Market features



Preliminary Goals

- Establish preliminary trading system and market regulation mechanism in the northeastern regional power market
- Set up a uniform regional power market with the Northeast Power Dispatching Center as its trading platform
- Establish a bidding model of two-part tariff with all electricity ? participating in the competition
- Open access to generation market at the right time
- Carry out experiments on bilateral trading between generators and large consumers
- Establish compensation mechanism for auxiliary services



Mid-Term Goals

- Establish an auxiliary service market
- Extend the range of generation competitors
- Establish bilateral trading between generators and major consumers
- Undertake study on experiments of bilateral trading between generators and independent distribution companies
- Introduce environmental discount factors in the bidding process after the central government issues the discount standards for discharge of pollutants



Long-Term Goals



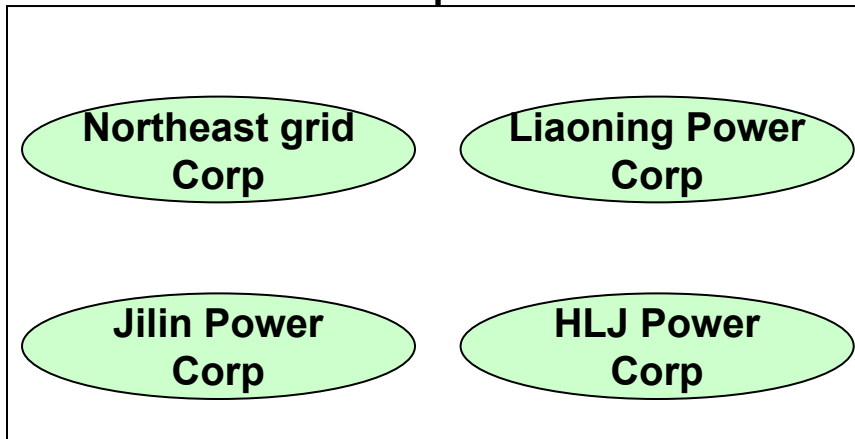
- Introduce retail competition
- Make all market entities to participate in all-round competition
- Introduce power futures or market options
- Establish a credit market of generating capacity to determine the generation tariff determined by competition



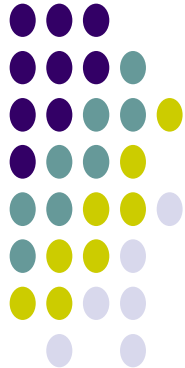
Market participants

Power grid companies

Generation companies



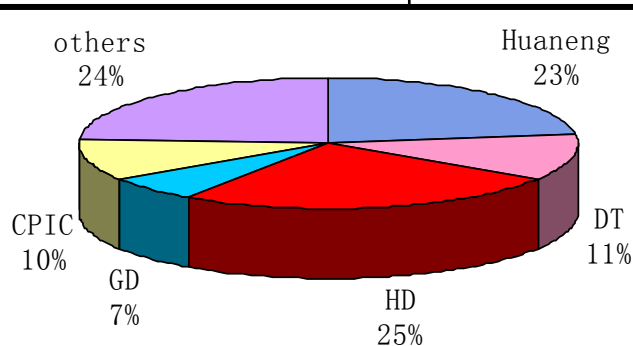
100MW or higher thermal power plants
(excluding CHP plants and self-used plants)



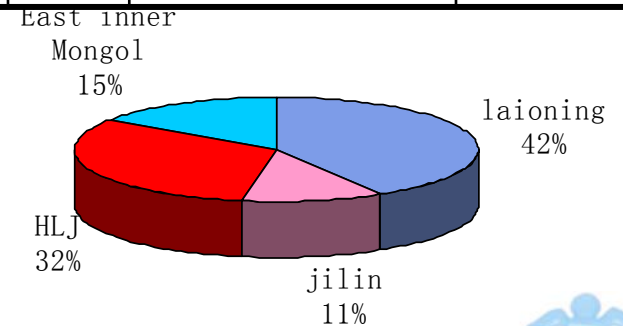
Market participants—cont'd

	HN	Guodian	Huadian	DT	CPIC	Others	Total
companies (number)	7	4	5	4	3	6	29
capacity (10MW)	490	242	542	140	220	510	2144

	Liaoning	Jilin	HLJ	East inner Mongol	Total
generators (number)	10	6	9	4	29
capacity (10MW)	890	240	684	330	2144



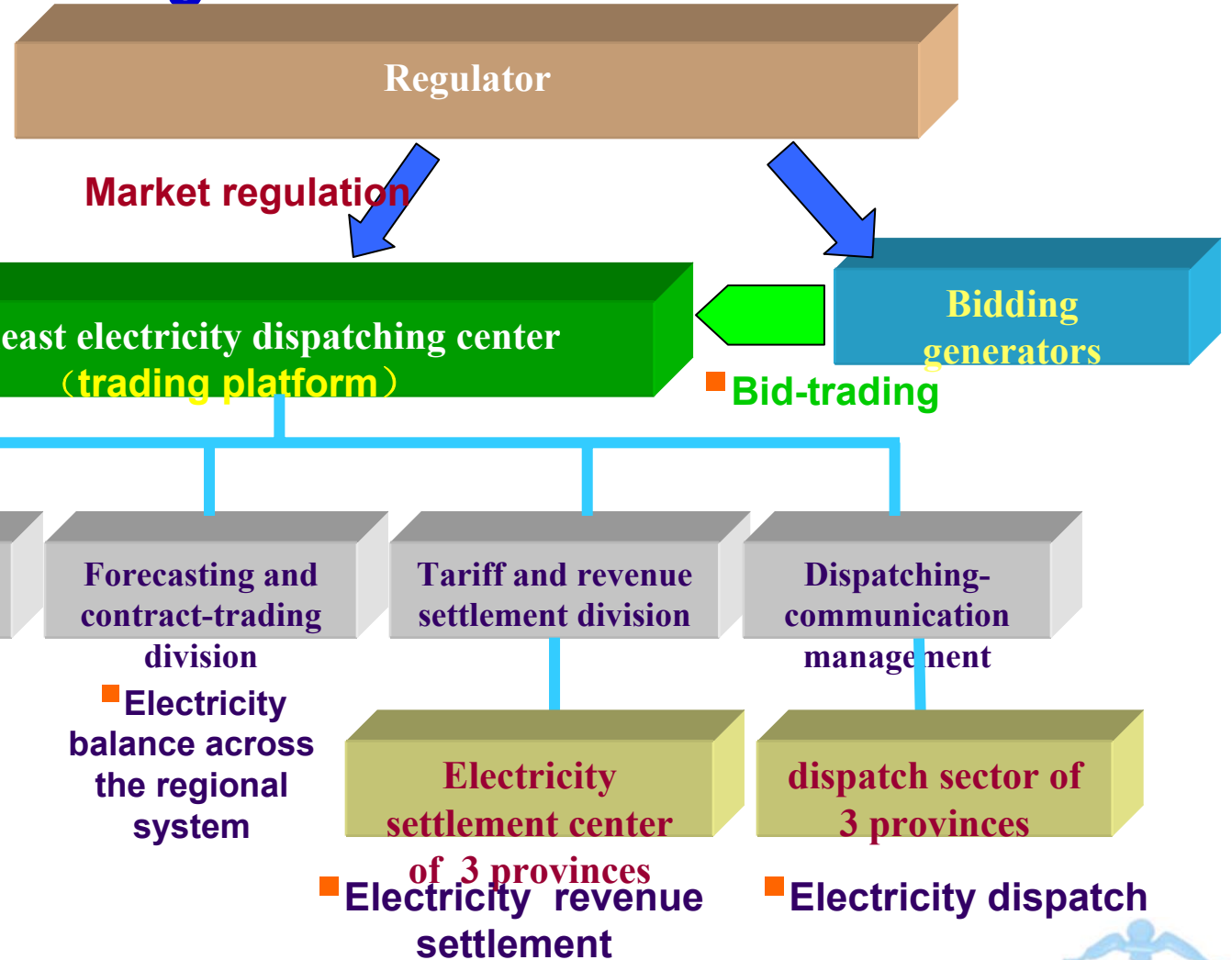
According to company portion



According to province/region portion

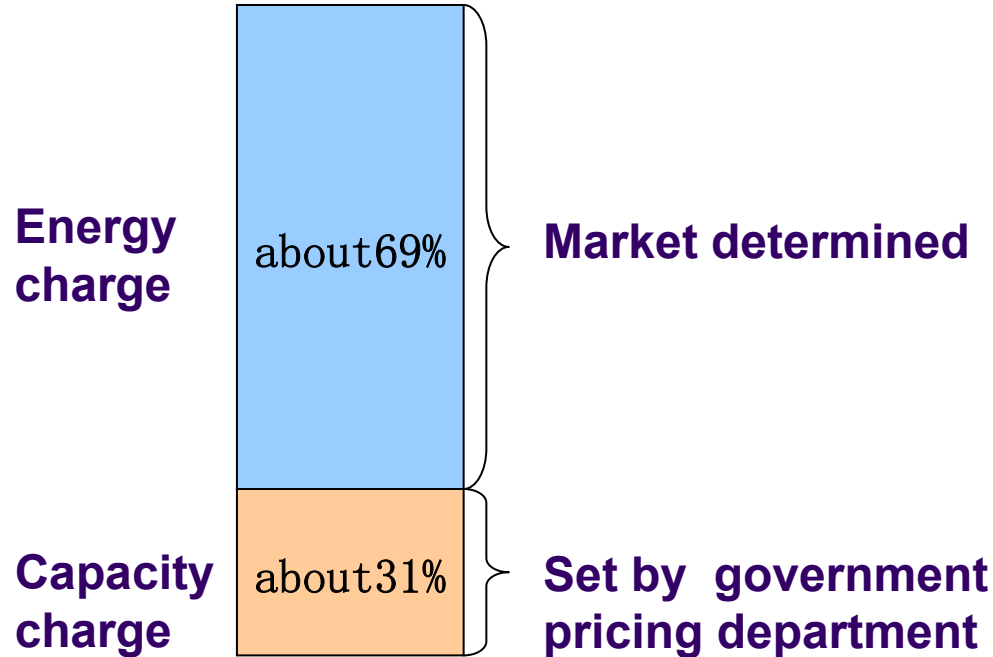


Organization



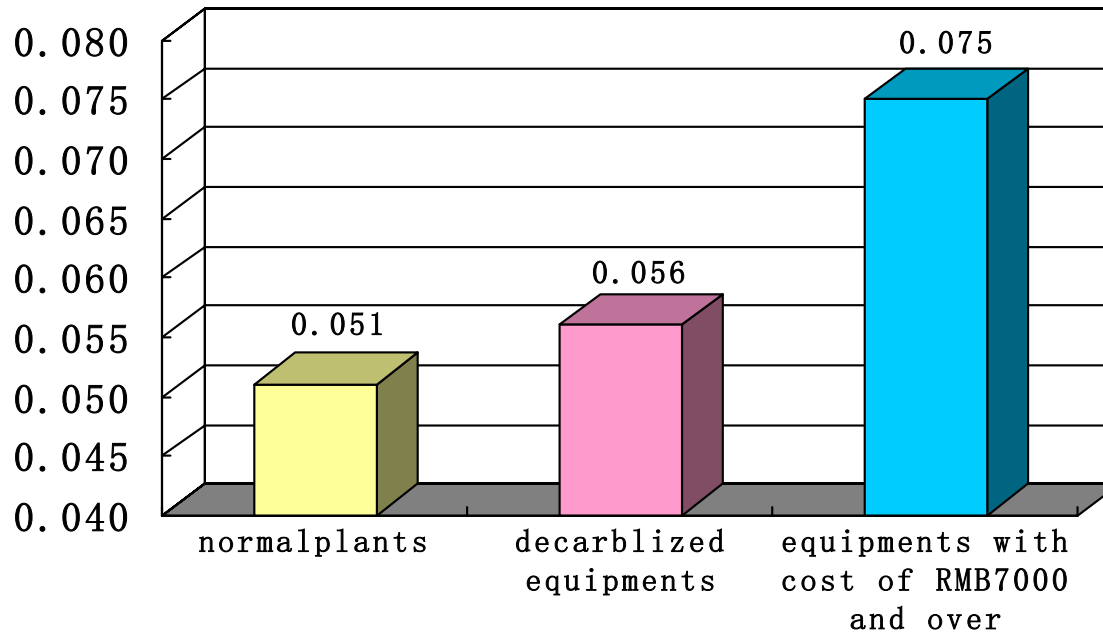
Tariff Structure

Two-part generation tariff



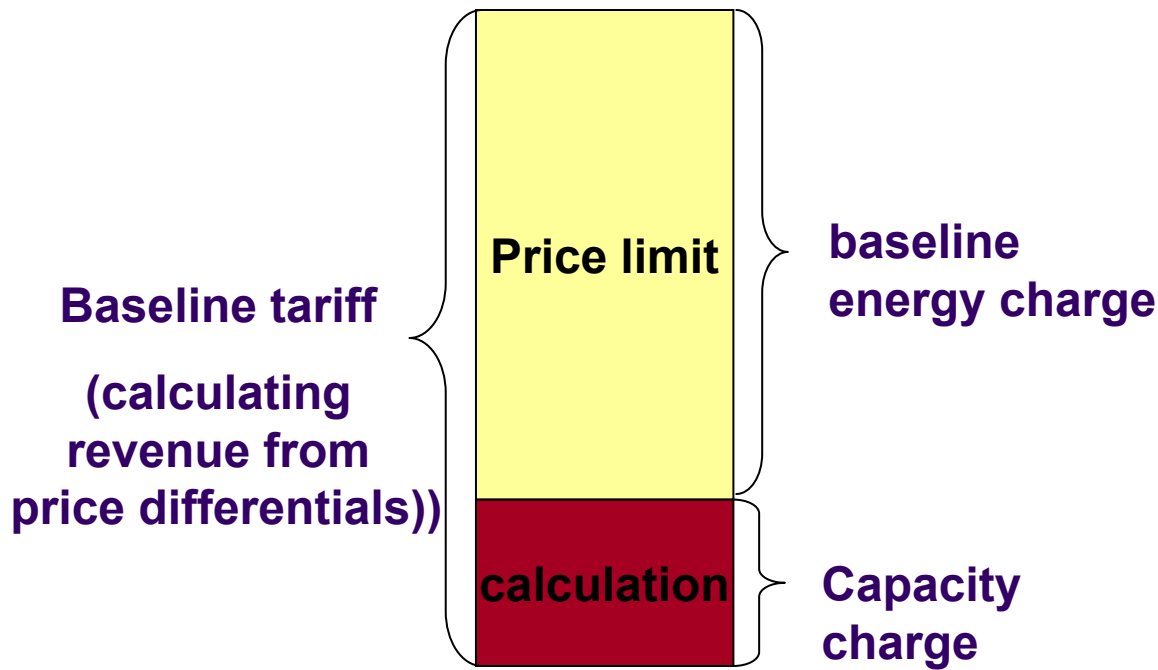
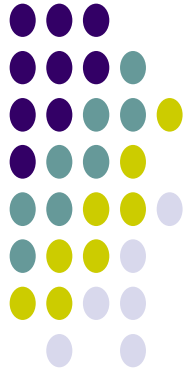
Capacity charge

Capacity charge = $K \times (\text{Depreciation charge} + \text{financial expenses}) / \text{available capacity} \times \text{annual utilization hours}$

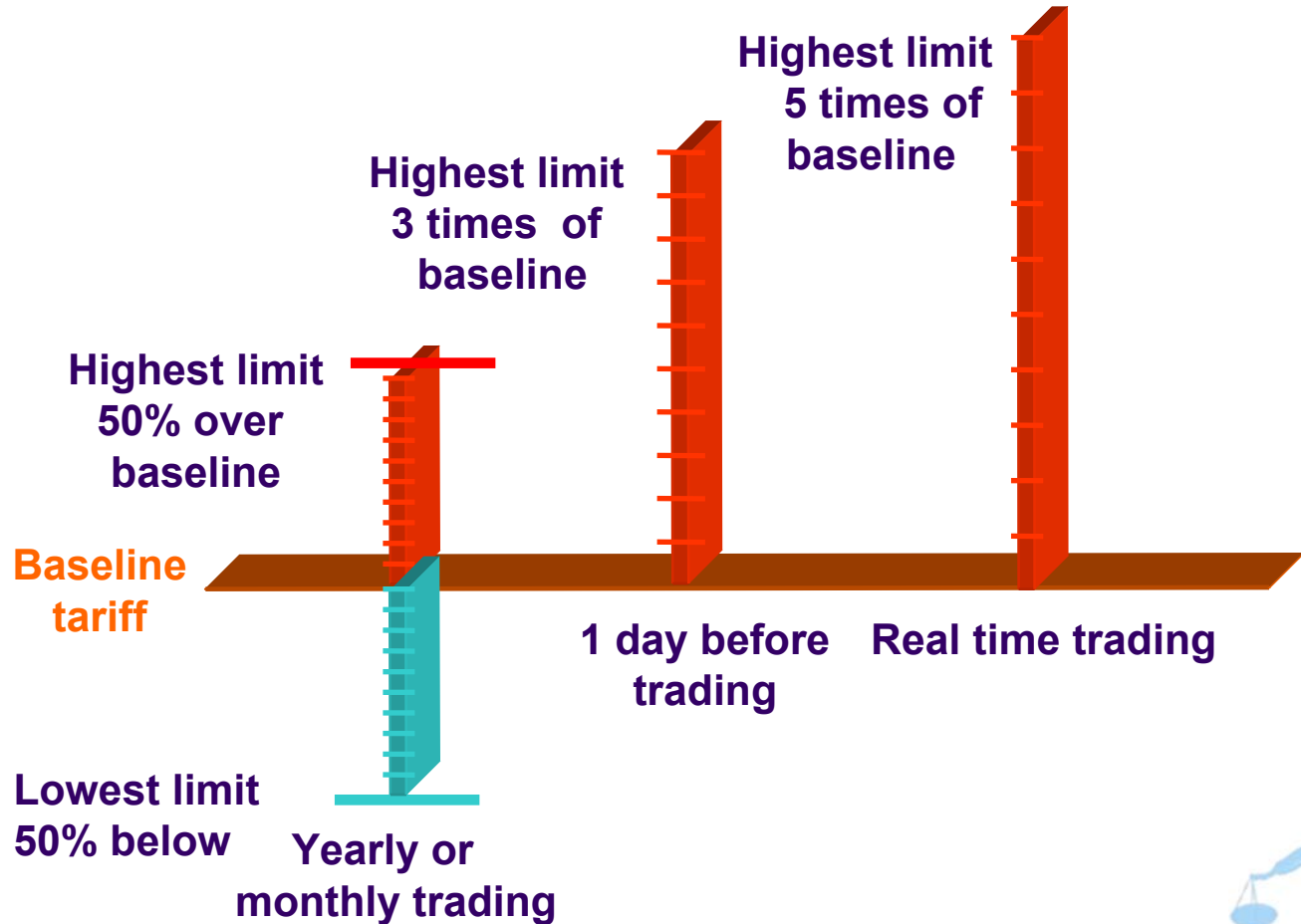


Basic tariff

Take average generation tariff of bidding plants in base year as baseline, considering country's price adjustment and deduction of electricity sent to North China

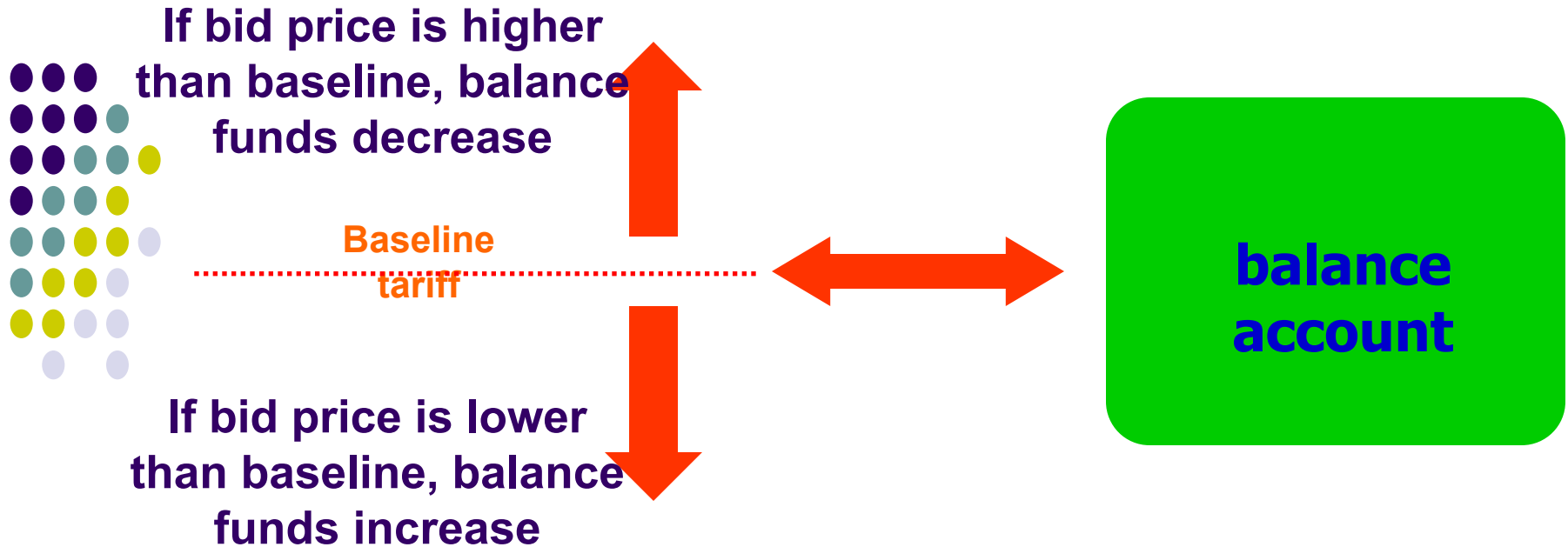


Price limit scheme



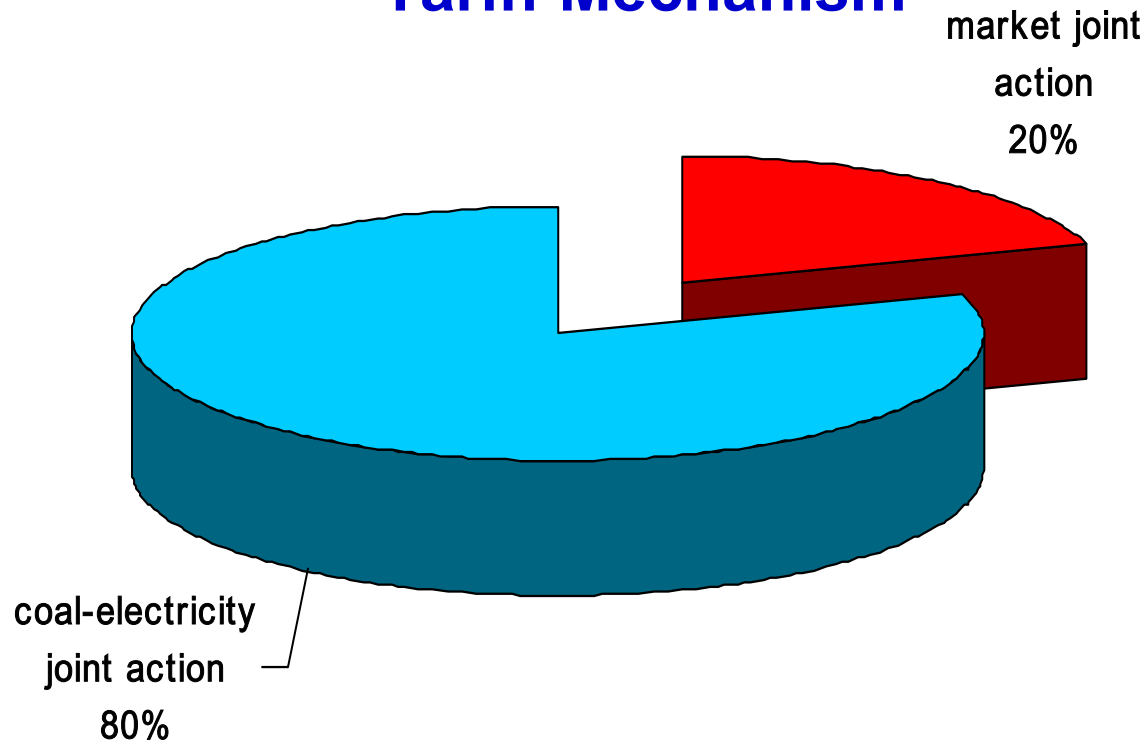
Early Market Designs

Balance account

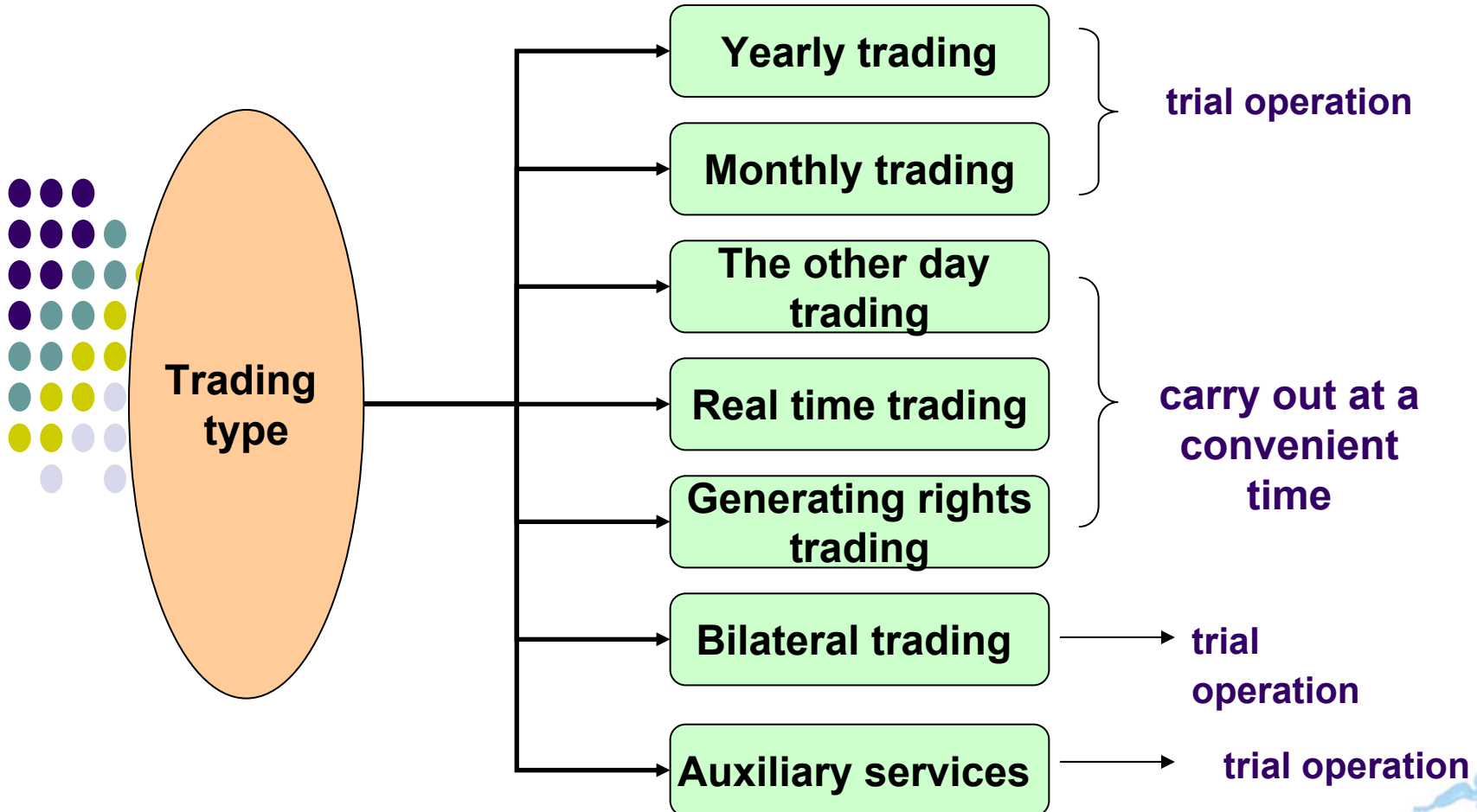


“Electricity-Respond-to-Coal”

Tariff Mechanism

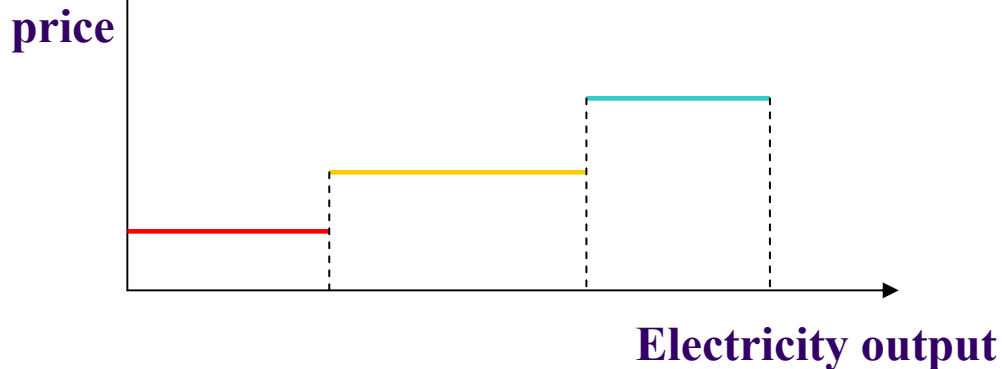
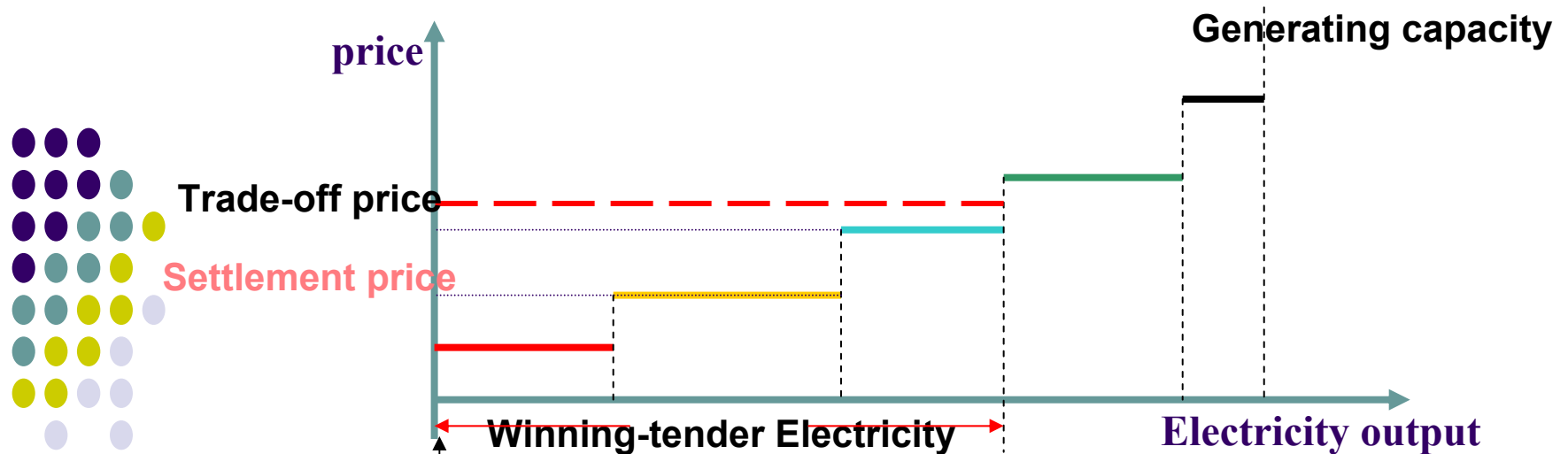


Trading Pattern

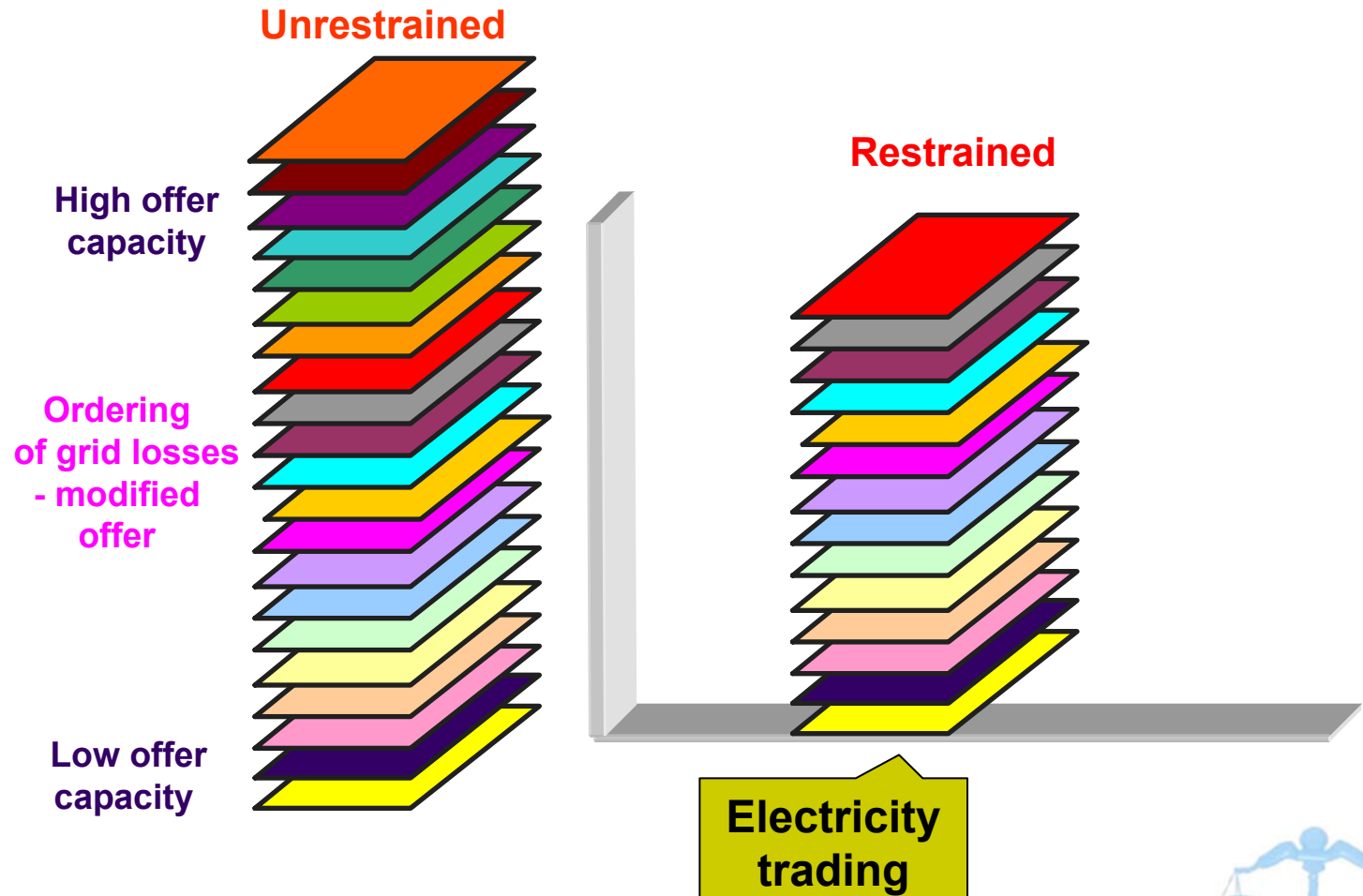


Offering in phases

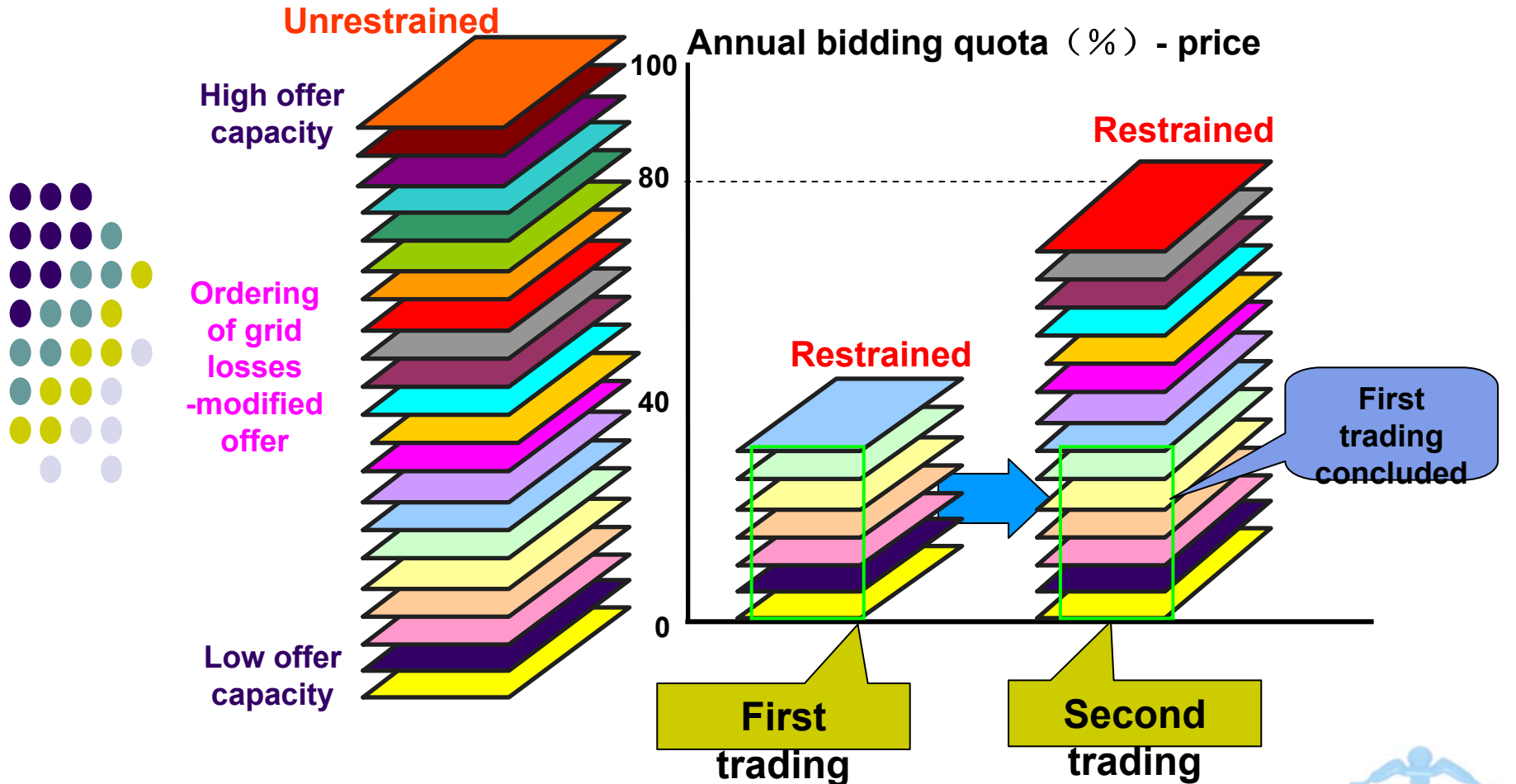
5 phases per year and 3 phases per month



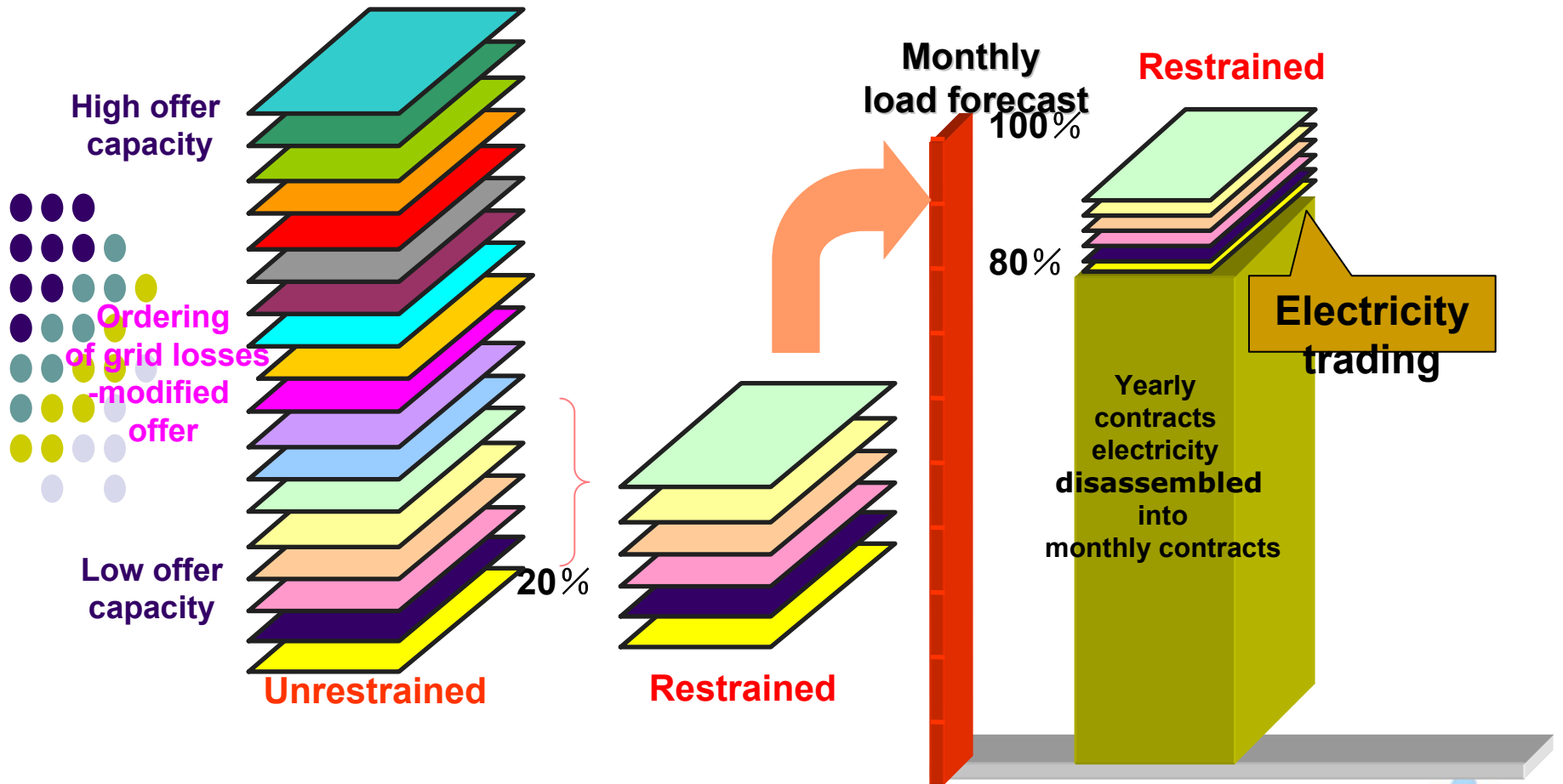
Electricity Trading Principles



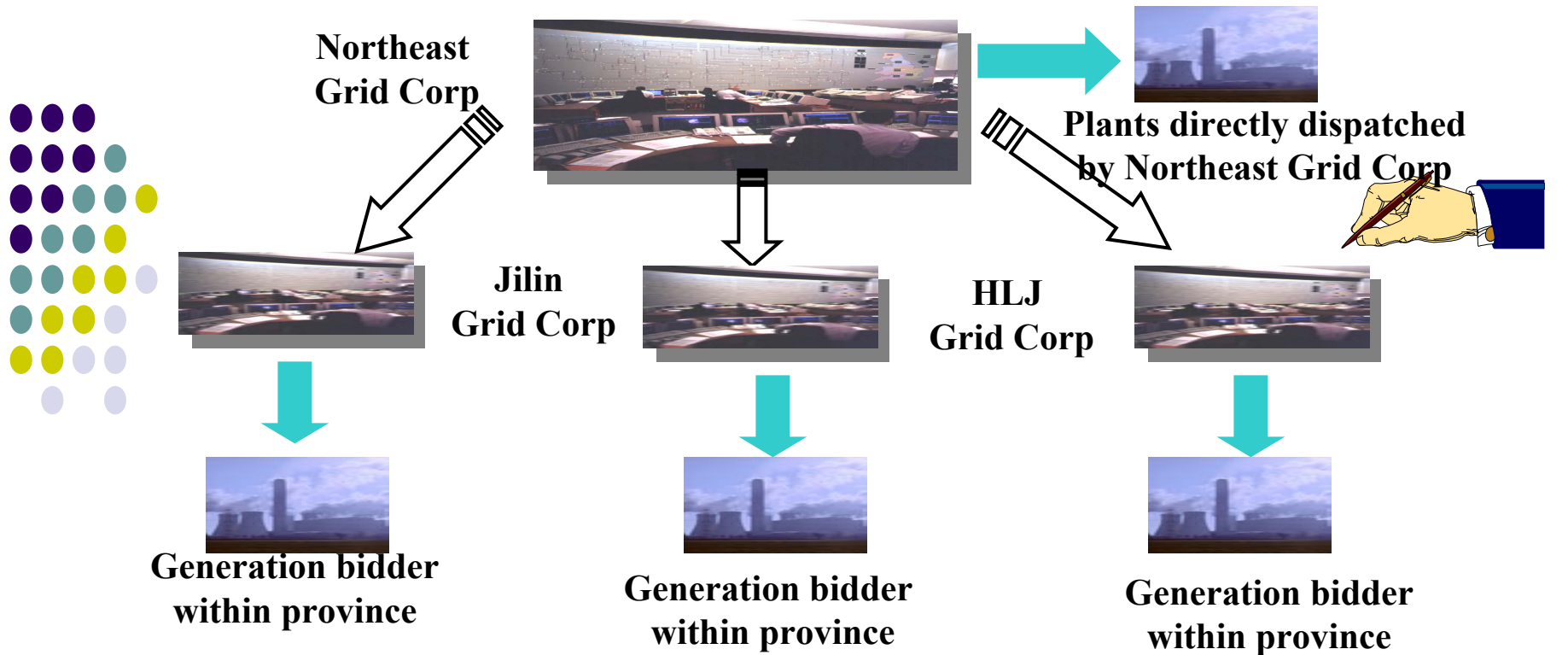
Annual trading



Monthly Trading

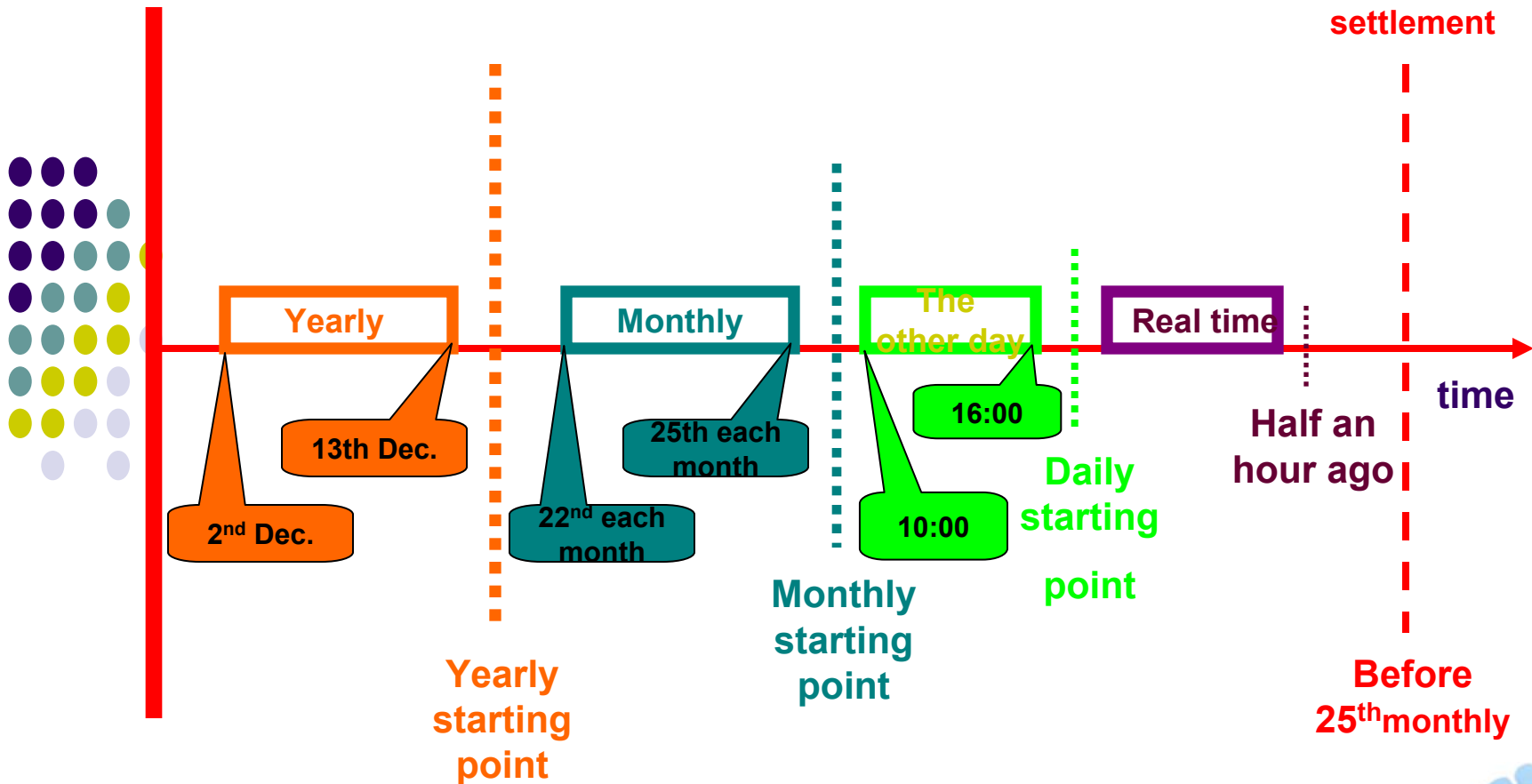


Signing Annual Contracts

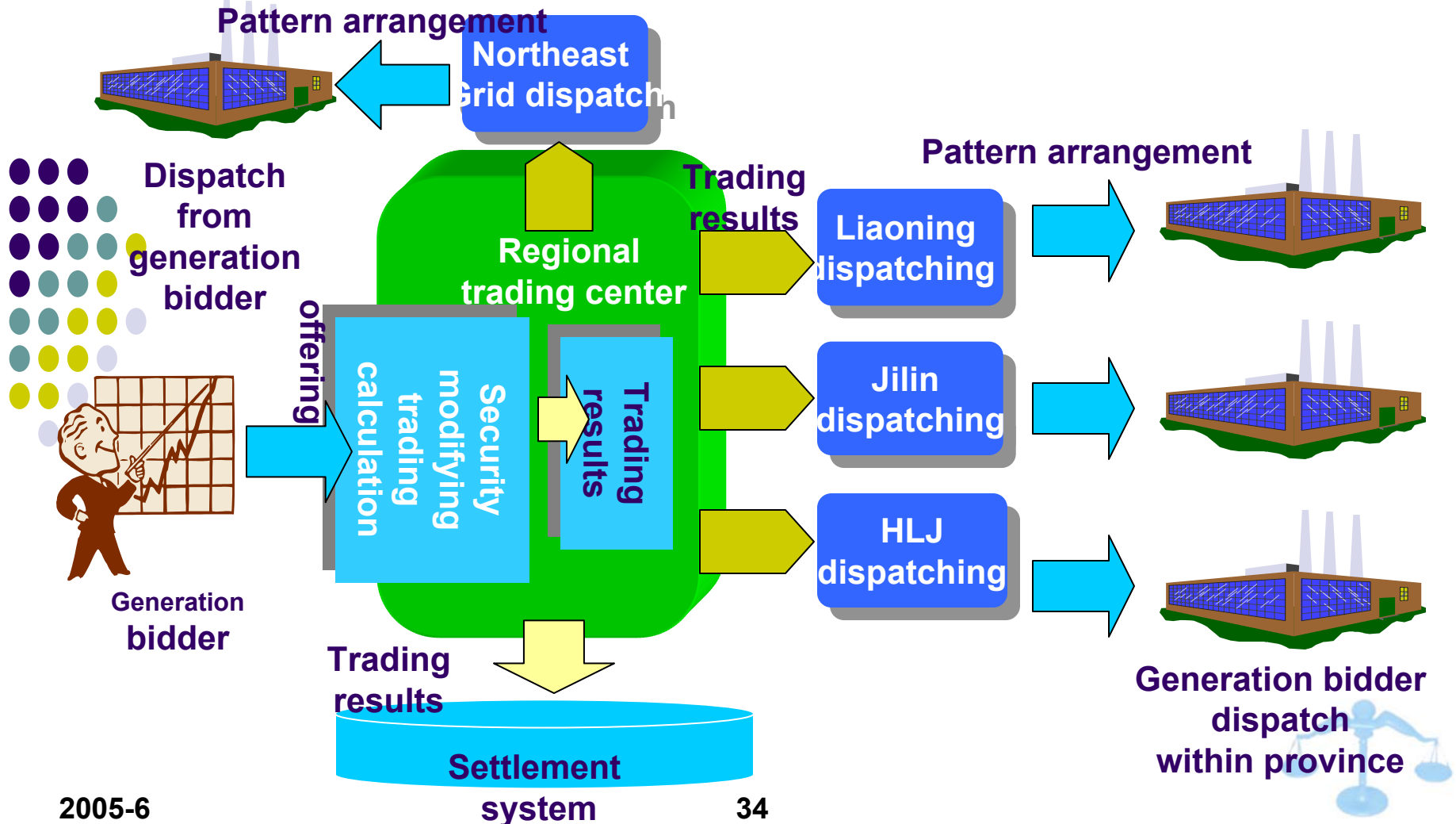


Trading Time Ordering

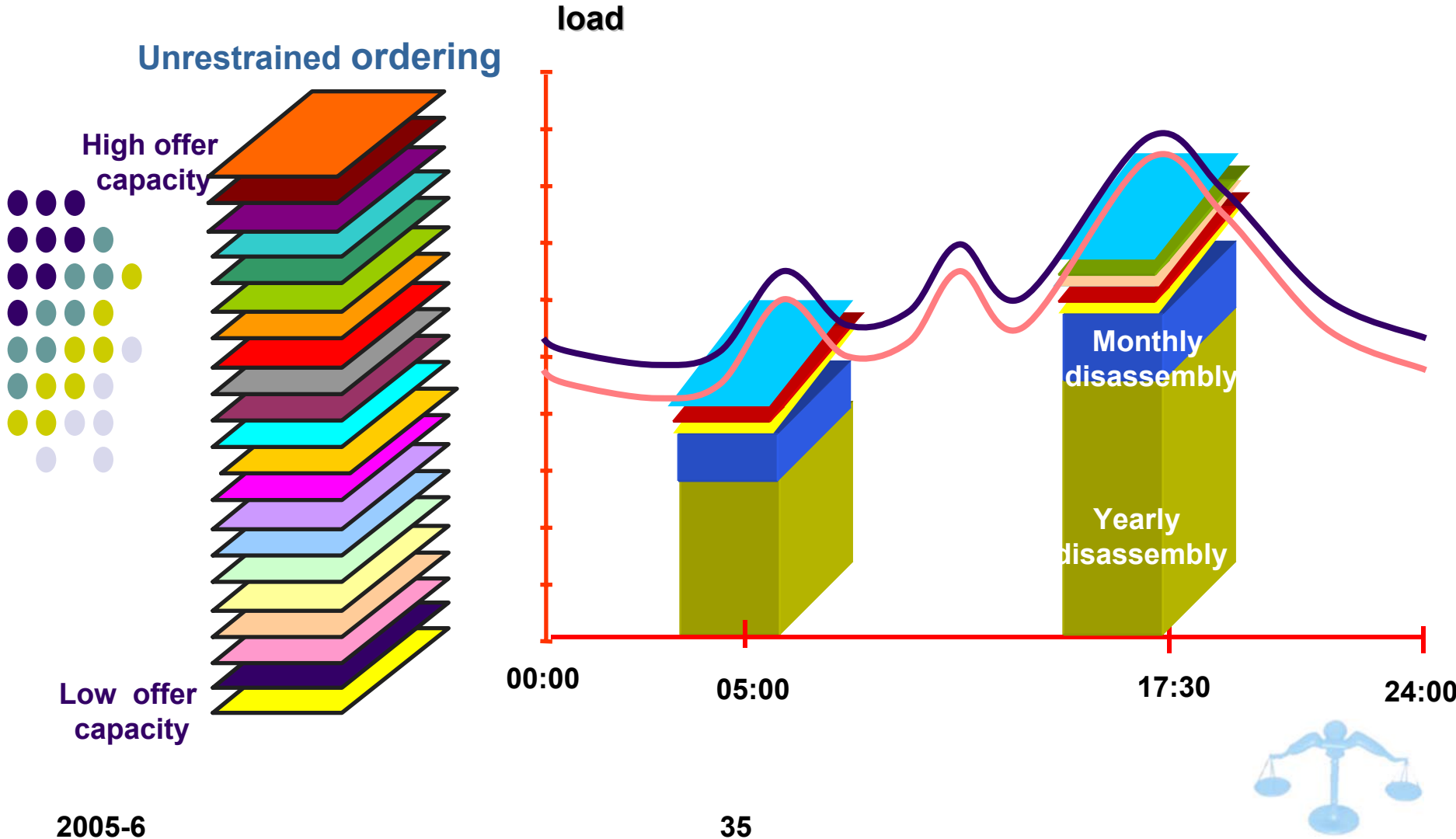
Trading time ordering



Trading Process

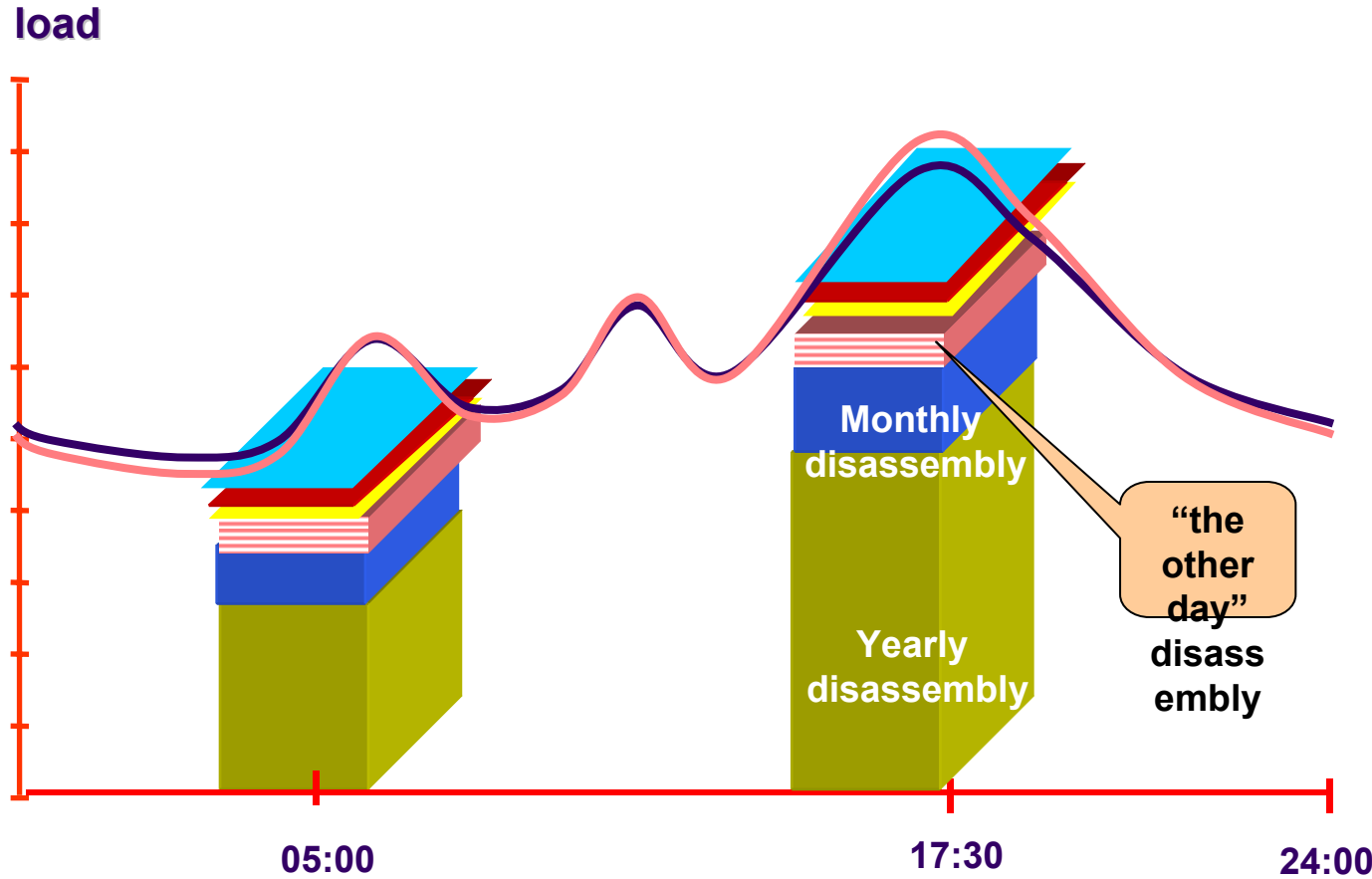
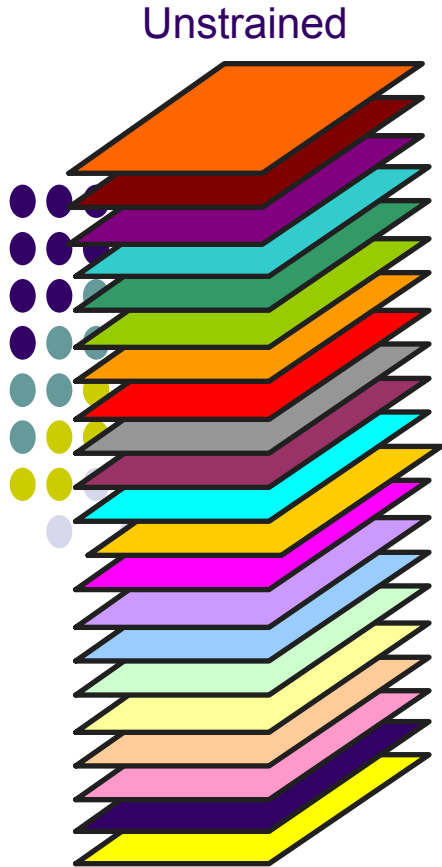


“The other day” Trading



Early Market Designs

Real Time Trading



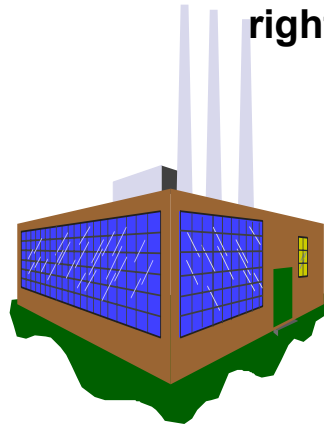
Generating Rights Trading



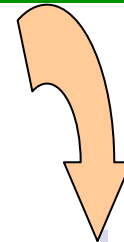
Can't fulfill the contract—specified electricity quota



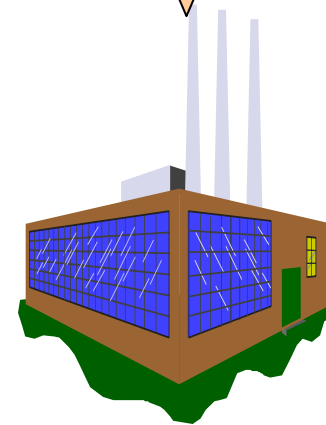
Sell generating rights



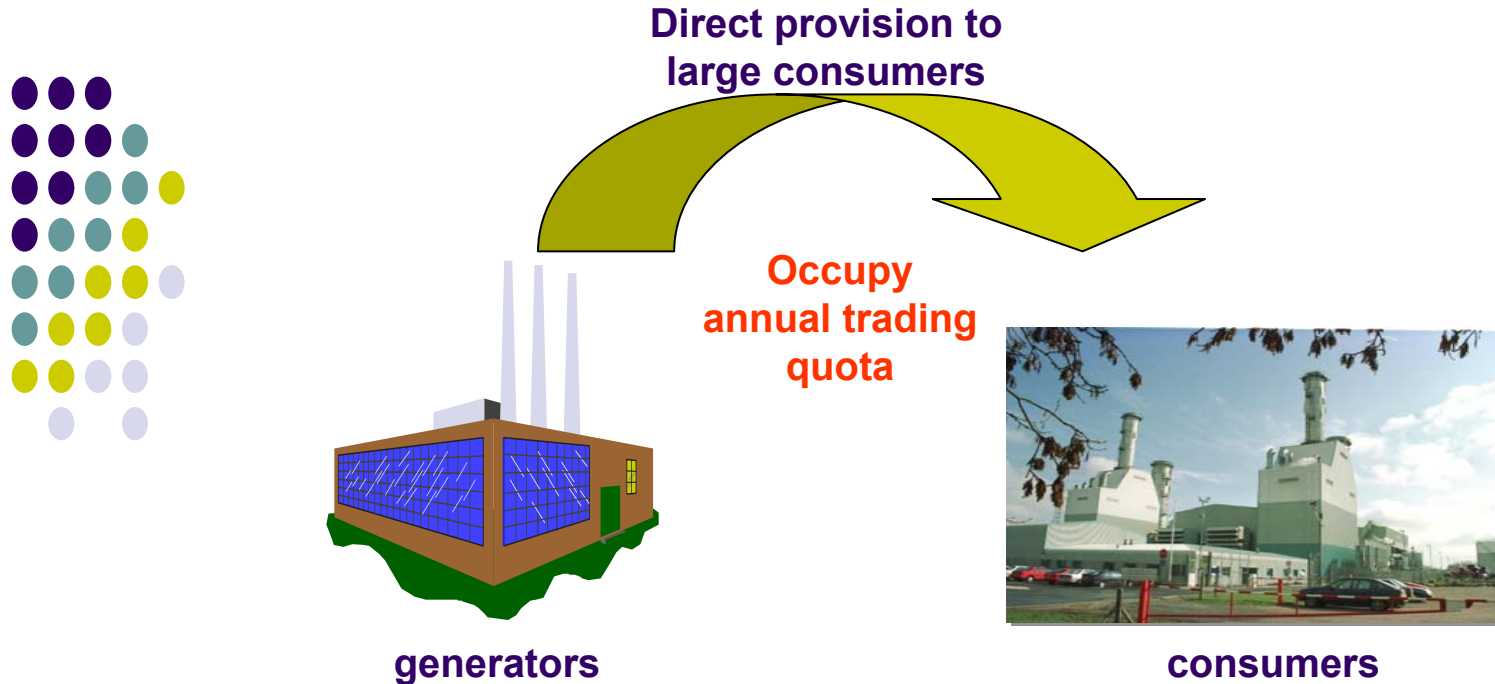
Make a match between sides



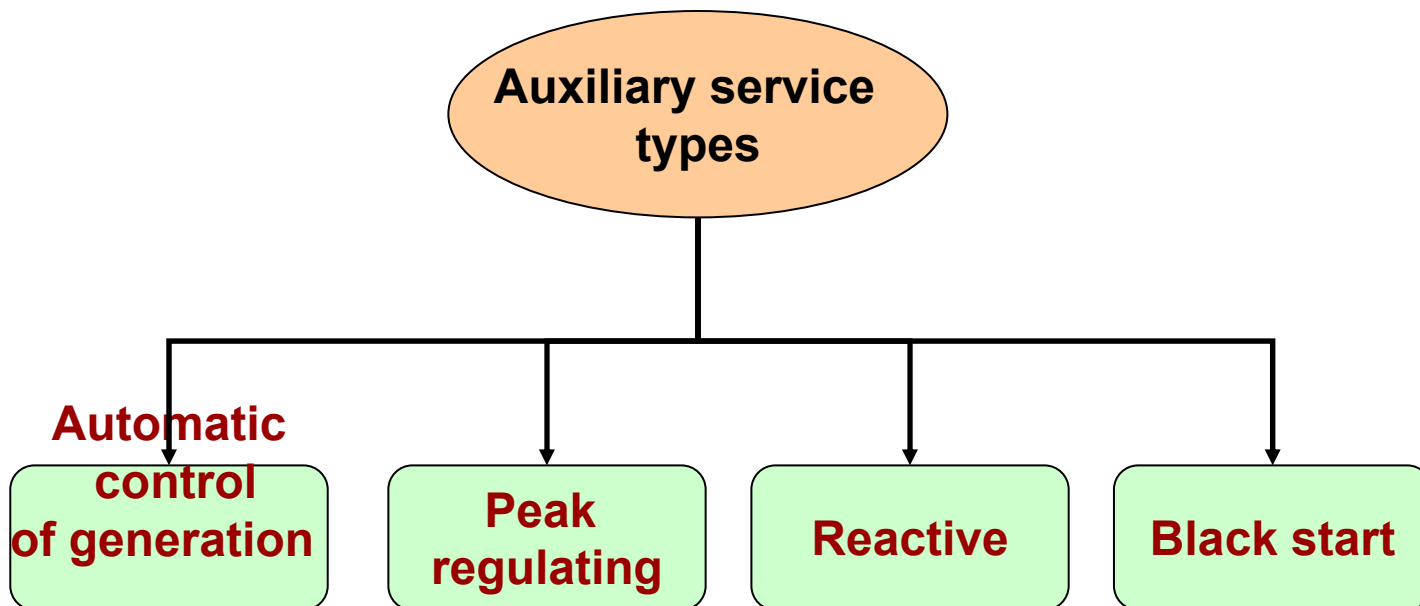
Buy generating rights



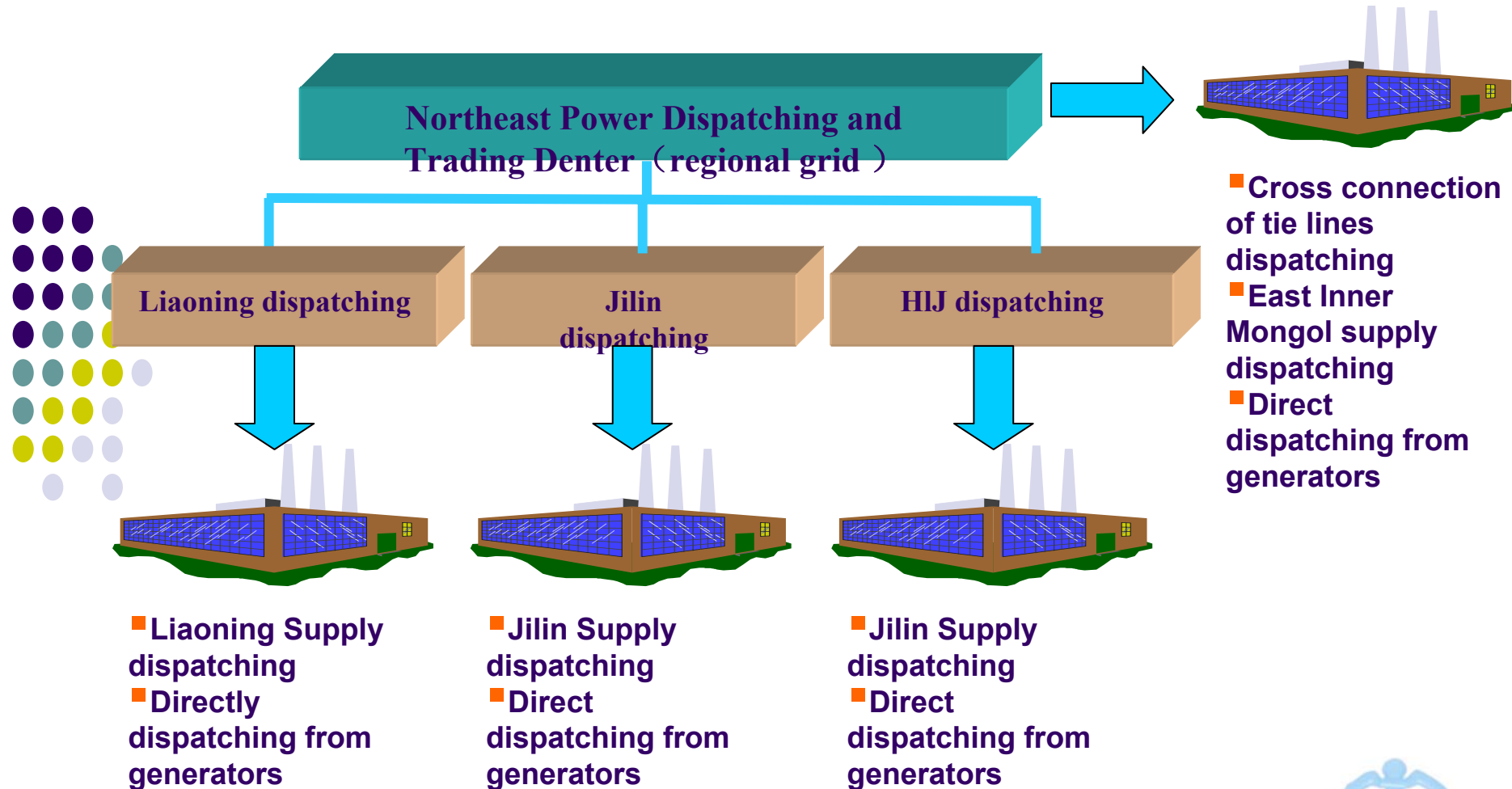
Bilateral Trading



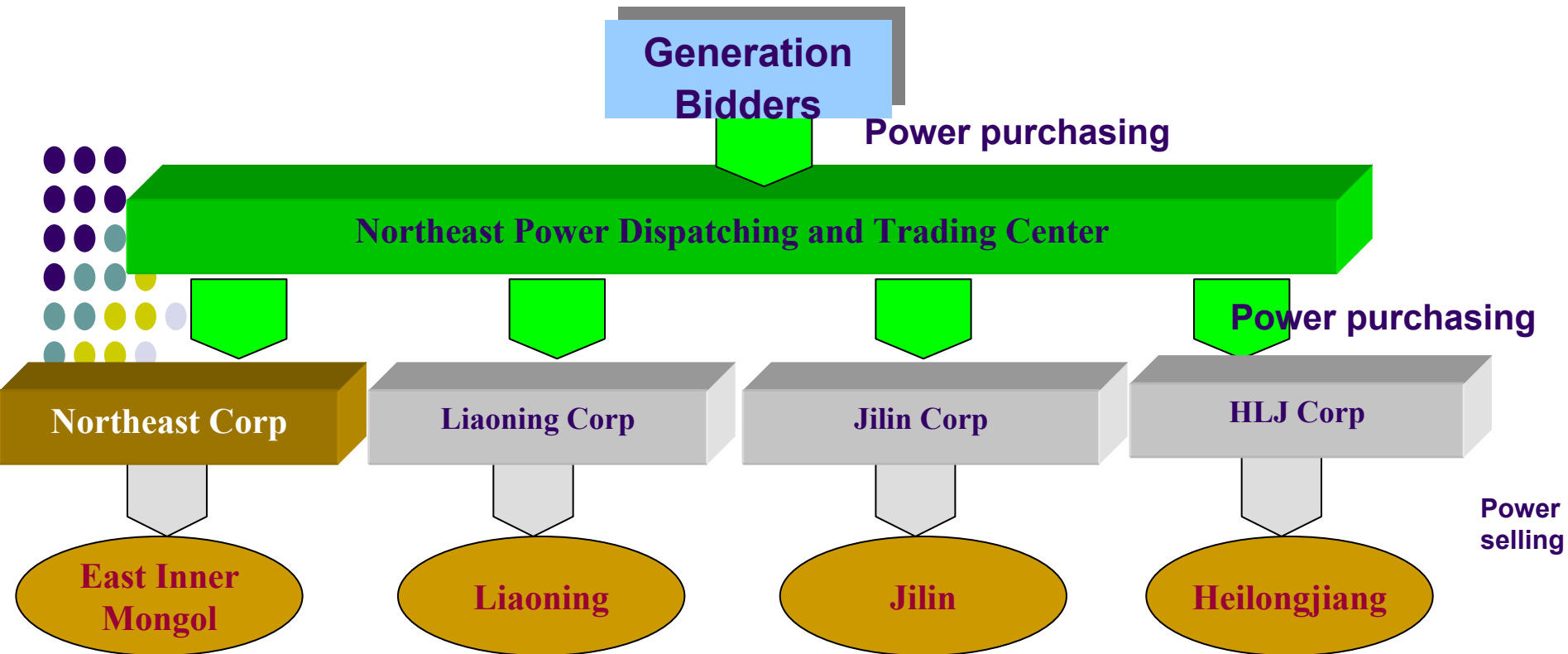
Auxiliary Services



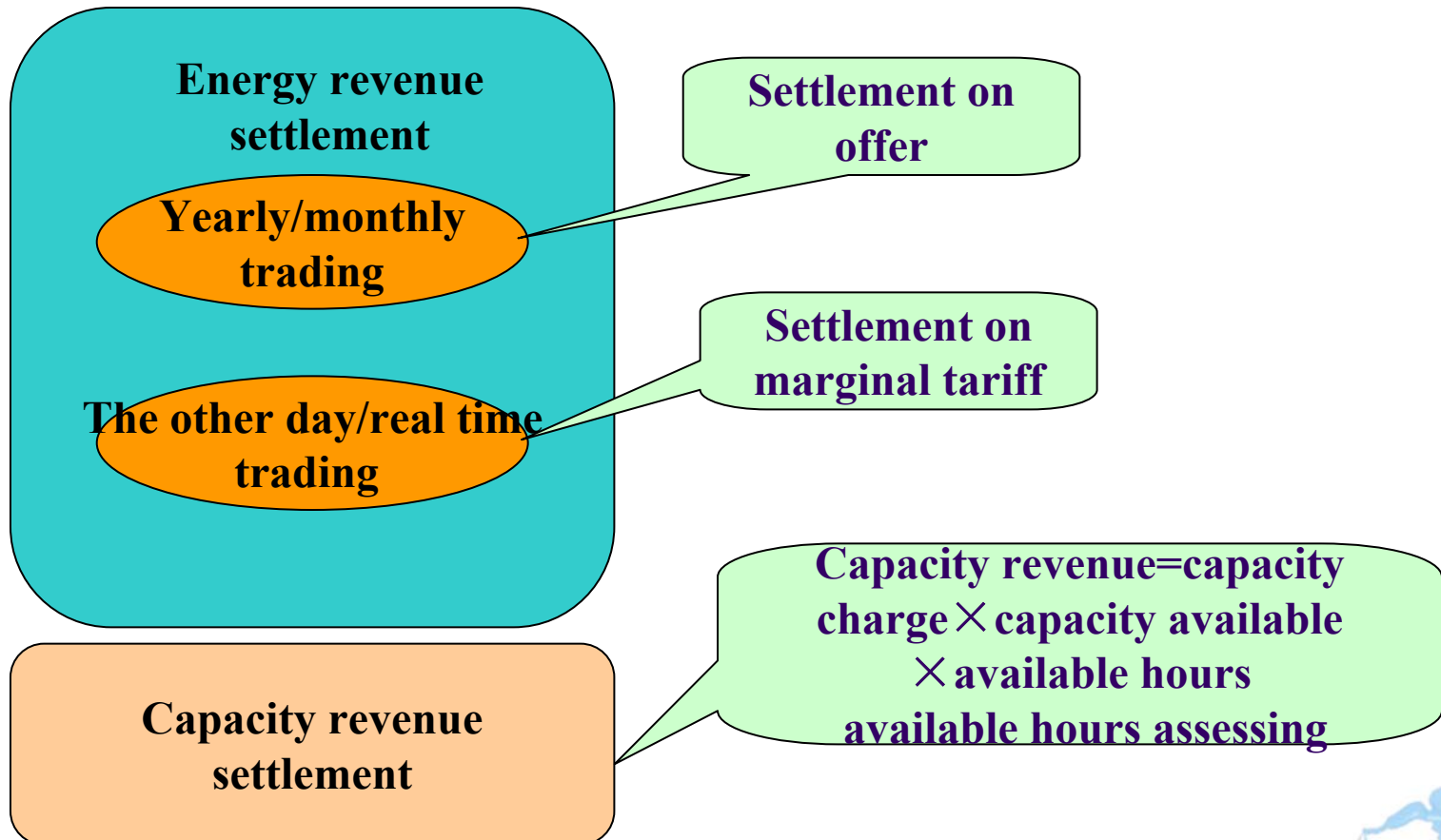
Dispatch Pattern



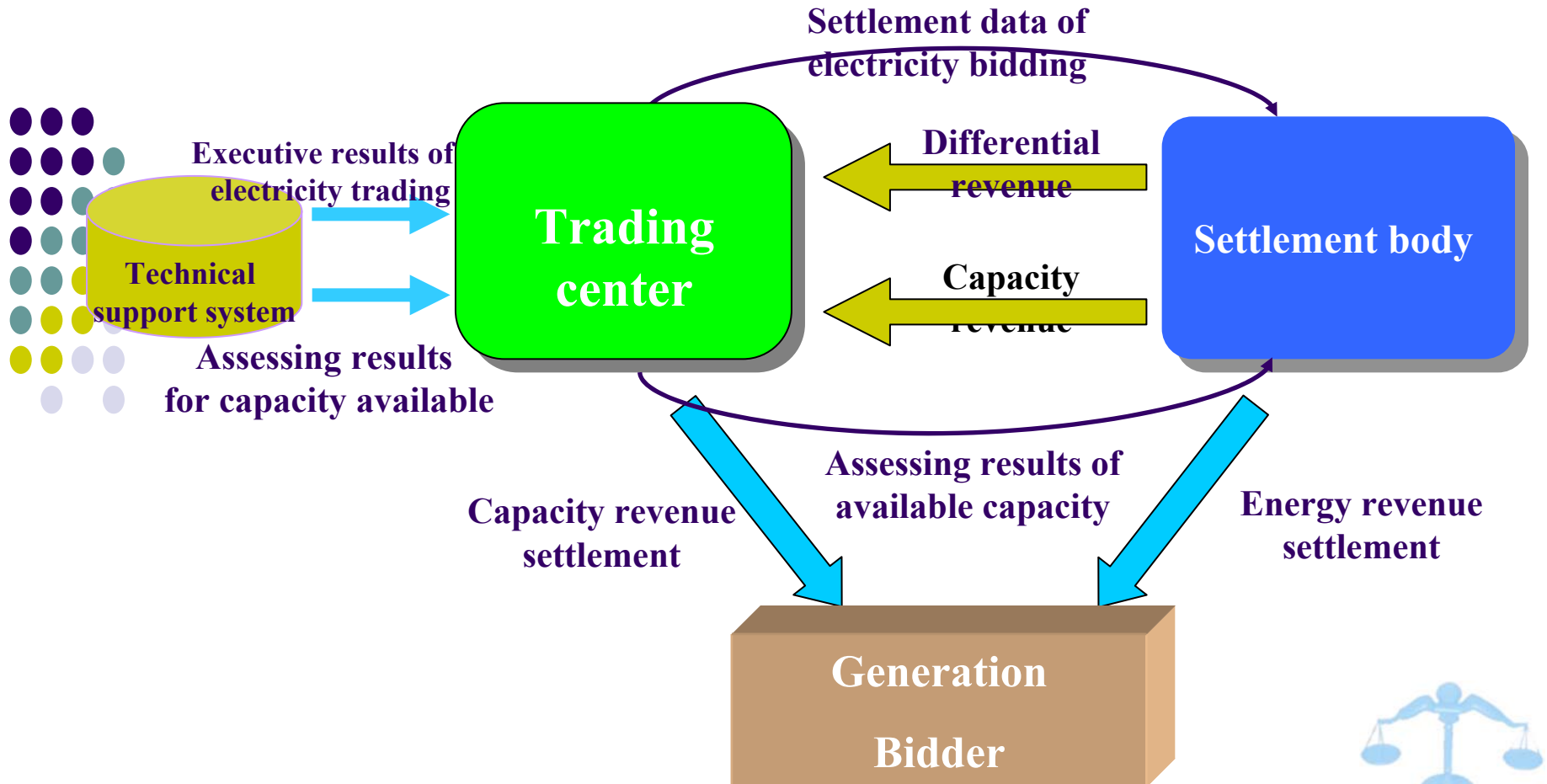
Power Purchasing Pattern



Settlement System



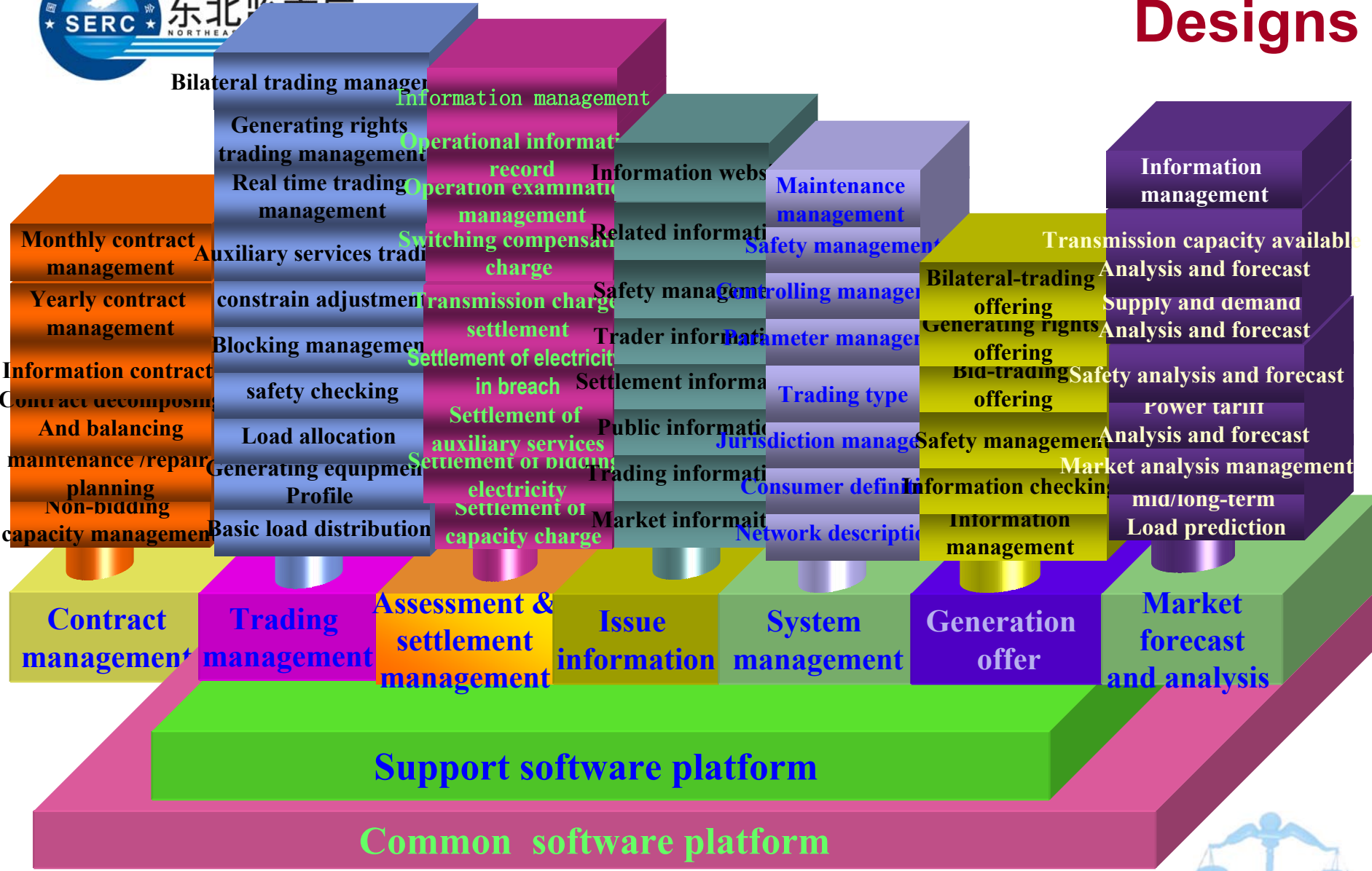
Settlement Procedures



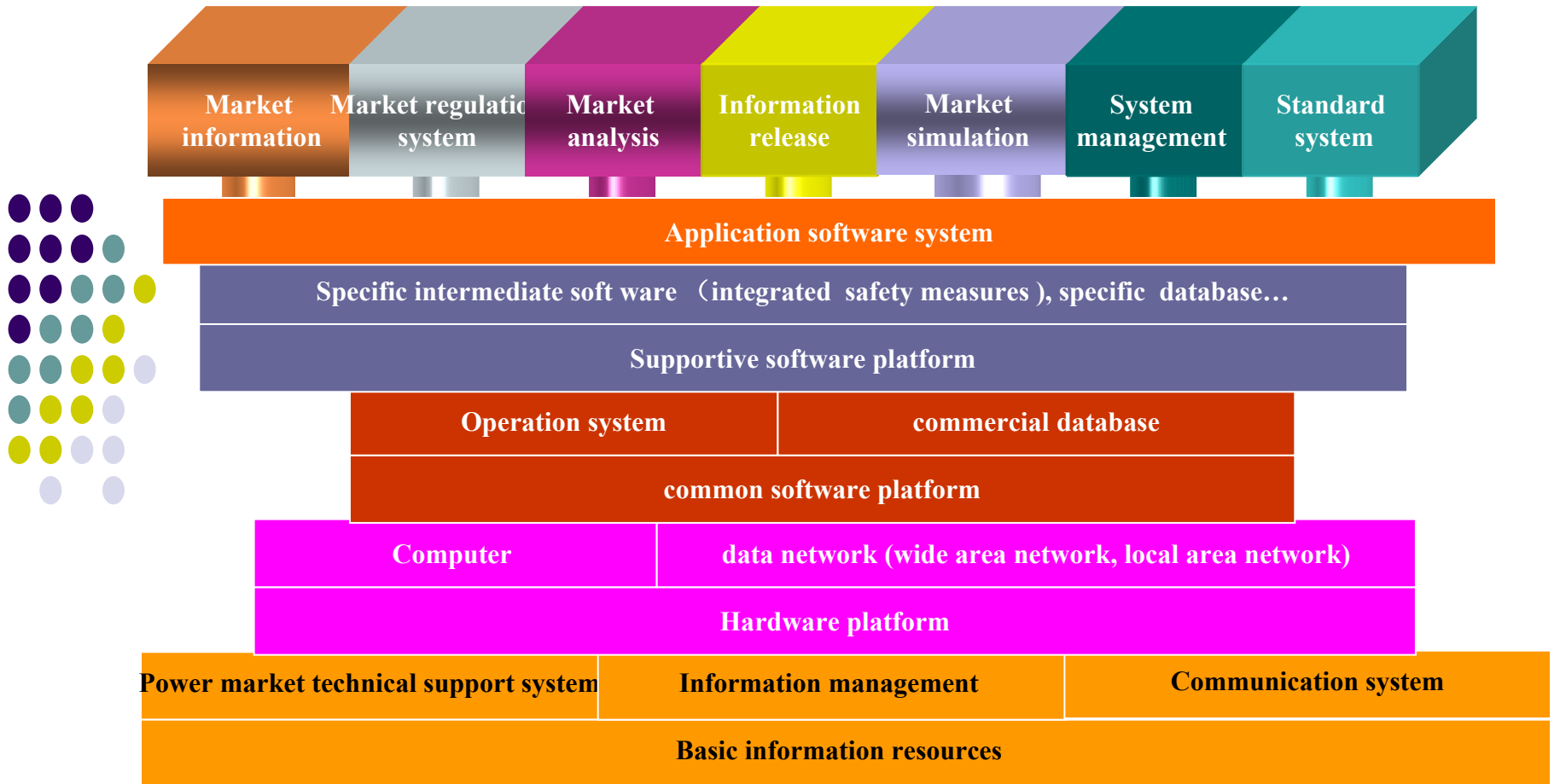


Technical Support System

Early Market Designs

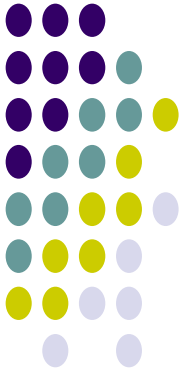


Regulation Information System

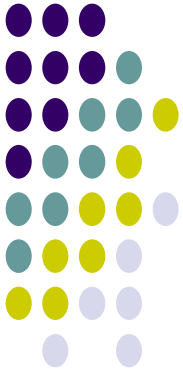


Market Features

- Regional platform, single buyer
- Two-part generation tariff
- Aggregate electricity competition
- Yearly trading in batches
- Phase approach: 5 phases per year and 3 per month
- Settlement on offer in long-term market, and on marginal power price in spot market



3. Trial Operation and the Development of the Northeast Regional Power Market



- Development of transient single-part tariff market
- Development of two-part electricity tariffs
- Trial operation



Market Development of Transient Single-Part Tariff

- In February 2003, the State Electricity Regulatory Commission (SERC) decided to experiment with electricity market in the North East Company
- On 6 June 2003, SERC issued the “Instruction on Establishing Northeast China Regional Power Market”(No. 2003 15)
- The North East Power Grid Company Ltd. was officially established on 25 September, and the Northeast Power Dispatching and Trading Center was set up under it.
- On 31 December 2003, a series of publications and regulations on this subject were issued , including the Single-Part Transient Tariff Executive Program
- On 15 January 2004, the single tariff simulation operation was started, and 5 monthly simulation sanctions were concluded



Market Development of Two-part Tariff

- On February 2004, the Northeast Electricity Regulatory Bureau preparatory group was found.
- On April 27th 2004, the NDRC issued the Notice of Generation Tariff Reform Pilots in Northeast Regional Power Market(No 2004. 709).
From May 10th to 11th in 2005, a meeting was held in Dalian to seek comments from relevant parties on regulations and methods on the northeast regional power market
- From 17th to 18th in May 2004, the meeting to seek comments from grip companies and generation corporations was held in Beijing.
- On May 24th 2004, the executive plan and regulations on two-part tariff came out.




Market Development of Two-part Tariff—cont'd

- On 19 June 2004, the simulation operation on two-part generation tariff was started.
- From 13 to 22 December 2004, the annual contract bidding for 2005 was consummated.
- However, the monthly bidding from January to April 2005 was deferred because of the difficulties in coordinating generation companies after the yearly bidding.
- In April, the SERE and NDRC jointly issued the Notice of Starting Trial Operation on Monthly Bidding in the Northeast China Power Market (No. 6 , 2005).
- From April 22 to 25, the monthly contract trading for May was concluded.
- From May 22 to 25, the monthly contract trading for June was concluded




Yearly Trading

- 
- The annual trading quota was 86.278 bil kWh, with a quota of 43.139 bil kWh for each time. It concluded in 2 phases.
 - The weighted average tariff of the tender electricity of the two yearly sanctions was 191.029/kWh. Accordingly, 0.2 billion surplus of balance funds is expected.




Monthly Trading

- 
- The quota of bidding in May was RMB 1.884 billion and the average tender tariff was 270.092 yuan/1000 kwh. Therefore, the deficit of balance funds is expected to be 78.46 million.
 - The quota of bidding in June was 1.728 billion and the average tender tariff was 267.388 yuan/1000 kwh. A deficit of 47.62million is expected.



Features

- 
- Generation companies were serious, active, and rational for market offering
 - Reasonable tender results reflected market laws
 - The allocation of resources was optimized within the Northeast region
 - With accurate and serious safety check, the trading results were able to ensure the network to operate safely
 - Technical support system operated steadily and trading calculation went right
 - Rules are specific and clear, and show no apparent weakness

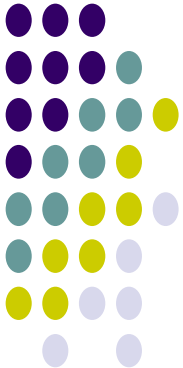


4. Lessons and Future Work

- Lessons
- Future Work



- Reaching a consensus and changing mindsets are necessary for the establishment of market
- Make a master plan and take all participants' interests into consideration
- It is necessary to have an overall design, implement it by phases, ensure safety, and implement plan steadily.
- Pay attention to risk prevention (risks on both safety and business)



- To evaluate the trial operation, establish and revise rules to make it perfect, then, turn to formal operation at appropriate time
- Further study “Next day” Trading and implement it at the right time
- Resolve the problem of North China electricity to have access to market
- Increase market players and extend the scale of large consumers for direct provision of electricity
- Study auxiliary service market and introduce it at the right time





Thank You!

