March on the sea with endless waves

——Strategic transition of CleanTech Co.

TEAM:Floraison ——— **Number: HB20221966**

1 Case Overview

- External Analysis-PEST
- Sensitivity Analysis-Purchase price
- Specific problems- Procurement disturbance

1.1 External Analysis-PEST >> Policy-oriented, rising DM, green awareness and technology iteration

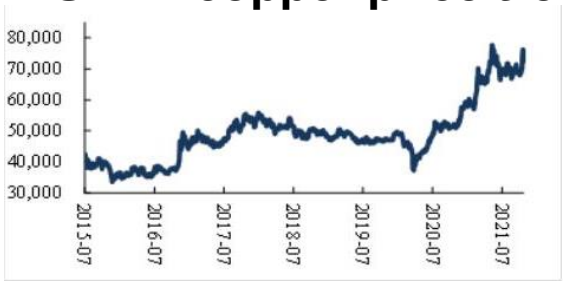
Politics: The era of PV parity is coming

- Carbon peak and carbon neutrality gained global attention
- Strong policy-oriented. e.g. 531 policy in 2018 lead to PV parity

- Grasp **preferential policies**
- Cope with **cost pressure**

Economy: Rising price of raw materials

SHFE copper price trend



- Focus on **cost in procurement**

- Price of **raw materials** is increasing
- Rise in ocean freight and temporary employment

Society: Growing environmental awareness

- Sustainable development and dual-carbon goals
- Public awareness of environmental protection has been raised

- PV power conform with green development and holds **enormous promise**

Technology: Superior intelligent junction box

- **Intelligent junction box** has superior heat dissipation and system stability
- Ordinary modules will lose profitability

- Clarify the orientation of **R&D**

Sources: WWW.ASKCI.COM

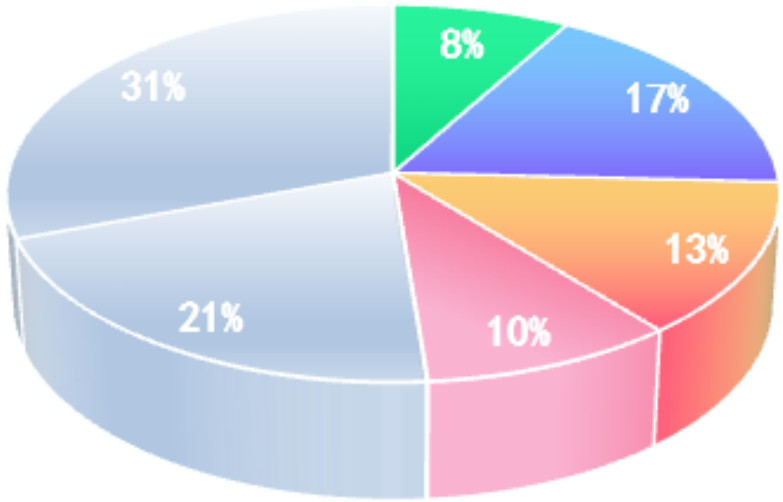
1.2 Sensitivity Analysis >> Fluctuation of purchase price can dominate net profit

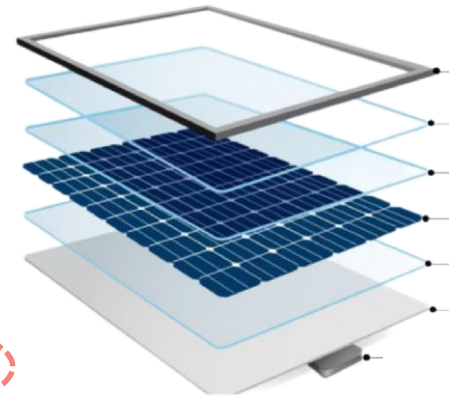
Primary direct materials

Cables | Diodes | Plastic Particles | Connectors | Tinned Strands

Price fluctuation of major raw materials	20.00%	10.00%	5.00%	-5.00%	-10.00%	-20.00%
Gross profit margin by simulation	14.68%	19.04%	21.22%	25.58%	27.76%	32.12%
Gross margin change	-8.72%	-4.36%	-2.18%	2.18%	4.36%	8.72%
The margin of change in gross profit	-37.25%	-18.63%	-9.31%	9.31%	18.63%	37.25%
Simulated net profit (0000's)	3,200.53	6,419.28	8,028.66	11,247.41	12,856.78	16,075.54
Change in net profit (0000's)	-6,437.50	-3,218.75	-1,609.38	1,609.38	3,218.75	6,437.50
Margin of change in net profit	**-66.79%**	**-33.40%**	**-16.70%**	**16.70%**	**33.40%**	**66.79%**

Proportion of different raw materials in total purchase

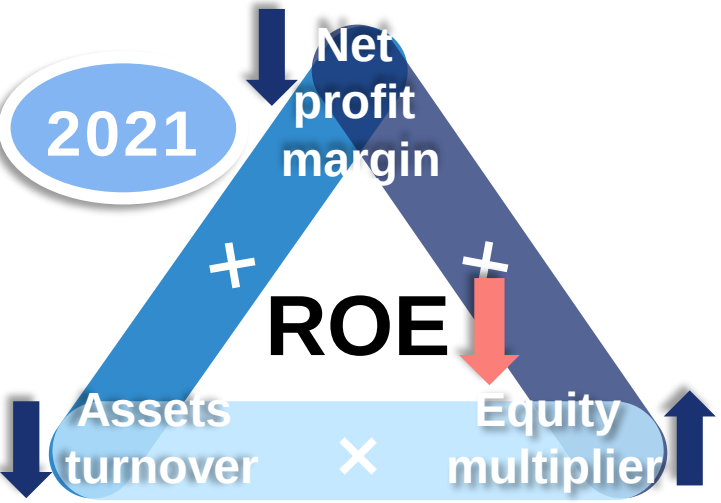




- Cables
- Diodes
- Plastic Particles
- Connectors
- Tinned Strands
- others

Source: 2021 Annual Report of Jiangsu Tongling Electric Appliance Co., LTD

1.3 Specific problems >> Falling into the trap of cost reduction, procurement problems are emerging



Sales Dept.

cheap packaging cartons lead to **external loss**

total procurement cost

Reduce cost & increase efficiency

2022

Procurement Dept.

Reactions

√ Adhere to current purchase price comparison system

√ Select new supplier with:
- 5% lower price
- 30 days' longer accounting period

Multiple suppliers

- Some parts are ordered by small batches with multiple suppliers.
- The purchase price varies according to the order quantity.

Higher quotation

- Sunny Manufacturing Company is in the forefront of outsourcing suppliers.
- The quotation is higher than other suppliers since automatic equipment update.

Lower weight

- The quotation of some competitors was 10% lower.
- The weight of a certain type of junction box of the company was 20% lower.

Stocking up

- The price of plastic particles has been rising.
- They planned to apply for a large amount of stock at one time

2 Strategy & Solution

- What is strategic procurement?
- Procurement total cost model
- Solve 4 problems with total cost model

2.1.1 Strategic & Operational procurement >> The carton case shows drawbacks of operational procuremen

Carton Case

Operational procurement

Analyzed with ***Balanced Score Card***

Learning and Growth

- Inappropriate employee motivation way

Cost reduction ⇄ Performance assessment

Internal Business Processes

- Low cost of procurement
- Carton hardness wasn't up to standard

Customer

Customer satisfaction ↓ Sales return ↑

Financial

- Rising trend of external failure cost
- Poor financial index

Summary of problems

Total cost

- ✓ Focus on a single procurement (low cost, payment terms)
- ✓ without comprehensive considerations of total cost

Supplier management

- ✓ Low cost is the main basis to choose suppliers
- ✓ Fail to build a long-term and stable strategic partnership with suppliers

Departmental cooperation

- ✓ Make procurement decisions based on one dept. interests
- ✓ Lack of cross-functional communication

2.1.2 Strategic procurement focuses on supplier partnerships and long-term development targets

Two types of procurement

Strategic Procurement

VS.

Operational Procurement

Purposes

- Lower total cost
- Competitive supply chain
- Achieve a single lowest purchase price

Features

- win-win cooperation with suppliers
- long-term development targets
- Keep a distance with each other — Low price and easy to buy

Comparison in timeline

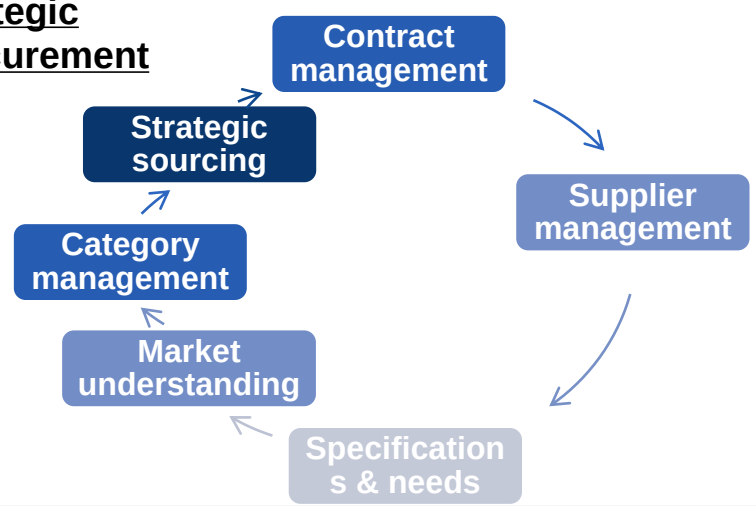
Relationship

- Upstream: Covers everything between sourcing and contract awarding
- Downstream: Everything that happens after the contract is awarded

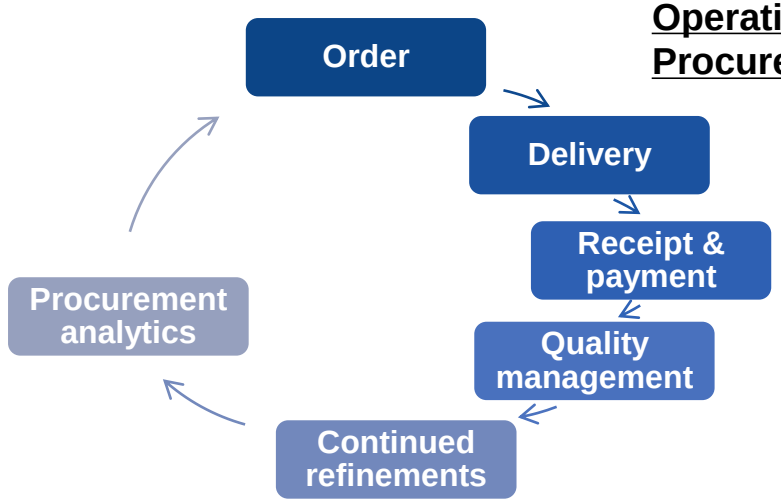
Every activity that occurs in the upstream processes tends to impact the downstream significantly

Upstream → Downstream

Strategic Procurement



Operational Procurement



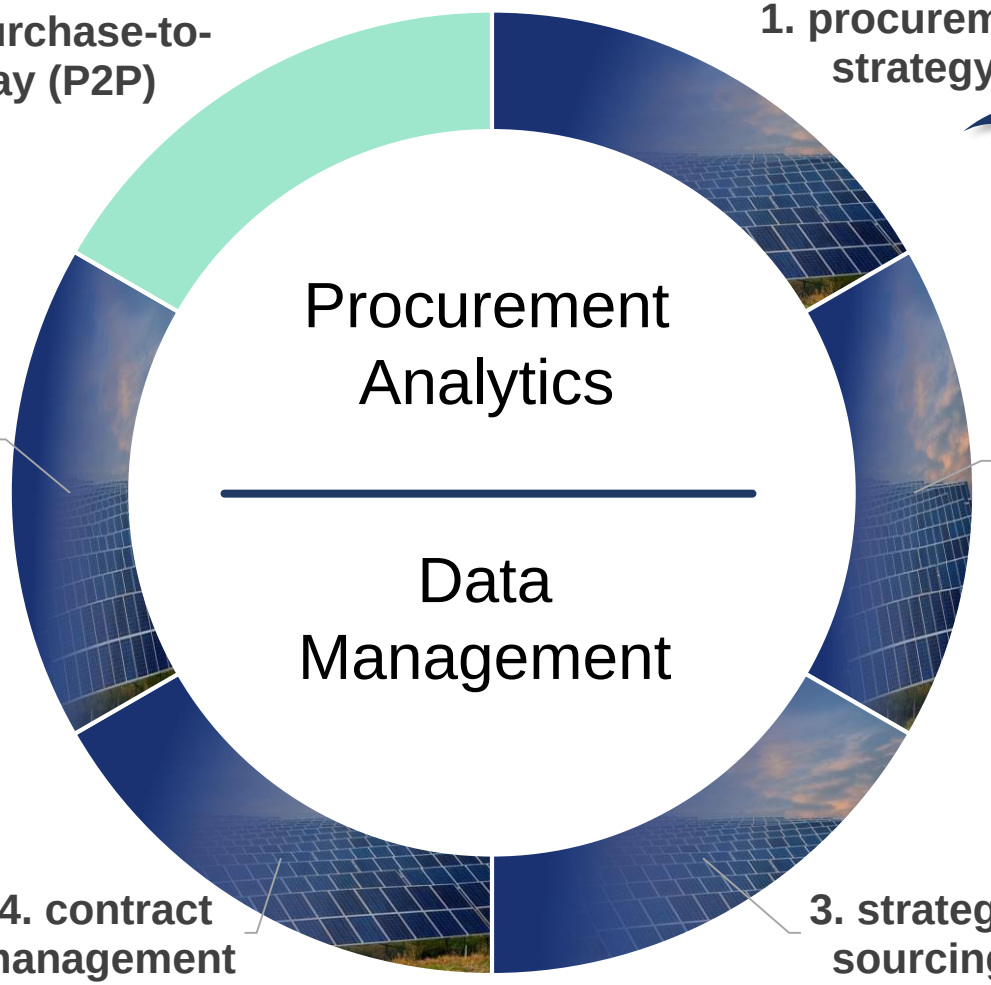
Sources: Kearney – Procurement: making digital transformation work for you

2.1.3 Strategic VS. Operational procurement >> Main activities and enablers

Main activities and work content

Sustaining value
Operational procurement (6)

- Evaluate & select suppliers
- Foster a deeper collaboration



Identifying and creating value
Strategic procurement (1-5)

Data and Analytics Form the Core of Strategic Procurement

Strategic Procurement Enablers

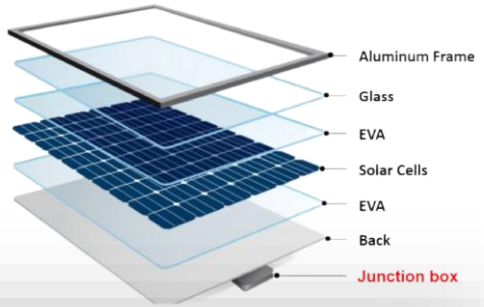
- Digital Solutions and Tools
- Organizational Capabilities & Culture
- Process, Governance, and Initiatives Management

Sources: www.igniteprocurement.com

2.2.1 Procurement total cost model >> Explicit cost includes material cost, supply chain cost and rebate

Procurement total cost model

Total cost = Explicit cost + Implicit cost



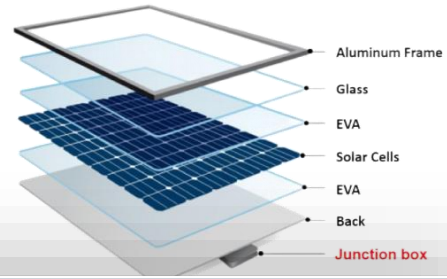
Cost Nature	Cost Category	Cost Item	Cost Item Description
Explicit	Material cost	Material cost (a)	Unit price x quantity + tariff (include in import material)
	Supply chain cost	Transportation expense (b)	Transport unit price x quantity (choose the appropriate mode transportation mode)
		Packing expense (c)	Select suitable packing materials
		Incidental expense (d)	Handling charge + sorting charge+.....
		Premium (e)	Premium on orders
		storage expense (f)	Stores keeping expense
		Subtotal (g)	g=b+c+d+e+f
	Rebate	Rebate (h)	Measured by Rebate policy

Sources: Gong Li, Huang Yiqin. Enterprise management analysis[M]. Beijing: ptpress, 2022.

2.2.2 Procurement total cost model >> Implicit cost includes cost of capital and quality cost

Procurement total cost model

Total cost = Explicit cost + Implicit cost

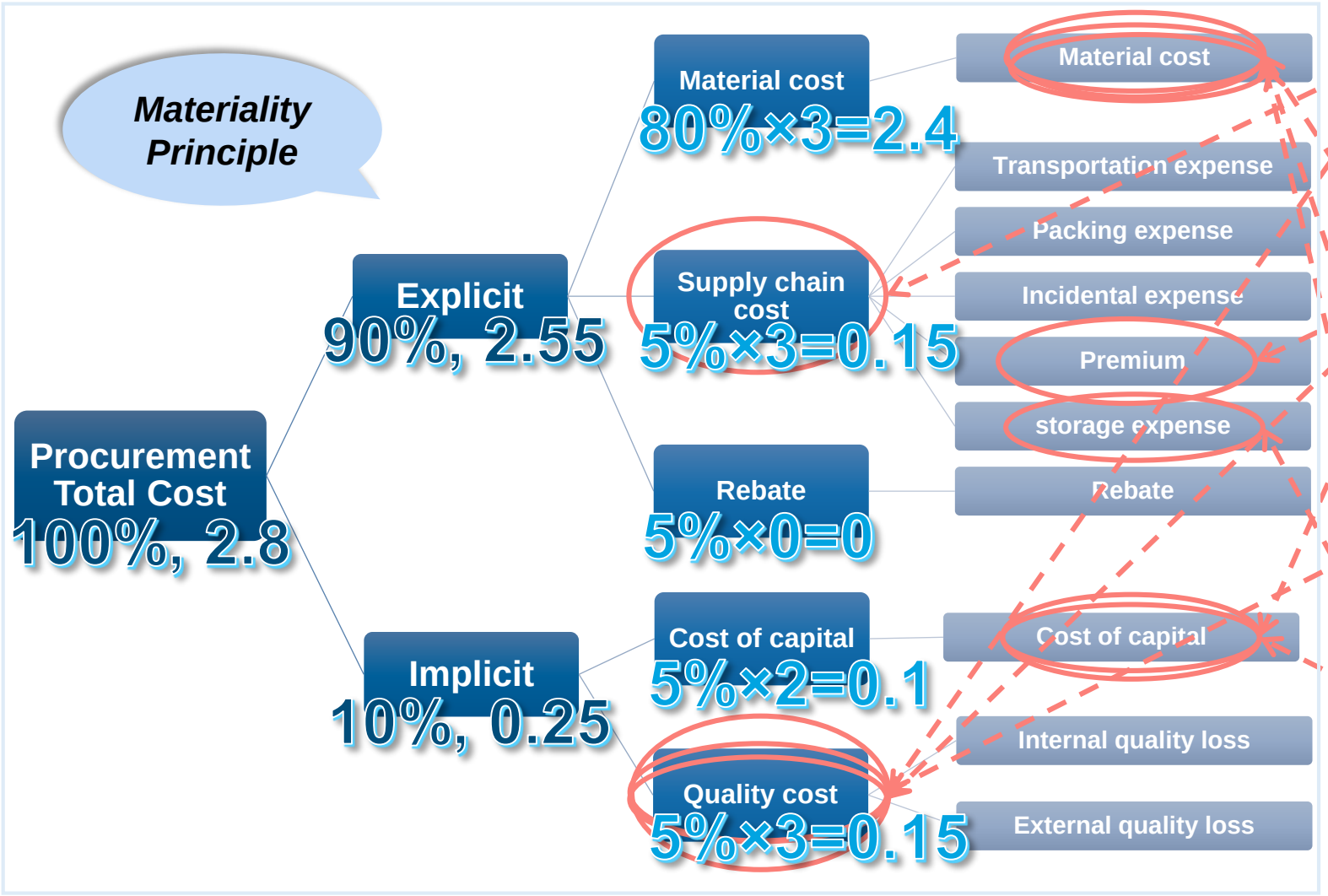


Cost Nature	Cost Category	Cost Item	Cost Item Description
Implicit	Cost of capital	Cost of capital (i)	Cost of occupied capital = occupied capital x cost rate of capital Capital occupied = material cost x SD of account period days SD of days due = standard days due - actual days due (The cost of capital rate is calculated according to the loan rate of the bank for the same period)
	Quality cost	Internal quality loss (j)	Return cost of unqualified inspection+ rework cost+ shutdown cost+ cost caused by replacement and maintenance
		External quality loss (k)	Customer's claim loss+brand reputation loss+.....
		Quality cost subtotal (l)	l=j+k (obtained from the enterprise quality system)
		Total purchase cost (x)	x=a+g+h+i+l
		Total purchase quantity (m)	m
		Total purchase price (p)	p=x/m

Sources: Gong Li, Huang Yiqin. Enterprise management analysis[M]. Beijing: ptpress, 2022.

2.2.3 Cost reduction measures generate amplification effect through total cost model

Procurement Total Cost Model



Research Problems

1 Multiple suppliers

- Supplier group integration
- Development partnership
- Real-time updated parallel procurement network
- Digital supplier evaluation system

2 Higher quotation

- Shorten payback period
- Negotiation skills—Discount
- Simplify the procurement process
- Corporate and mutual help with suppliers

4 Lower weight

- Save materials
- Low reject rate
- not easy to damage

5 Stocking up

- Procurement negotiation with suppliers
- Regular check for material inventory
- Interest on notes payable

Sources: Prospectus of QC Solar (Suzhou) Co., Ltd.

2.3.1 Business means: Supplier group integration >> Reduce suppliers to obtain economies of scale

Operational Procurement → **Strategic Procurement**

Operational Procurement	Strategic Procurement
Too many suppliers	Reduce the number of suppliers
Small purchase scale and trivial orders	Centralized procurement
Minimum purchase price	Decrease total cost of ownership

Supplier group integration —— Reduce the number of suppliers

Reduce the number of suppliers

Identify suitable suppliers

Quality
- Stable and effective quality assurance system;
- Equipment and process capability
- Product design
- Technology ...

Cost
- Material cost
- Packing expense
- Incidental expense
- Transportation expense
- Storage expense ...

Delivery
- Time control: Length of delivery time and whether delivery is on time ...

Serivces
- Pre-sale and after-sale service ability
- Response speed: response to prevention problems and interest in improvement work ...

Scope of application
- **Batch purchase of new products; • Strong product specificity;**
- **Complex products, which need more links;**
- **Products that can be replaced quickly**

Supplier selection principles

Matching
Supplier — **Same Size & Level** — Purchaser

Half proportion
Purchase Quantity ≤ **50%** Supplier's Capacity

✖ Full Supply Supplier

Quantity control of supply source
Core suppliers' number of Similar Materials → **2～3**

Expected effect

- Integrate demand to form scale effect
- Bargaining Power ↑
- Duplicate Procurement ↓
- Conflicts Between Departments ↓
- Uncertainty ↓
- Supply Chain Cost ↓
- Quality Cost ↓

2.3.1 Management means: Development partnership >> Establish long-term relationships

1 Perspective of Strategic Procurement

Develop a long-term cooperative, win-win trading relationship.

① The supplier is an extension of the buyer's enterprise

② The relationship with major suppliers must be lasting

③ Not only focus on the current transaction, but also attach importance to future cooperation.

2 Advantages of Developing Partnership

- Shorten supply cycle and improve flexibility in the supply chain
- Strengthen communication with suppliers, improve order processing process & accuracy of material requirements
- Reduce storage costs and accelerate capital turnover
- Share technology and innovation achievements, accelerate the speed of product development
- Improve the quality of raw materials and parts
- Increase mutual trust and achieve efficient cooperation and interest development

3. Implementation process

Reach Consensus ✖ strategic suppliers and large growth suppliers

- On overall objectives: procurement category objectives, periodic evaluation, information sharing and important initiatives, etc.

Conduct Joint Process Improvement Training Sessions ✖ relevant departments

- Identify potential areas for improvement

Clarify Position and Role

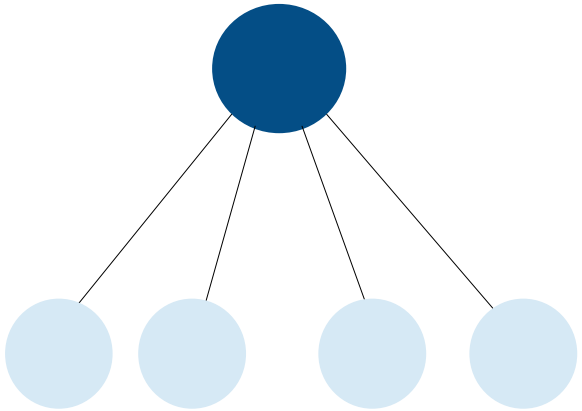
- The responsibility of each supplier is positioned to clarify its position and role

Reach Framework Agreement

- Establish a supplier relationship, which defined the relationship objectives

2.3.1 Technical means: Supplier network >> Build real-time updated parallel procurement network

Multiple Procurement ✖



Definition

• Obtaining a product or service component from more than one supplier

V

Advantages

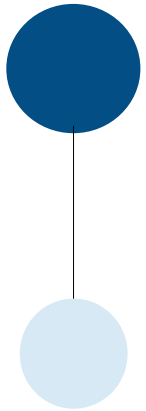
• Maintain competition
• Reduce supply risk
• Increase flexibility
• Prevent supplier dependence

S

Disadvantages

• Hard to encourage supplier commitment and limit opportunity to develop a partnership approach to supply management

Single Procurement ✖



Definition

• Buying all of one product or service component from a single supplier

V

Advantages

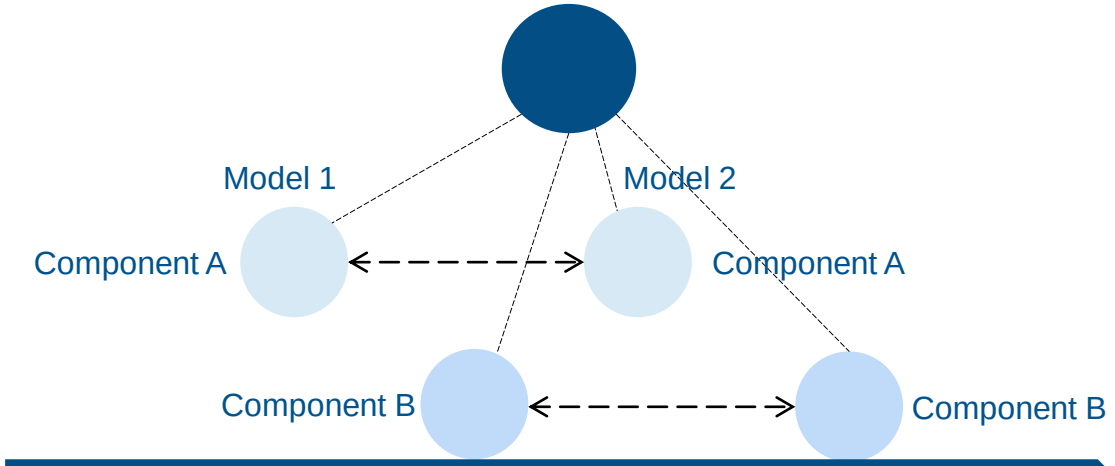
• Low transaction costs
• A longer-term focus
• Focusing on a wider range of performance objectives

S

Disadvantages

• Hard to encourage supplier commitment and limit opportunity to develop a partnership approach to supply management

Parallel Procurement ✔



Definition

• Having single-source relationships for components or services for different product models or service packages
• If a supplier is deemed unsatisfactory, it is possible to switch to the alternative supplier who currently provides the same component but for a different model.

Advantages

Multiple Procurement ✚ Single Procurement

VS

Disadvantages

Complex Arrangements

Solution

Digital Supplier Evaluation System
• Real-time update
• Periodic maintenance

2.3.1 Technical means: Supplier network >> Build digital supplier evaluation system

Frequency(monthly/ quarterly/ annual)

Important Indicator

Object (core/ important/ all)

Improvement and Development Goals

Track Improvement and Development

Evaluation indicators and weights

Indicator	Score	Weigh
Quality	X_j	W_j
Cost	X_k	W_k
Delivery	X_l	W_l
Service	X_m	W_m
...	X_n	W_n

Adjustments

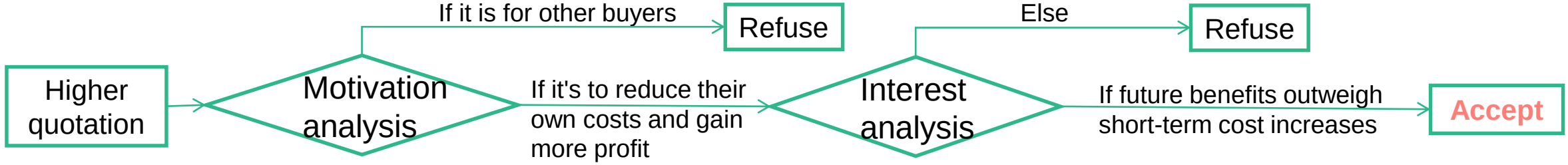
Result	Treatment method
Excellent	Remain unchanged
General	Normal improvement
Temporary Acceptable	Limited time to improve
Unqualified	Disqualification of supply

Data Acquisition and Conversion → Assessment Single Score → Summarize Scores

Grade	Summary Score	Result
A	>90	Excellent
B	70~89	General
C	60~69	Temporary Acceptable
D	<60	Unqualified

Sources: https://www.yuanian.com/gz/yngd/desc?yn_viewpoint_id=1680； http://www.glzzj.com/8437.html

2.3.2 Put yourself in other people's shoes and focus on relationship maintenance



Business Means:

Identify the supplier's pain points

From the perspective of cash flow pressure, in order to meet the demand for automatic renewal, suppliers need

- More money
- Shorter payback period

Shorten payback period instead of the price increase

Use negotiation skills—Discount

Quantity Discount	Payment Discount
Promotion Discount	No Returns Discount
Seasonality Discount	Distribution Discount

Technical Means:

Maintain cooperative relationship with suppliers

Purpose

- Simplify the procurement process
- Reduce the expense of manpower and material resources

Specific Method

a) Use EDI system to simplify the process of order sending and material confirmation
b) Realize resource information sharing of ERP system
c) Strengthen the supervision of the supply system and the management of IQC and IPQC

2.3.2 Put yourself in other people's shoes and focus on relationship maintenance

Management Means:

Sign strategic cooperation agreements

Requirements:

- The terms are detailed and clear.
- Establish legal constraints.

Purpose

- Propose preferential price based on supplier production in an annual or quarterly framework.
- Find benefits from other aspects.
  - Shorten shipment time
  - Improve the company's supply priority

Improve the supplier's attention

- ✓ Focus on maintaining the company's reputation
  - Guarantee the payment deadline
- ✓ Set aside reasonable profit margins for suppliers
- ✓ Centralized purchasing mode
  - Increase supply demand appropriately and strengthen contact with suppliers

Help the supplier

- ☐ In-depth understanding of suppliers, to provide targeted help for their weak parts
- ☐ Promote cooperation between R&D personnel of both sides
  - ☑ Selects cheap materials on the premise of ensuring performance
  - ☑ Choose standardized components and integrated design
  - ☑ Reduce unnecessary parts
  - ☑ Reduce material loss during component production
  - ☑ Consider the impact of component design on the efficiency of product assembly

Confirm that the supplier is of high quality

Reduce the company's procurement costs, including

- ¥ Check
- ¥ Tutoring
- ¥ Urge
- ¥ Promote R&D

2.3.3 The demand for reducing weight leads to intelligent junction box

Customer Portrait

Multi-function demand
- Current carrying
- **Heat dissipation**
- **System stability**

Market trend

Bargin demand

Basic demand
- Weather resistance
- Waterproof & dustproof
- UV resistance

Product characteristics

- Optimize power and control shutdown
- Reduce volume and save materials
- Multicore→ Single core
- Automate production
- Optimize process
- Save materials
- High safety
- Good sealing performance

JX

the demand for **reducing weight**

Competitors Strategy

Intelligent junction box
(has all merits above)

2.3.3 Technical means >> Technical & Product Center should exploit better functions

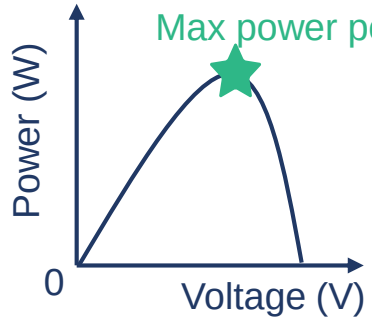
Superior functions

Advantages

Conclusion

To achieve strategic goals, we should increase R&D investment to develop intelligent junction box

1 MPPT

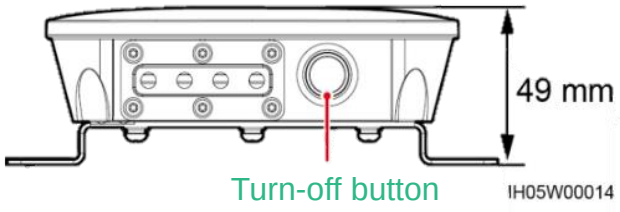


- Optimize automatically
- Track MPP in different conditions

Power generation efficiency may increase **47.5%** ↑

ROI ↑ | PP ↓

2 IntelliOff

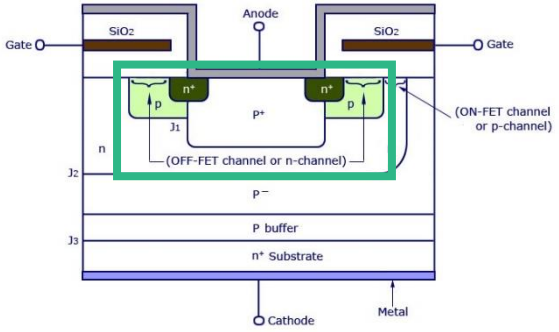


- Recognize abnormal situations (i.e. the fire)
- Cut connections among panels

Make judgements within **10ms**

Lowers the voltage from **1000V** to **40V** ↓

3 MOSFET



- Activate bypass current when shadowed
- Low VF feature

1/10 generated heat of normal junction box ↓

Extend the service life ↑

2.3.3 Management means >>Sequential two stages of R&D and overcome core technology firstly

If Develop Technology in Product Development

Result

- Uncertainty in Technical Development
- Progress cannot be guaranteed

R&D Investment Sequence

STAGE 1

Technical Development Stage
Choice of core technologies: important and urgent technologies

STAGE 2

Product Development Stage
Determine product positioning and further improve functionality

Marketing Mode

——R&D and Marketing Mutually Dependent

Core Technical Development Stage

- Choose independent R&D mode
- Working with downstream customers
- Cooperate with higher level institutions

Product Development Stage

- Meet customer needs.
- Guide customer requirements
- Tap potential users.

Selection and Allocation

——Choose Independent R&D Mode to Develop Core Technology

Technology	Investment
Intelligent turn-off technology	3,000,000
Maximum power point tracking(MPPT)	2,000,000

IMPORTANCE

- ✓ The security of junction boxes is extremely important

FEASIBILITY

- ✓ Less difficult
- ✓ Higher probability of success

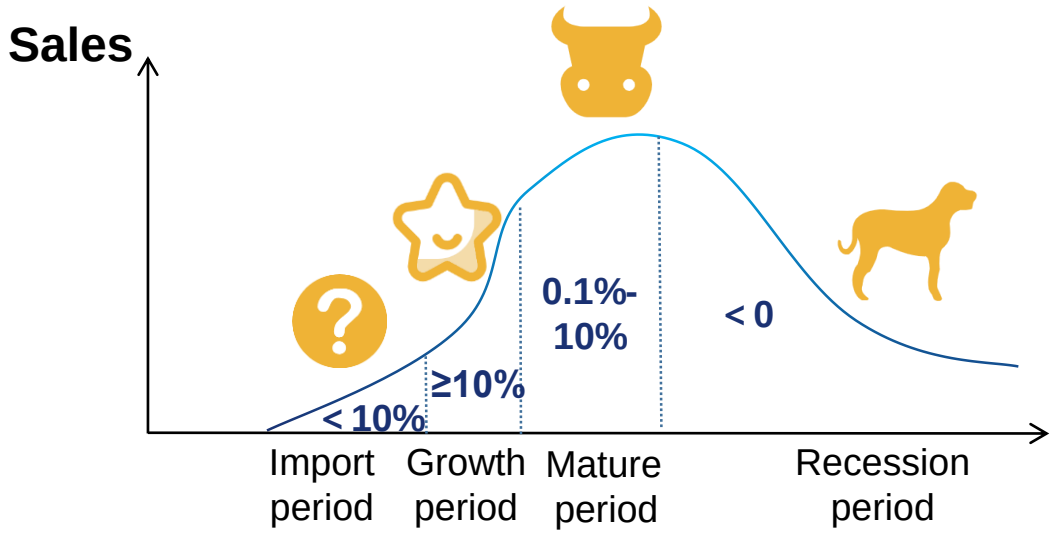
ACCOUNTING STANDARD

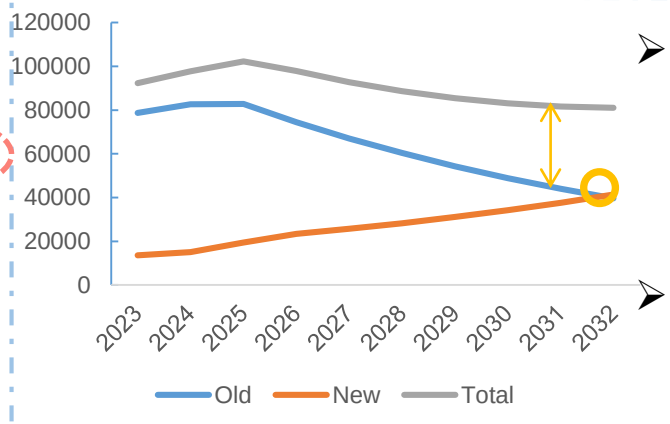
- ✓ Full expensing
- ✓ Meet the budget target

2.3.3 Product Life Cycle Theory suggests new product will bring stable revenue at high level

	2022E	2023E Old	2023E New
Operating Revenue (0000's)	71601.41	78761.55 +10%	13618.71
Unit Price	18.95	18.95	**17.05** -10%
Sales Volume (0000's)	3778.12	4156.28	798.75
Operating Cost (0000's)	58475.58	64339.21	9888.53
Unit Cost		15.48	**12.38** -20%
Gross Profit (0000's)		4422.34	3730.18
R&D Expense	3582.59		4082.59 +500
Operating Expense	1239.75		1599.53
EBIT	8303.48		12470.4

Variable cost ↓
Fixed cost ↑
DOL ↑





- Increasing income gap between **multiple products** and **single product**
- More **stable revenue** from multiple product costs

- After **10** years, the revenue of **intelligent junction boxes** exceeds that of ordinary junction boxes
- Be aware of increased operating leverage

2.3.4 Whether to apply for a large amount of stock at one time >> Probable cost it brings

	2020	2021
Assets turnover	1.23	1.11
Accounts receivable turnover	2.33	1.94
Accounts Payable Turnover	3.37	2.26
Inventory turnover	5.68	5.30

1.94 < 2.26

Assets turnover, accounts receivable turnover, Accounts Payable Turnover and inventory turnover of CleanTech Co.

Corporate cash is flowing out faster than it is flowing in
Poor ability to resist risks

Public offering

Strong demand for raw materials

Upstream suppliers are in a strong position

How to eliminate the negative impact of rising raw material cost?

Lower company's purchasing negotiating position

	2020	2021
Notes payable and accounts payable	12,281	×2 22,695
Inventory	7,539	10,028

Inventory, Notes payable and accounts payable of CleanTech Co.

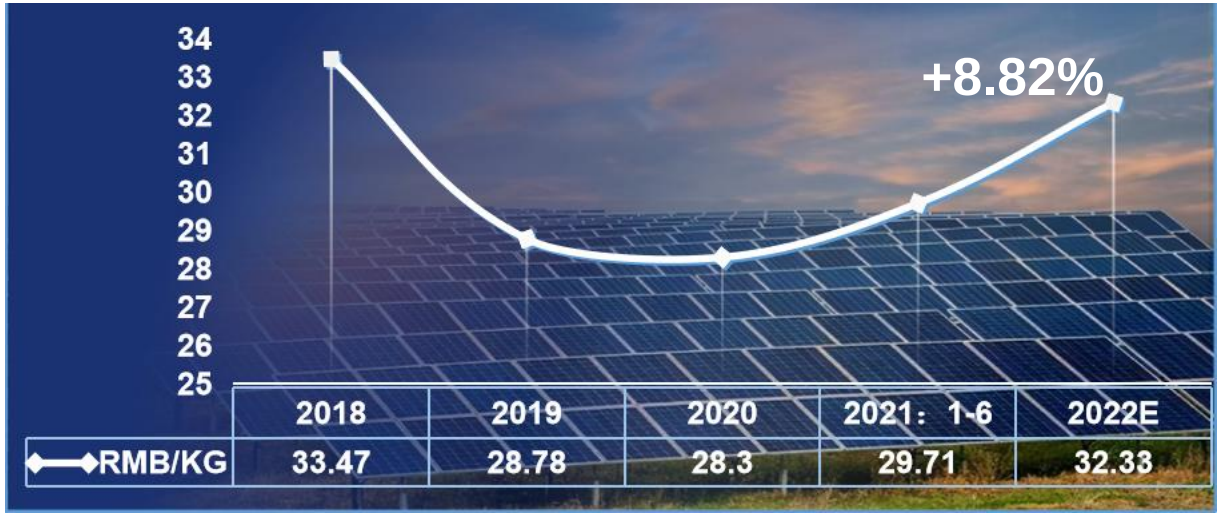
Notes payable multiply and incur large **Cost of capital**

Inventory rises → bring with it **Storage expense**

2.3.4 Management means: Apply for one-time bulk stock >> Focus on Business Analysis

Storage cost and Cost of capital — The main cost, not all — **Raw Material Cost**

Organize material stock counting regularly
Timely find and deal with some materials not suitable for current production conditions
Reasonable management expenses
Use ERP system for inventory management
Safe Stock (SS)
Sign notes payable management method
Buy portfolio , expand financing channels
Control enterprise interest expense
Choice of payment option



2018-2022 Unit price of Plastic Particles

Business Analysis Department

Select the **best employees** in each department

- **IT** Department
- **Finance** Department
- **Business** Department

Data connection + Form when needed

Actively negotiate with key customers according to material market situation + Deepen industrial chain cooperation + Technology innovation,Process improvement and Fine management

Keep track of raw material prices+Mutual benefit and win-win results
+Improve production efficiency and product quality

Sources: 2021 Annual Report of Jiangsu Tongling Electric Appliance Co., LTD

2.3.4 Technical means: Not apply for one-time bulk stock >> Long hedge for Plastic Futures

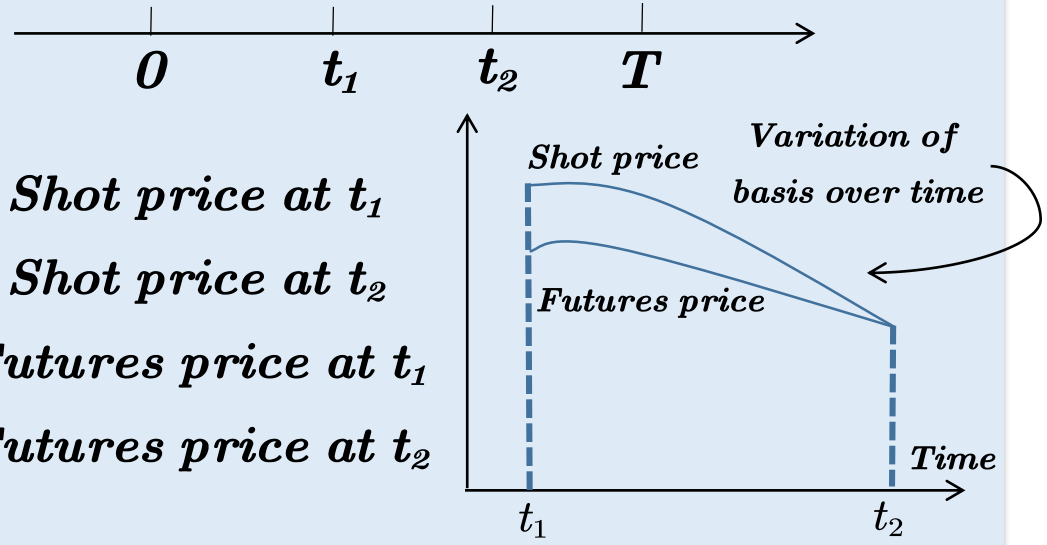
Hedging Strategies for Plastic Futures

!! Hedging strategies for Futures are designed to lock in prices rising trends rather than make money

Reduce the risk of future procurement cost increases

Plastic futures(L9888) 2021-2022 prices (Source:gushitong.baidu.com)

Long hedges can be used for CleanTech Co.



Advantages of futures markets

Reduce negotiating time

- Mark-to-market
- Strong Liquidity
- Low transaction cost
- Market-determined price

Basis Risk

The exact time of purchase cannot be determined

- Access the futures market at any time
- Open a position before the expiration of a futures contract

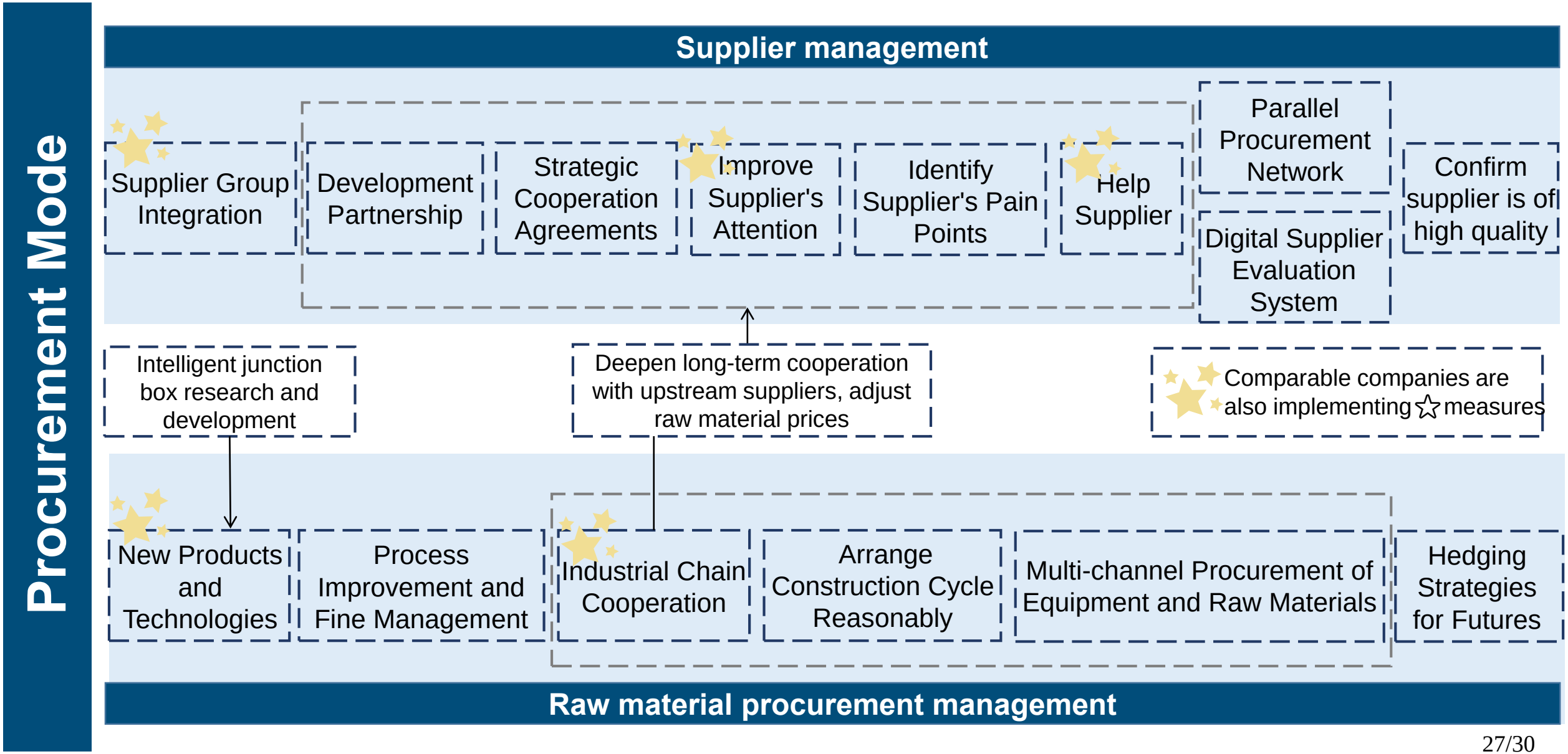
The underlying asset of the futures contract is not exactly the same as the plastic particle

Sources: gushitong.baidu.com

3 Implementation & Risks

- Summary of measures
- Implementation with five-year roadmap
- Risk warning with risk map

3.1 Summary of measures >> Procurement mode



3.2 Long-term strategic program execution plan >> Prediction with five-year roadmap

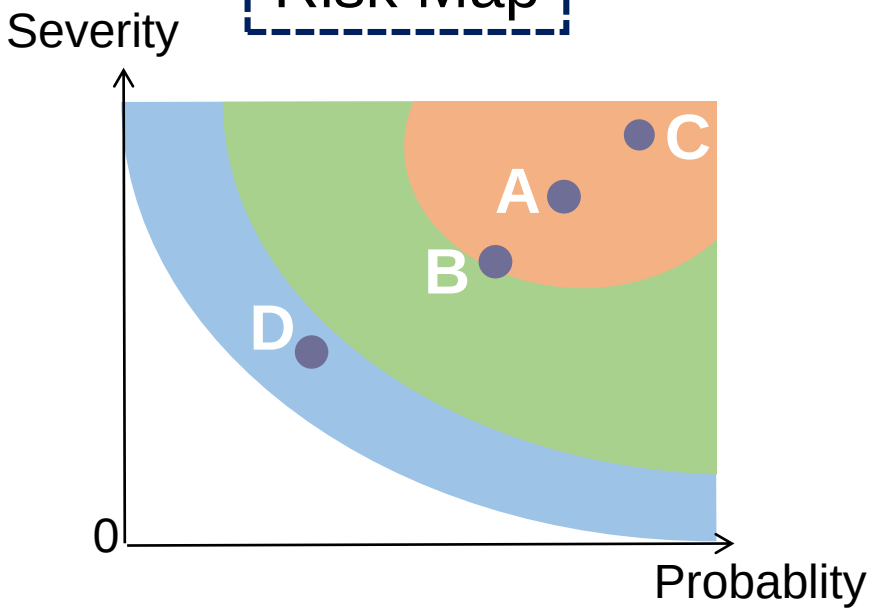
Target \ Time	Year 2022		Year 2023		Year 2024		Year 2025		Year 2026		Priority
	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	
Business Methods											
• Supplier group integration				■	■	■	■	■	■	■	★★★★★
Management Methods											
• Development partnership				■	■	■	■	■	■	■	★★★★★
• Sign strategic cooperation agreements				■	■		■		■		★★★★★
Technical Methods											
• Build real-time updated parallel procurement network		■	■			■	■	■	■		★★★★★
• Build digital supplier evaluation system		■	■			■	■	■	■		★★★★★
• Use ERP system		■	■	■	■	■	■				★★★★
• Develop intelligent junction box		■	■	■	■	■	■				★★★★

Given moretime

1. Analyze the performance of new business to decide the future develop plans.
2. Explore the deep demand of clients and enlarge the targeted customers to get more profit.

3.3 Risk identication >> The risks in the process of procurement

Risk Map



- A: Risk of procurement contract
- B: Operational Risks
- C: Planning risks
- D: Unexpected risks

Classfications

A. Risks of procurement contract

- The contract template begins with a large block of definitions of proper nouns
- A contract trap deliberately set by the supplier
- The daily management of internal contracts is chaotic

B. Operational risks

- Neglect to supervise the performance and acceptance process
- Deliberately lower acceptance standard because of collusion with supplier

C. Planning risks

- The unscientific procurement plan made so that the target have deviated greatly

D. Unexpected risks

- Unexpected risks caused by factors such as nature and economic policy

Solutions

- ✓ Purchasing managers need to know proper nouns
- ✓ The description of the contract object, price, method of payment and terms of letter of credit must be clear
- ✓ Strengthen the daily management of internal contracts
- ✓ Strengthen the full supervision of the whole process of material procurement
- ✓ Focus on the plan formulation, contract signing, quality acceptance and payment supervision
- ✓ Establish enterprise procurement risk management procedures
- ✓ Investigate whether predictions deviate from reality
- ✓ Take measures to deal with possible risks in advance
- ✓ Keep an eye on the market change

Sources: Cao Qin. Research on the practical application of enterprise procurement risk avoidance[j]. Chinese market,2022,(34):170-172.

TEAM: Floraison

Thank you!