

The Tripartite Seminar on Industrial VOCs Management Practice among China, Japan and Korea

The Activity of VOCs Reduction on Paints & Coating (Profit Creation by Voluntary Approach)

27 th.10.2015:Peking(北京)China(中国)

Coating Equipment Manufacturers Association(CEMA)

ri4ben3tu2zhuang1ji1xie4gong1ye4hui4

(日本涂装机械工业会)

ping2ye3ke4ji3

Katsumi Hirano(平野克己)

Subjects of Lecture

- Responsibility of VOCs Reduction
On Paints and Coating
ze2ren4zai4tu2liao4he2tu2zhuang1
(责任在涂料和 涂装)
- Concrete Action to Majority of Coating Enterprise
shi2ji4dehuo2dong4
(实际的活动)
- VOCs measure is Compatible with Profits
chuang4xin1li4yi4you2xue1jian3
(创新利益由VOCs削减)

CONTENTS(目次)

1. Summary of VOCs Reduction on Paints and Coating

gai4yao4

(概要 ; VOCs削減在涂料和涂装)

zhi4yuan4huo2dong4

2. Voluntary Approach(志愿活动) (Profit Creation by VOCs Reduction)

3. Result of an Activity

ruang3guan3

Case 1:Paint Hose(软管)

huan4se4shi2

Case 2:Color Change(换色时)

yuan2dandan1wei4

4. Cost Unit(原单位)

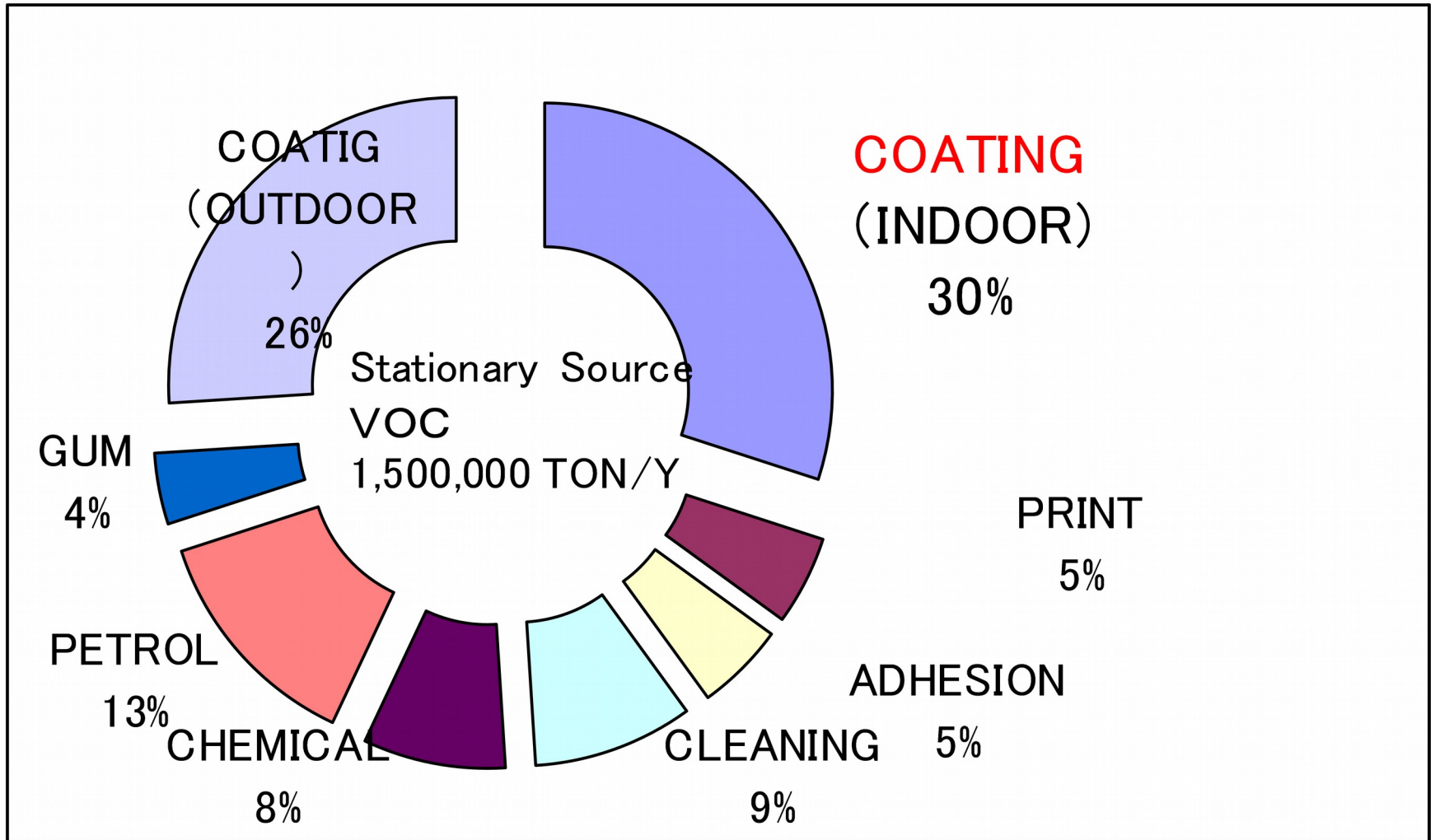
COATING(涂装)

Every Thing is consist of Industrial Coating(工业涂装)

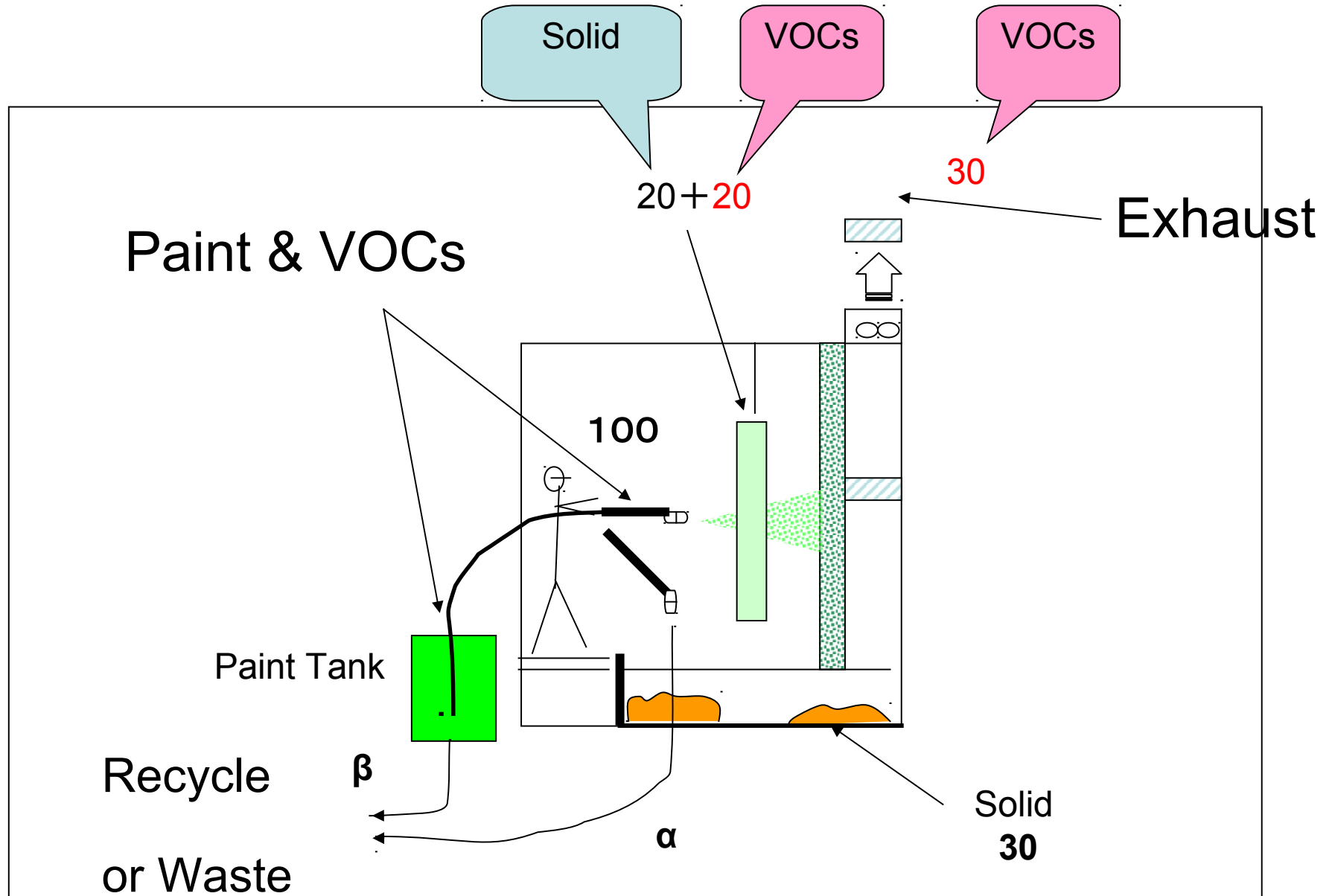


KUBOI COATING WORKS CO.,LTD.

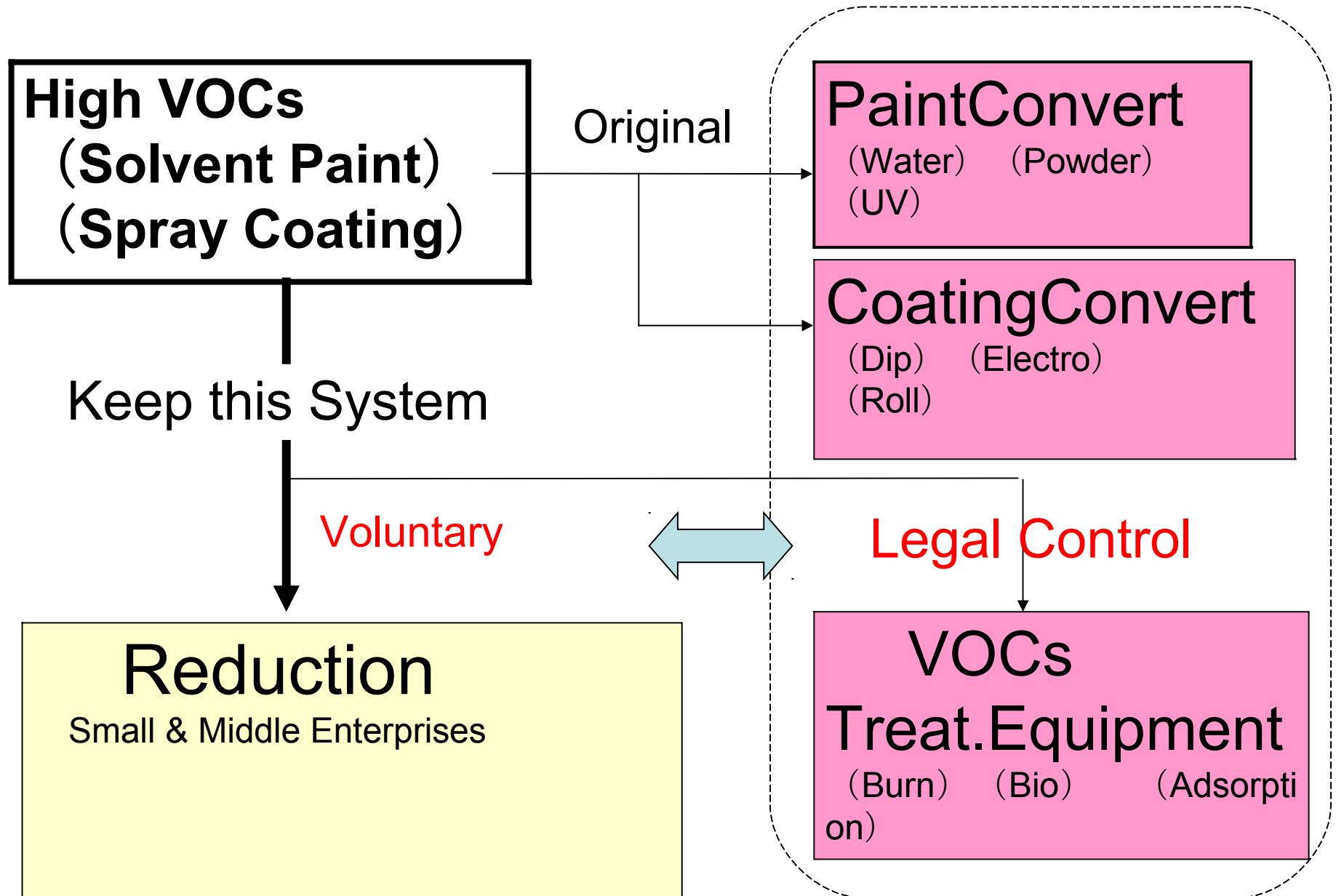
1. VOCs Emission at Stationary Source (2000th by Ministry of the Environment)



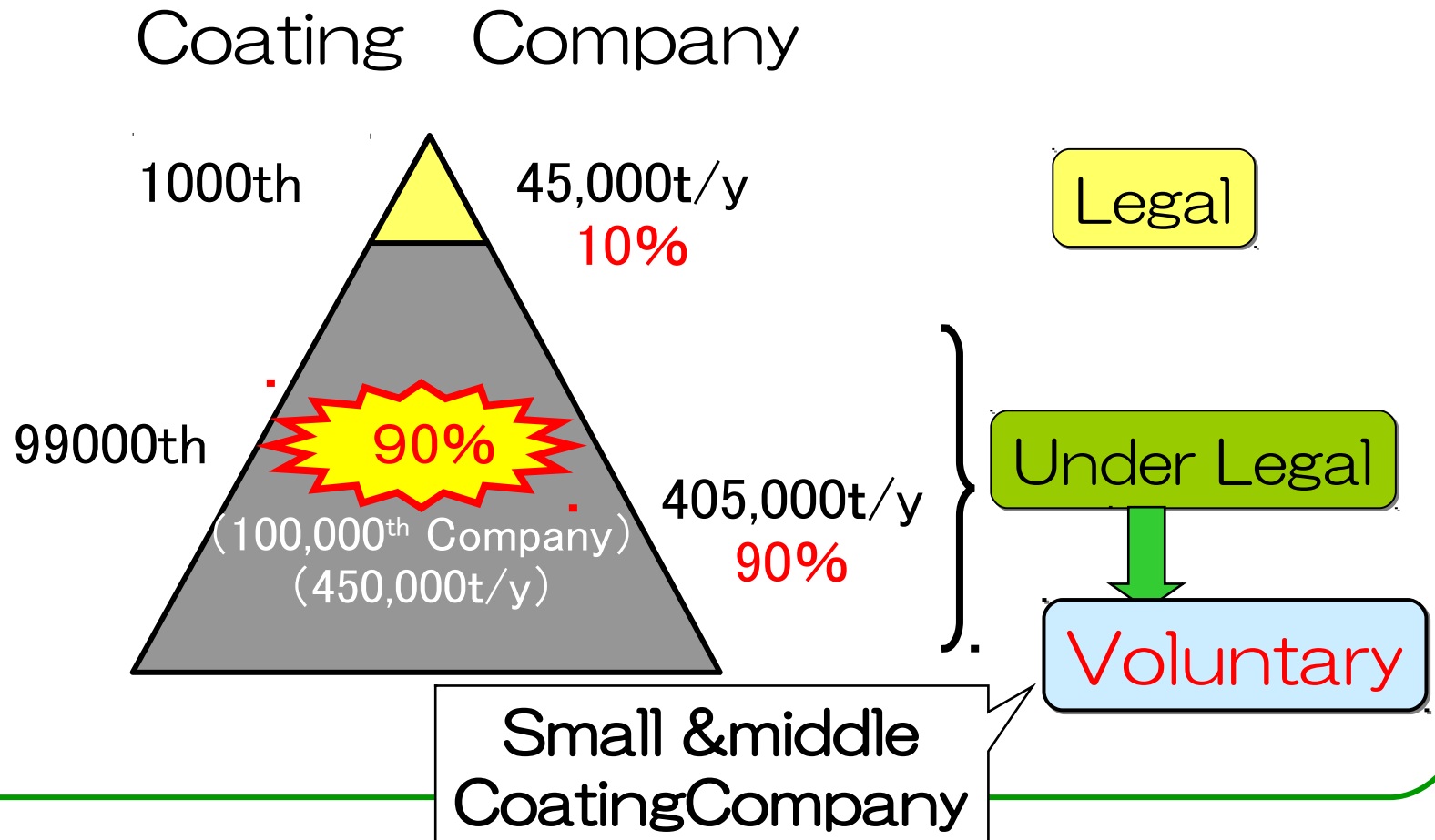
1.1 Spray Coating



1.2 General Measures On Paints and Coating



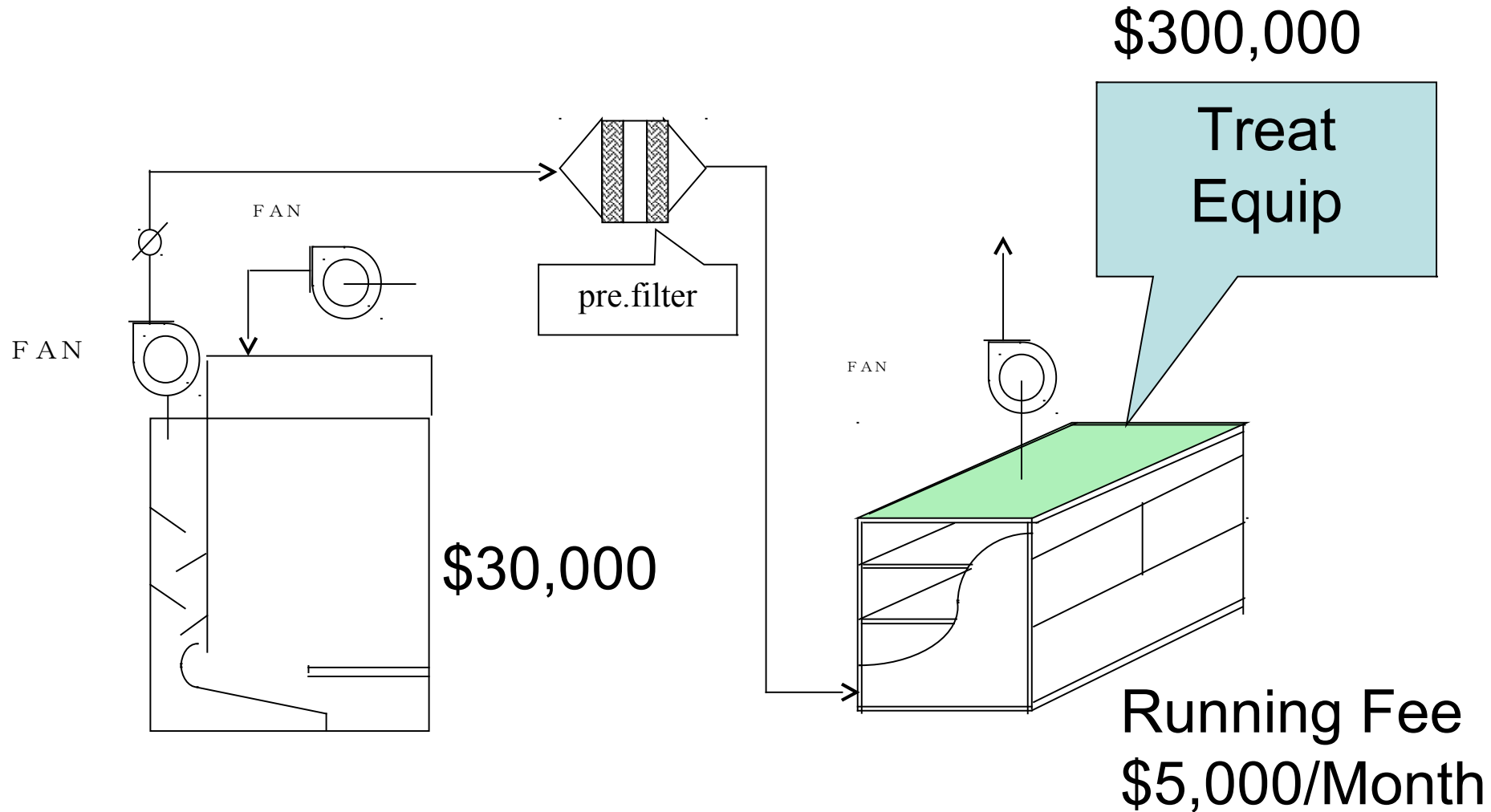
1.3 Coating Enterprises (Ratio of Size)



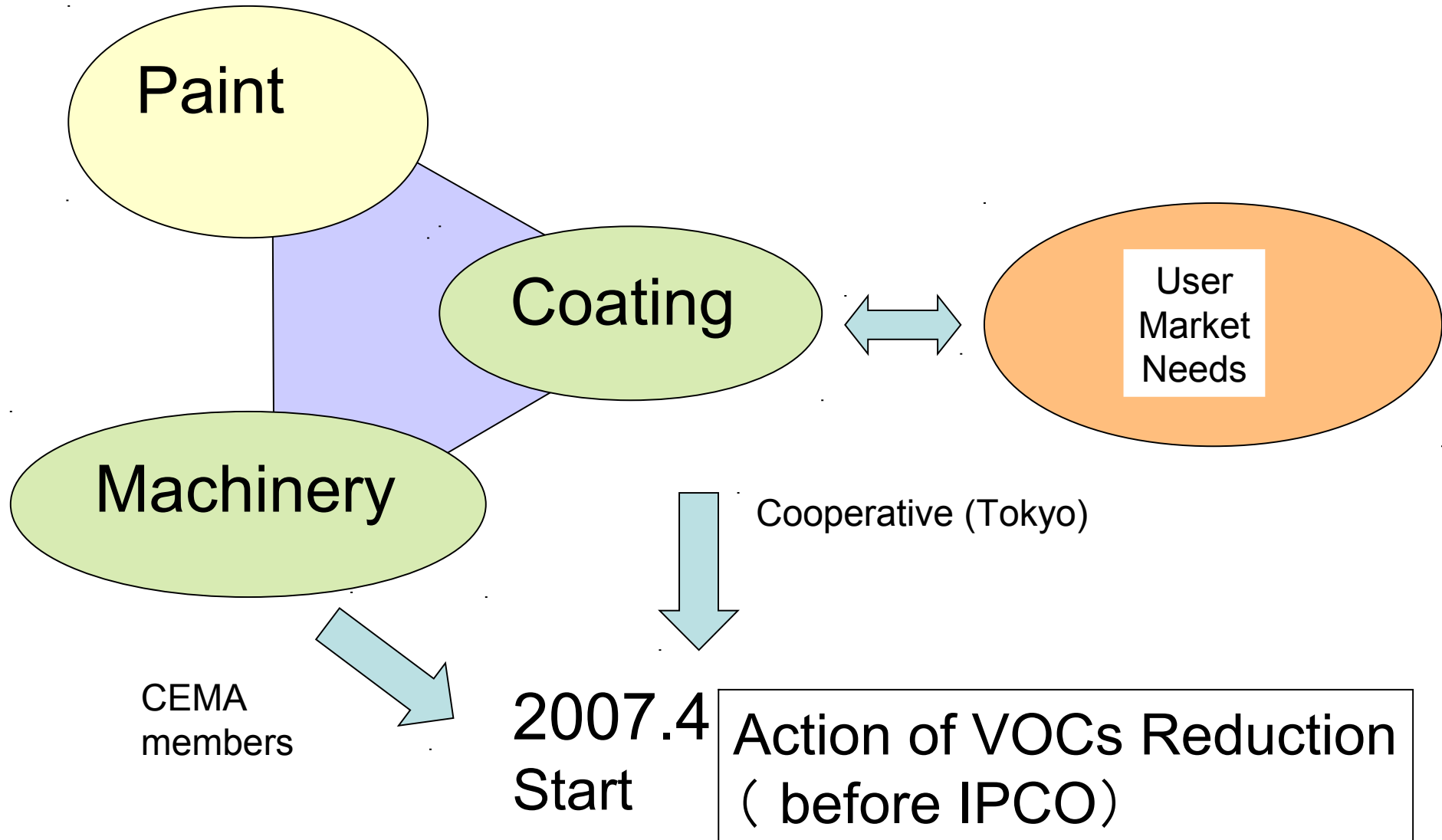
- ・ 2008年 環境技術分科会、CEMA調査
- ・ 第9回CEMA技術シンポジウム発表

1.4 Exp:

Exhaust Gas Treatment Equipment

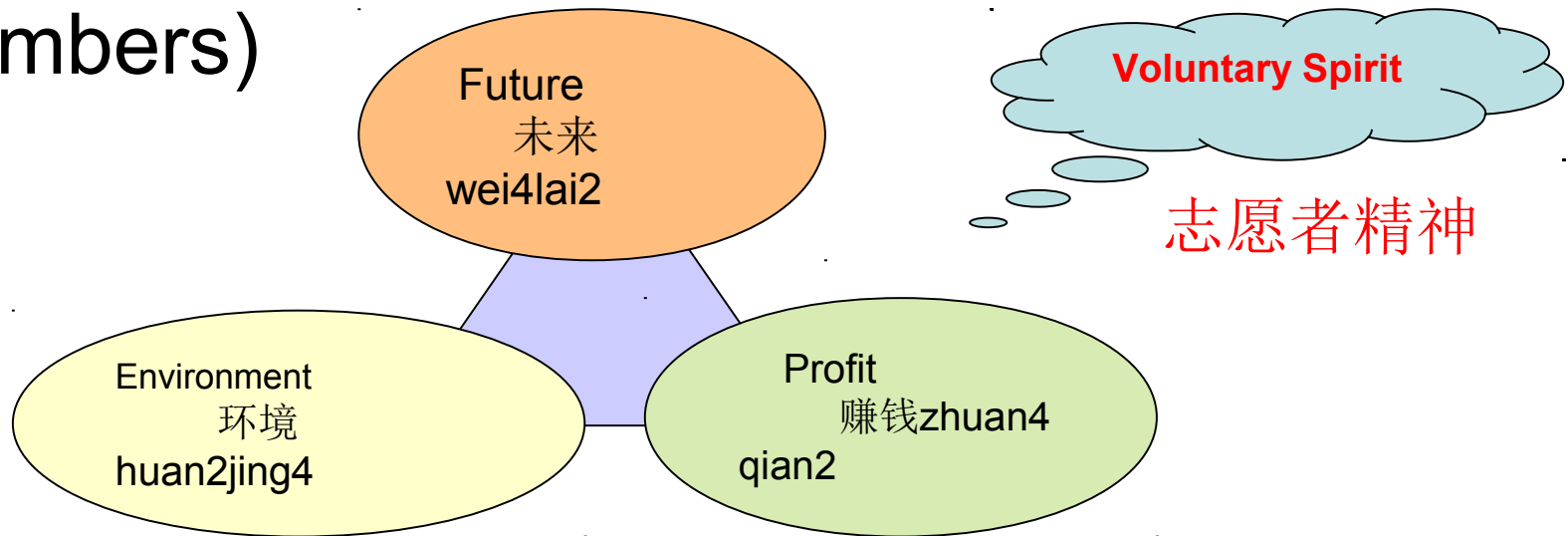


2. Industrial Coating



2.1 Conference of Industrial Coating

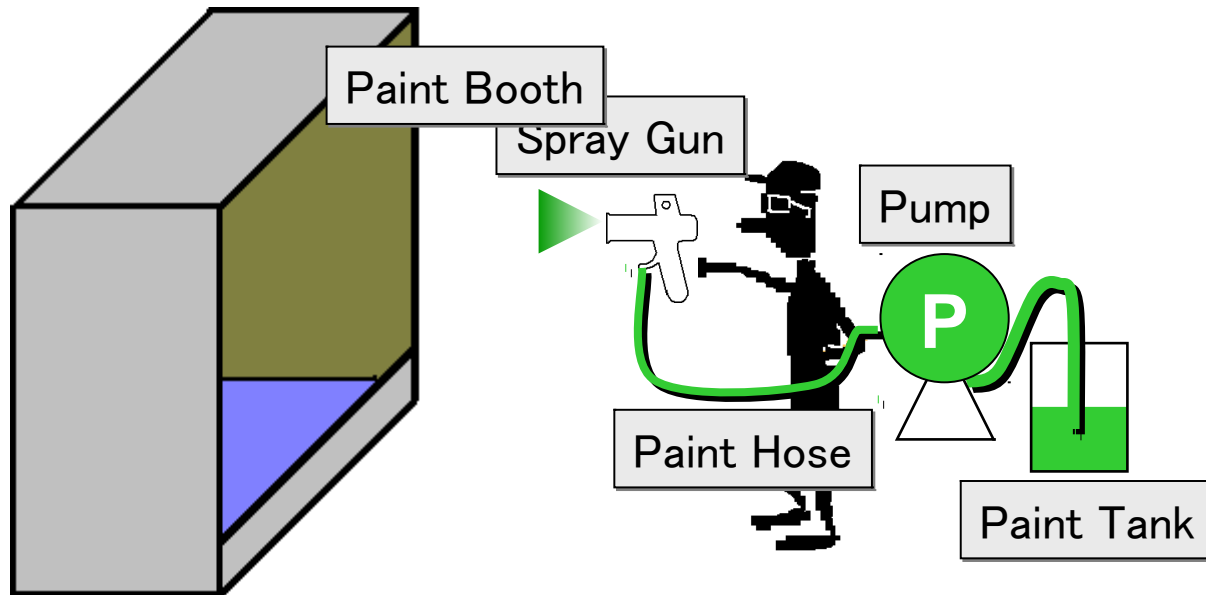
- Coater (Mr. OKADA and some members)
- Cooperator (Mr. HIRANO and some CEMA members)



Now: IPCO (International Promoting Council of Industrial Coating)

2.2 Site Work of Spray Coating

Small and Medium Enterprises



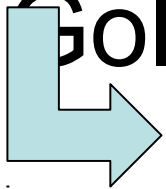
2.3 Keyword of Action

- Kounosuke Matsushita.(松下 幸之助)

song1xia4xing1zhizhu4

xian4chang3

「We'll Make a Profit by VOCs Measures
Gold on the Scene(现场埋藏钱)」



(创新利益由VOCs削减)

Useless, Reuse, Recycle, Not Stereotype

Idea, Idea, Idea!

2.4 Elementary Advice on Site

Before



After



50_{ppm}

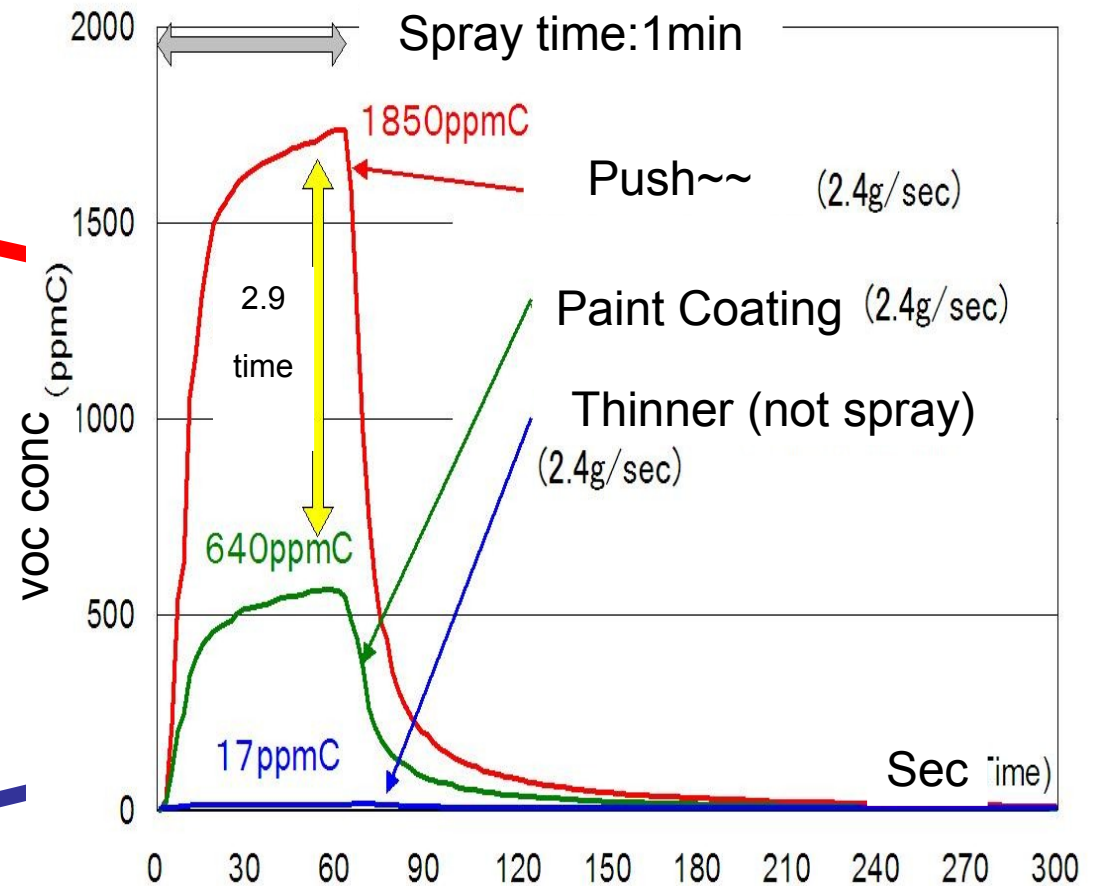
**Convince
by Number**



10_{ppm}

By Tokyo Metro Environ Bureau

2.4 Concentration Measure at Exhaust of Booth



By Tokyo Metro Environ Bureau

2.5 Angle of Spray Gun(角度)

Equal time & weight



Angle 90°

Coating Efficiency 43%

Gloss 94%

Thickness 23μm



Angle 60°

C.E. 36%

Gloss 90%

Thickness 20μm

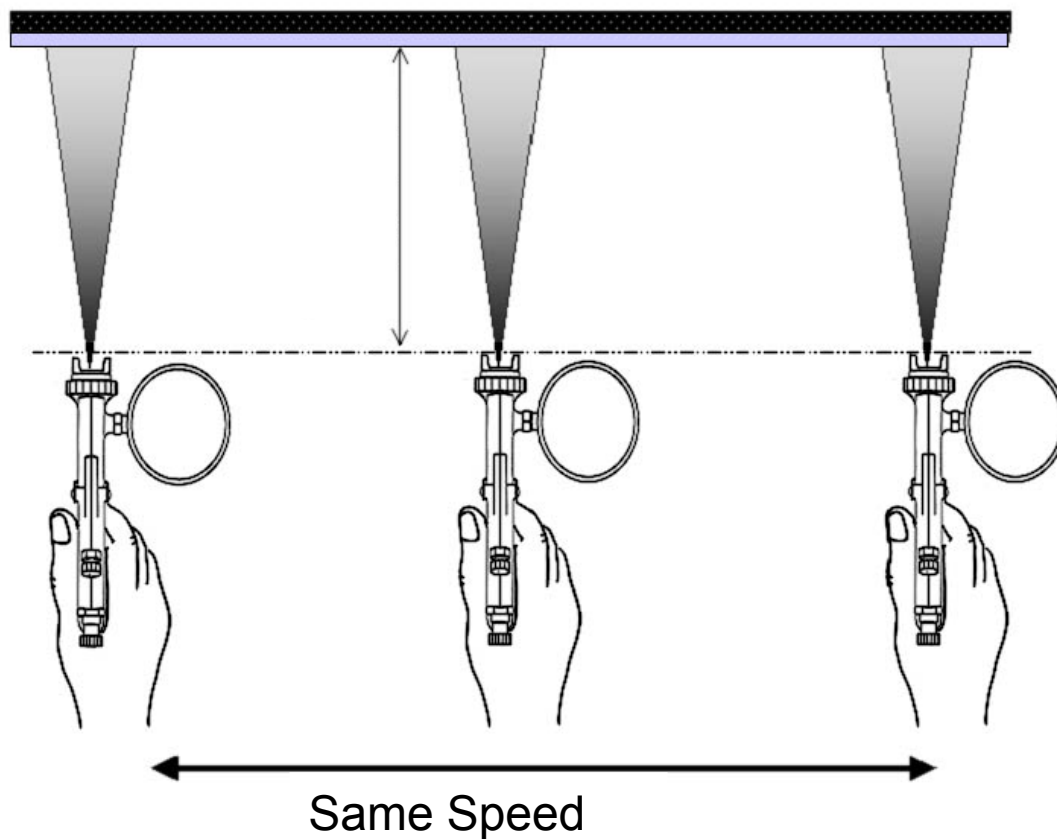
Angle 45°

C.E. 26%

Gloss 37%

Thickness 16μm

2.6 Basic Operation of Spray Gun(距离.速度)



Appropriate Distance


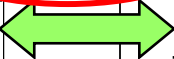

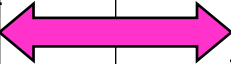


*Large Gun : 20~30cm

*Small Gun : 15~20cm

Operating Speed

: 30~60cm/s

3. Action Plan of Conference for VOCs Reduction(活动计划)

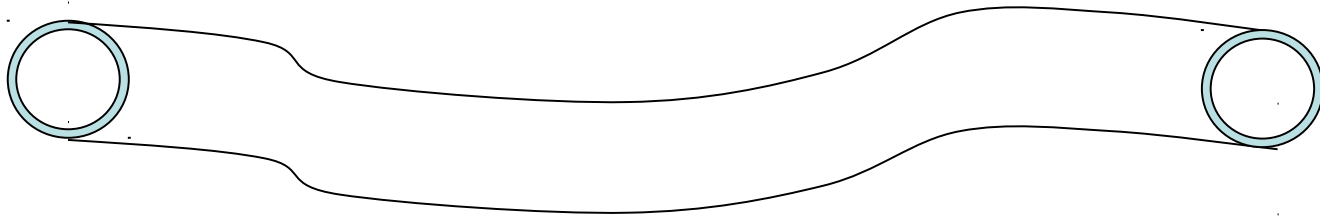
| | 2008 | | | | 2009 | | | | | |
|----------------------------------|--|----|--|----|------|---|---|---|---|--|
| Item | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 |
| Cleaning of Hose&Gun |  | | | | | | | | | |
| Paint Booth |  | | | | | | | | | |
| Waste | | |  | | | | | | | |
| Paints | | | | | |  | | | | |
| Coating Equipment | | | | | | | |  | | |
| Seminar Start “Profit by ECO” | | | | | | | | | |  |

Documents Of VOCs Reduction
are collected on CEMA Website
<http://www.cema-net.com/>

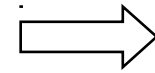
3.1 Case(实例)1

VOCs Measure At Cleaning Time

1. Paint and solvent Amount in Hoses(软管)



$$V = \pi D^2 / 4 \times L$$



Diameter
Length

2. Paint and solvent Amount at Color Change

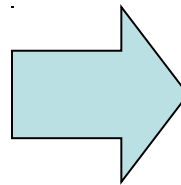


Observation and Consideration

3.1.1 Improvement of Hoses



Entwine



Minimization

3.1.2 Case—1 Solvent Cost (before improve)

Solvent Cost = \$3500/Y

| | |
|---------|---------------|
| Hose | Urethane Hose |
| Dia | 6mm |
| Length | 5m |
| Solvent | Paint Thinner |

280g/1 time

22time/D

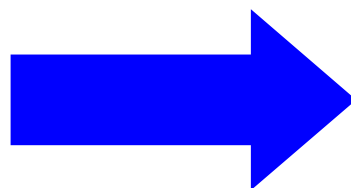
265D/Y

→ 1632,4Kg/Y

3.1.3 Length : 10% Reduction

| | Before | After |
|---------|--------|-------|
| Length | 5m | 4m |
| Solvent | 280g | 250g |

280g
\$0.61



250g
\$0.55

3.1.4 Material and Diameter

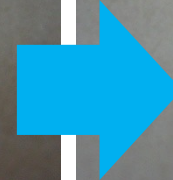
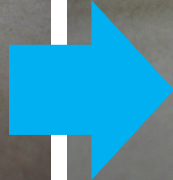
Urethane
 Φ 8-6mm



Teflon
 Φ 8-6mm



Teflon
 Φ 6-4mm



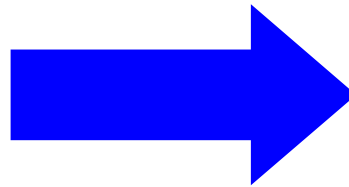
Diameter :4mm
Cleaning Quality: NO

Diameter :4mm
Cleaning Quality:
O.K.

3.1.5 Material : 50%Cost Down

| | 従来 | 改善後 |
|----------|--------------------|------------------|
| Material | Urethane Φ8-6mm | Teflon Φ8-6mm |
| Solvent | 280g | 129g |

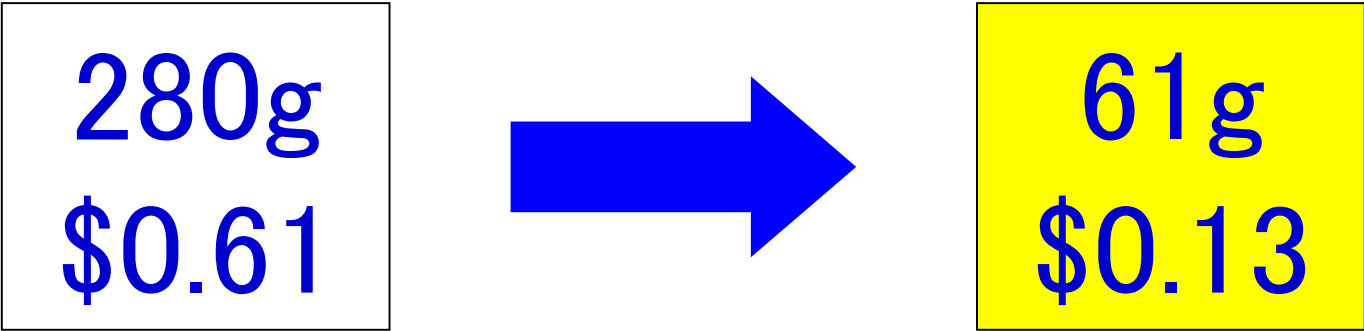
280g
\$0.61



129g
\$0.28

3.1.6 All Result: 80% Cost Down

| | Before | After |
|----------|--------------------|------------------|
| Material | Urethane Φ8-6mm | Teflon Φ6-4mm |
| Solvent | 280g | 61g |



3.1.7 Improvement of Hose

| | Before | After |
|----------------|----------|---------|
| Solvent Weight | 1600kg/y | 350kg/y |
| Cost | \$3500/y | \$76/y |

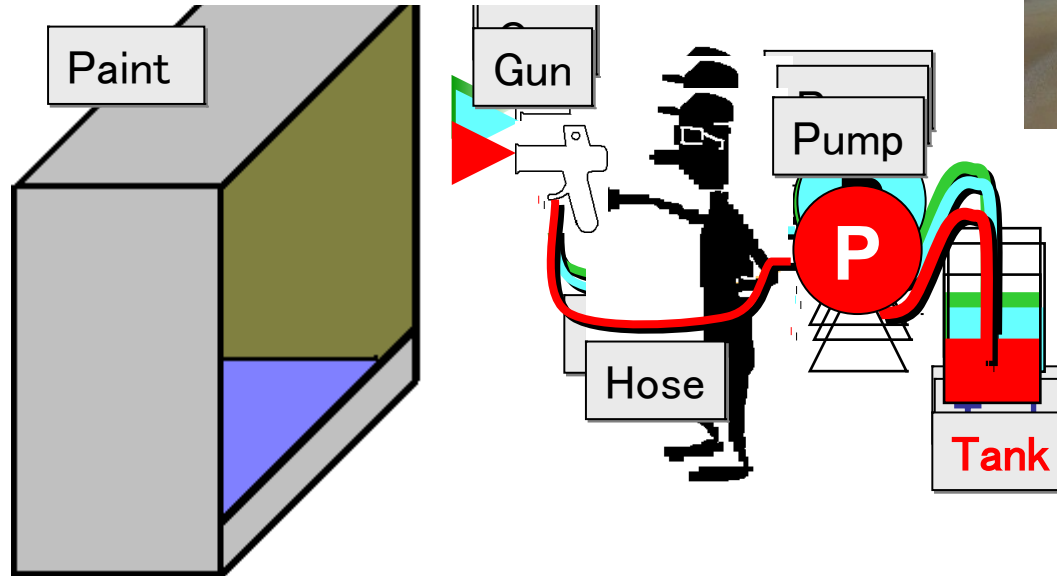
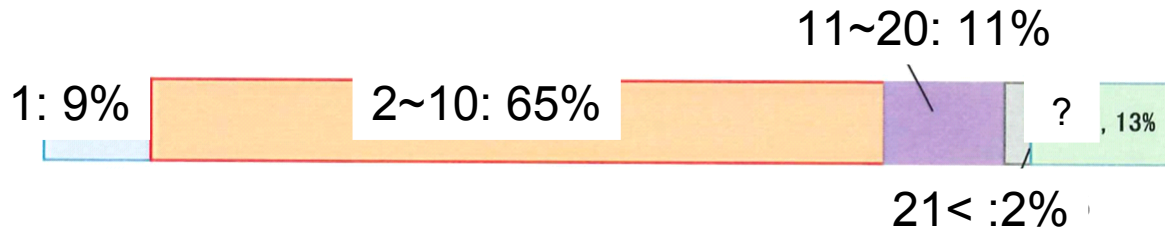
3.2 Case(实例) 2

Color Change(换色时) From oct.2007~dec.2007

- Color Change of Spray Gun

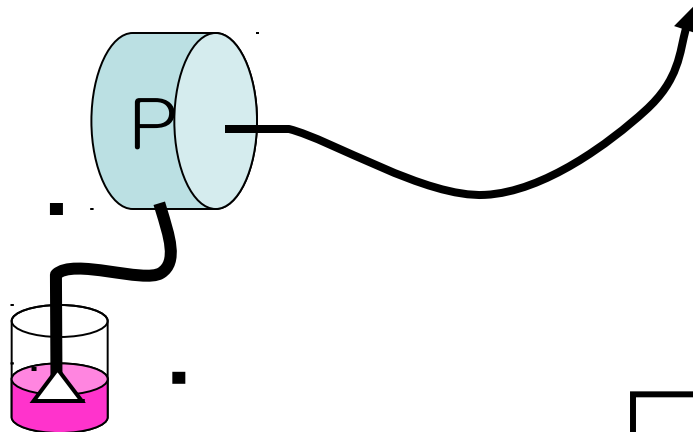


- Color Change Times per Day

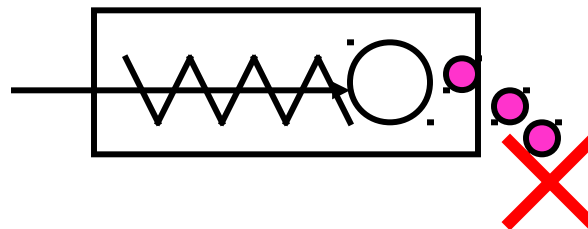


3.2.1 Application of QUICK JOINT

for Color Change

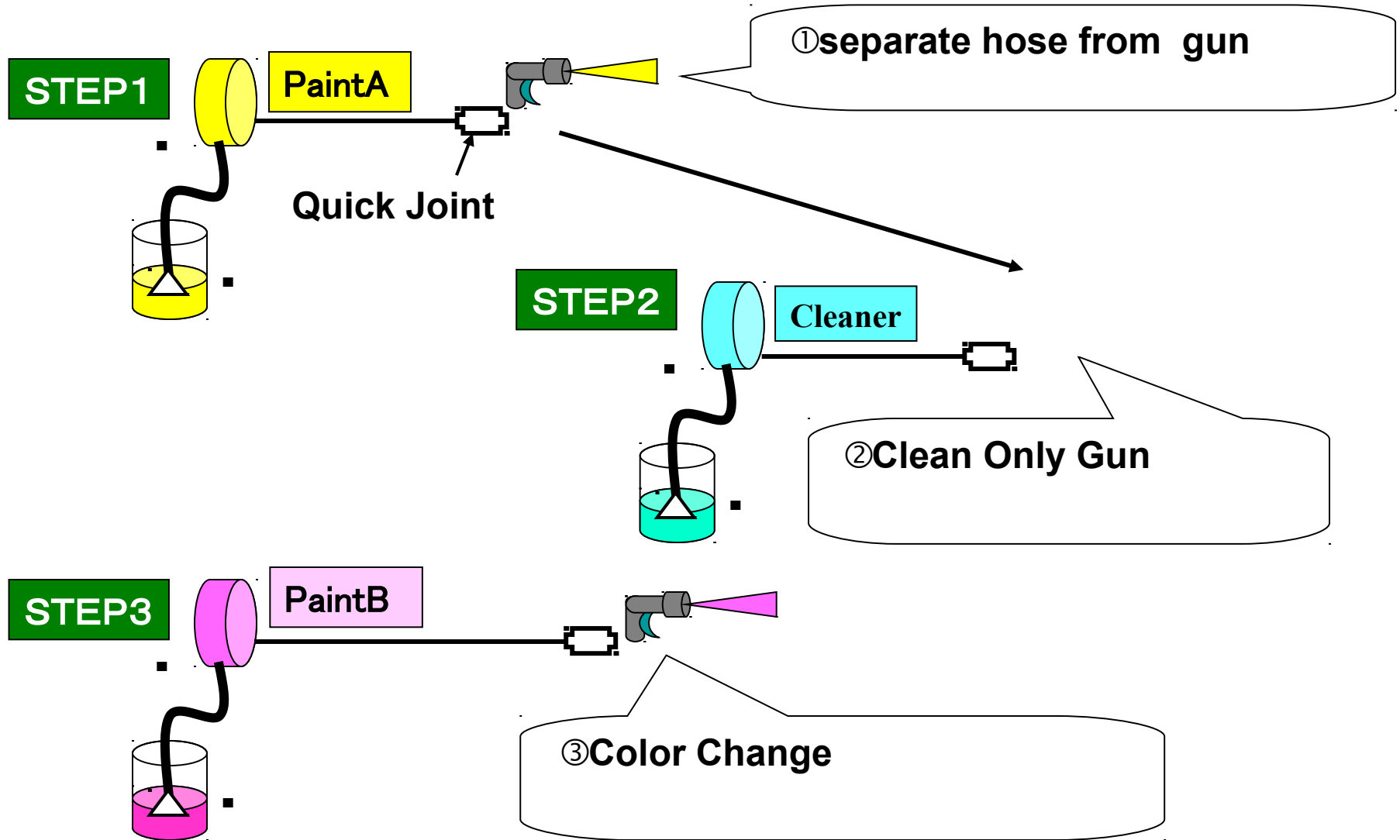


Quick Joint



Check Valve
(non leak)

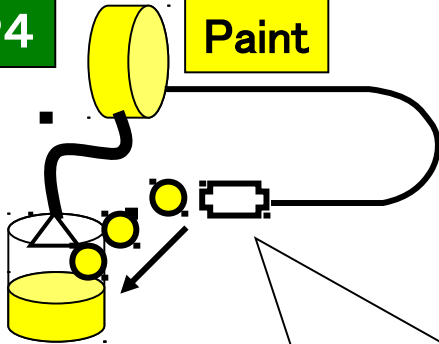
3.2.3 Color Change-1



3.2.4 Color Change-2

STEP4

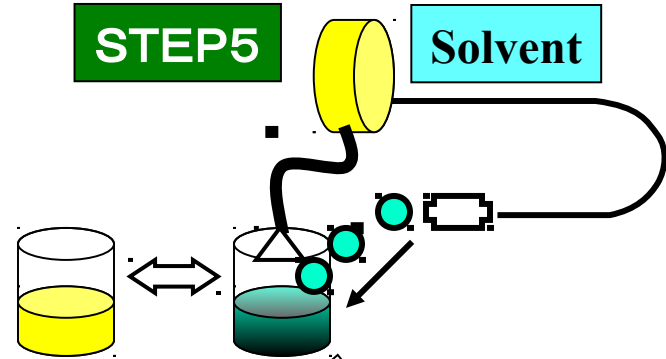
Paint



④Return Paint into Painttank

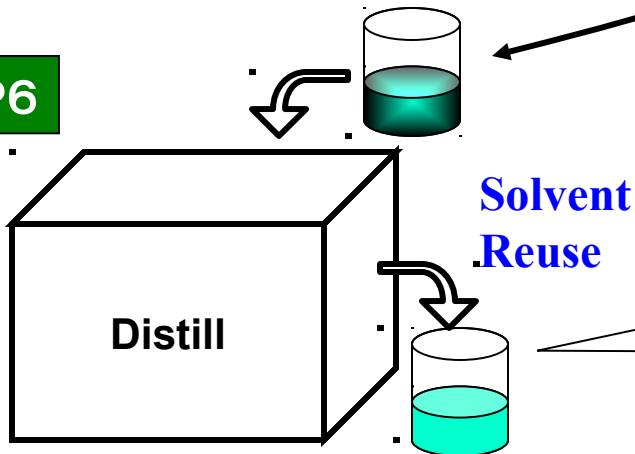
STEP5

Solvent



⑤Clean Hose with Solvent

STEP6

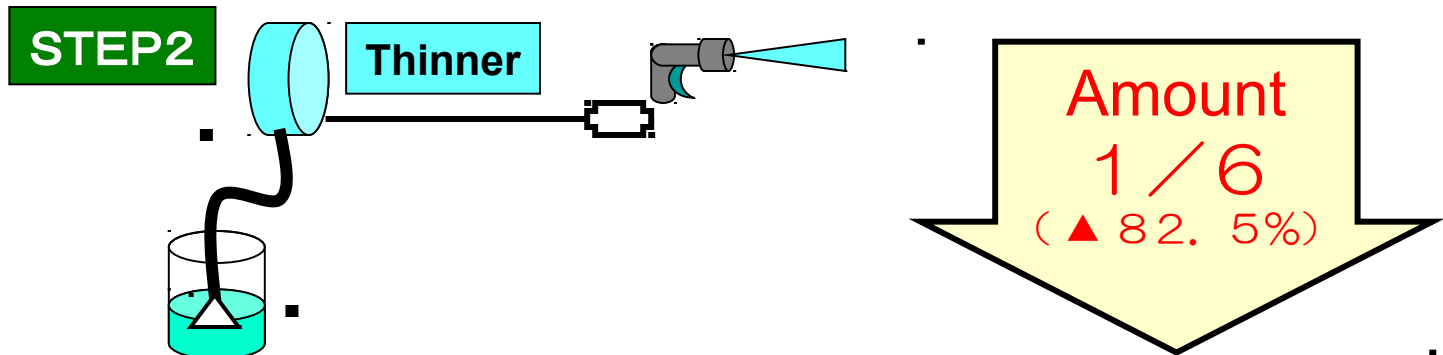


⑥Distillate Cleaning Solution

3.2.5 Result of Line Test

Reduction of Thinner Amount to Use

| Before | 1D | 2th | 3th | 4th | 5th | Average |
|-------------------|----|-----|-----|-----|-----|------------|
| Thinner Waste (g) | 30 | 20 | 30 | 20 | 20 | 24g/1 time |



| After | 1D | 2th | 3th | 4th | Average |
|-------------------|----|-----|-----|-----|-------------|
| Thinner Waste (g) | 2 | 5 | 5 | 5 | 4.2g/1 time |

**1 Line Total
Amount/1time
5QJ /14Gun**

336 g

▲ 34.2%

221 g

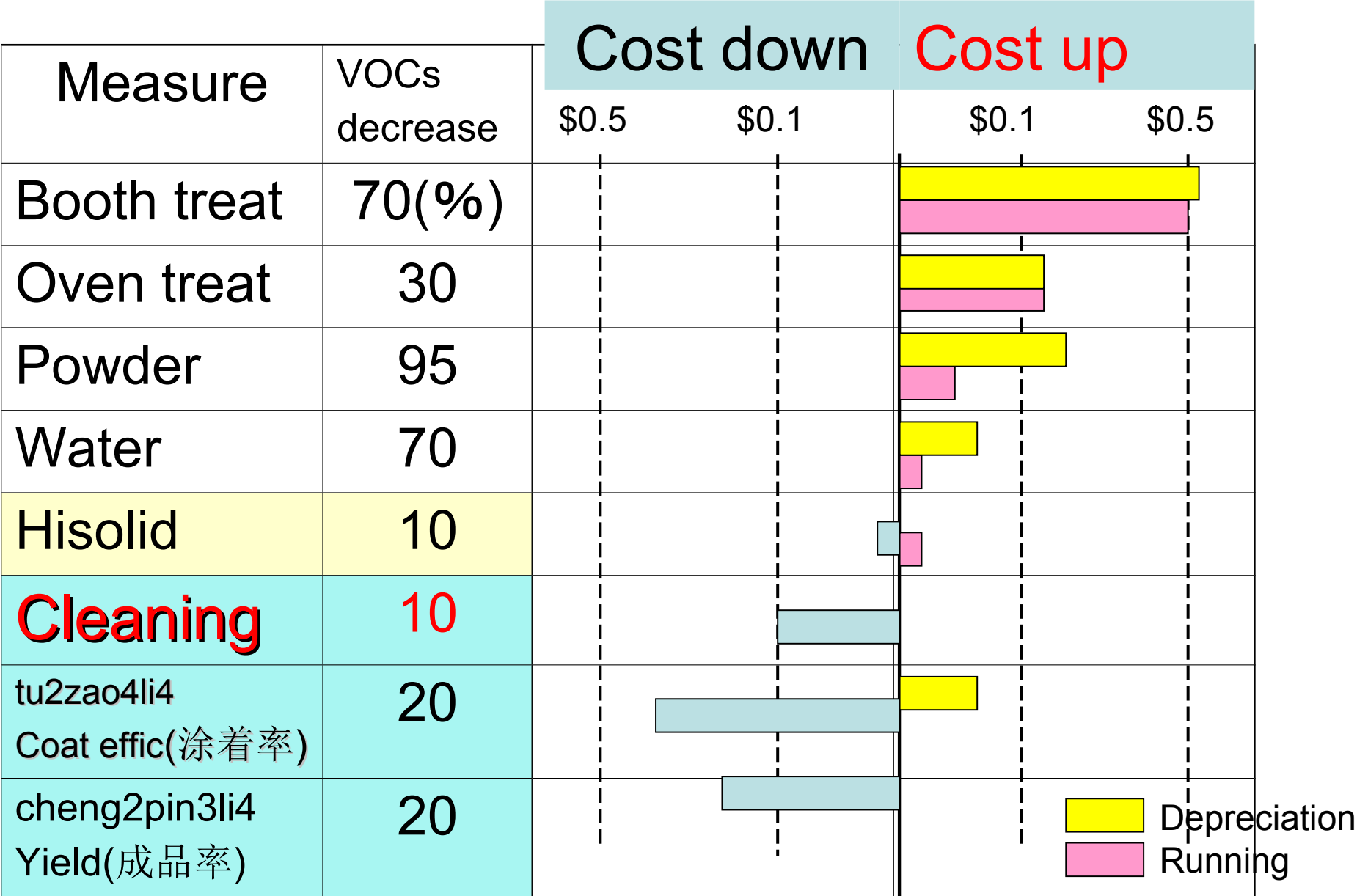
4. Cost Unit(成本的单位)

Cost \Rightarrow Unit Cost

$$\frac{\text{Paint \& Solvent} + \text{Auxiliary Material} + \text{Power} + \text{Delivery} + \text{Labor} + \alpha}{\text{Coating Area (m}^2\text{)}}$$

Unit Cost: per m² \$○○
(or per Unit)

4.1 Actual Unit Cost Changeby Various VOCs Measures



by Ministry of the Environment

○2010年度 功労者特別表彰

| 部 門 | 会社・団体 | 取 組 概 要 |
|--------------------|-----------------------------------|--|
| VOC対策の推進 に資する取組 | 工業塗装高度化協議 会環境技術分科会 (東京都新宿区) | 【工業塗装における環境負荷低減と塗装技術向上に向けた活動】 ○中小企業向け低コスト対策技術の提案と実証。 ○セミナー等による積極的な情報提供・普及啓発活動。 ○産廃のリサイクル化推進、塗装ゾーンにおけるゴミブツ削減によ る効率向上等の推進。 |



NOW

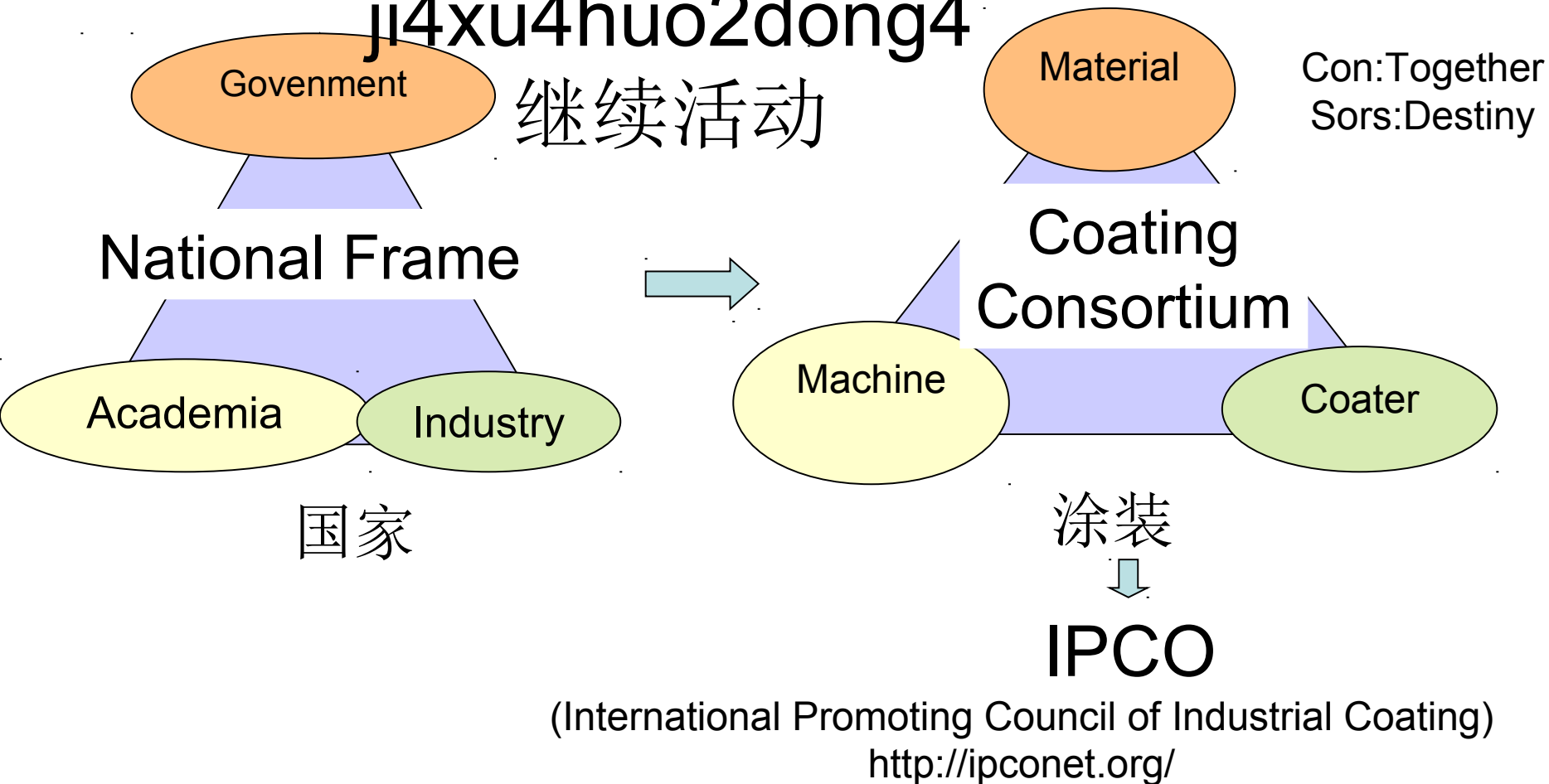
IPCO

(International Promoting Council
of Industrial Coating)

参考資料:2011年2月4日 (環境省 水・大気環境局大気環境課 山田 克之)

Continuous Activity of VOCs Reduction

ji4xu4huo2dong4

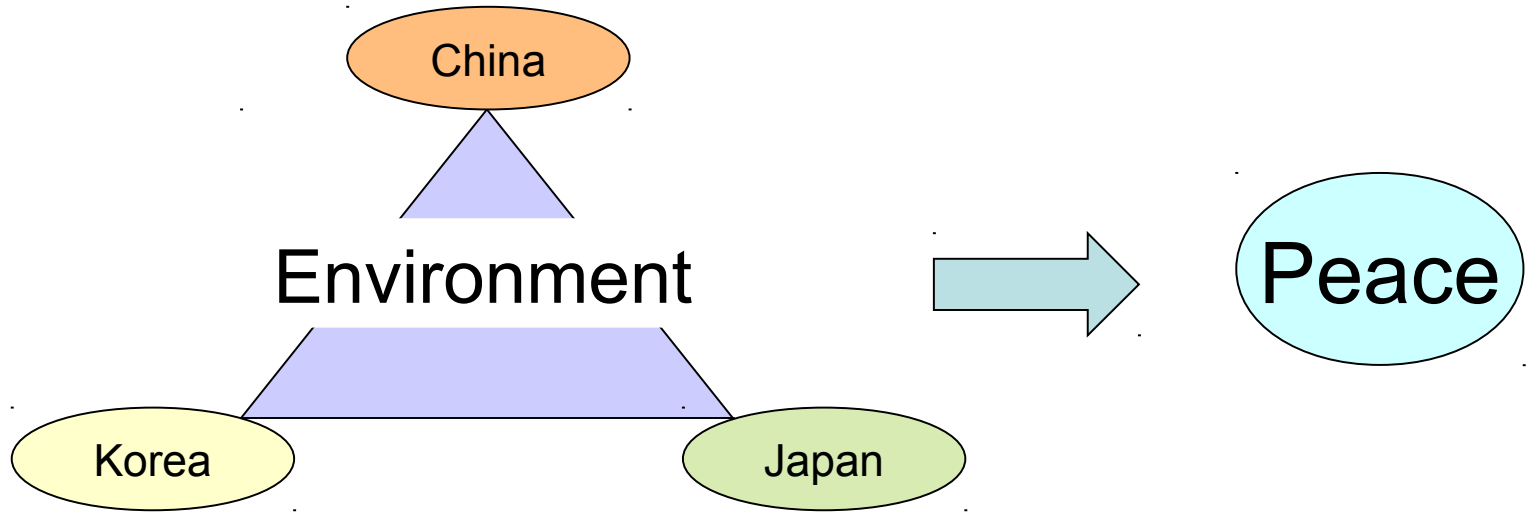


For the Future of Mankind

wei4ledi4qiu2dewei4lai2

为了地球的未来

Summary



gu4gang1tian2

To the late Mr. Okada(故岡田) !

xie4xie

Thank you!(谢谢)