
Introduction to Low-carbon Product certification system

Oct. 2011

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I. Background and Necessity

Carbon Labeling in Korea

- 1 level: Opening information on total carbon emission amount, 2 level: Greenhouse gas reduction product on a basis criteria
- Legal background of implementation
 - Article 57, Framework act on low carbon green growth
 - Article 18, Development of and support for environmental technology act



I. Background and Necessity

Context and Necessity

Why low-carbon product certification system is necessary?

- Acceleration of low carbon consumption culture
 - Green consumption through carbon emission comparison is difficult.
 - There aren't many product to compare product in the same category.

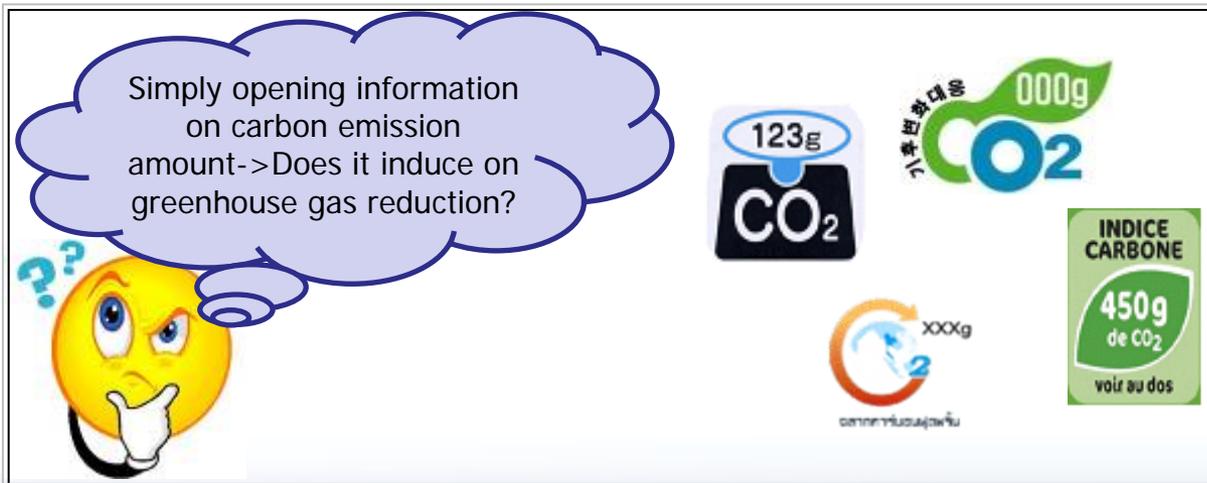


I. Background and Necessity

Context and Necessity

Why low-carbon product certification system is necessary?

- Providing incentives on carbon labeling certification product under governmental policy
 - It is difficult that incentives on product simply opening information on carbon reduction amount.

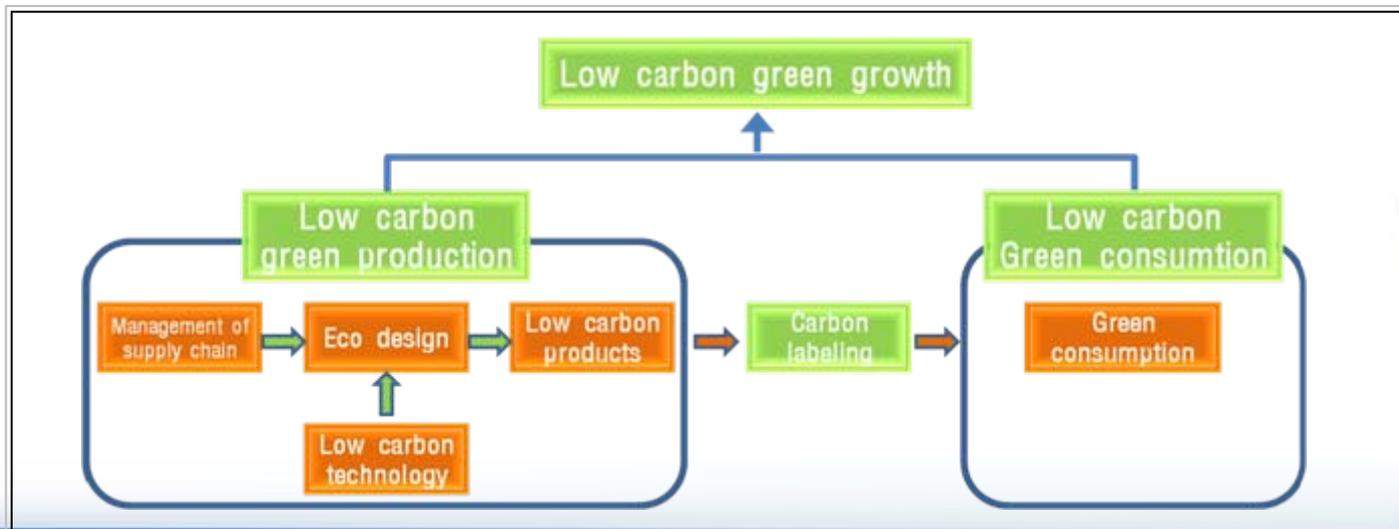


I. Background and Necessity

Context and Necessity

Why low-carbon product certification system is necessary?

- It accelerates improvement of business's low carbon technology.
 - making business's participation expand and speeding up their low carbon product technology through strategic incentive under policy

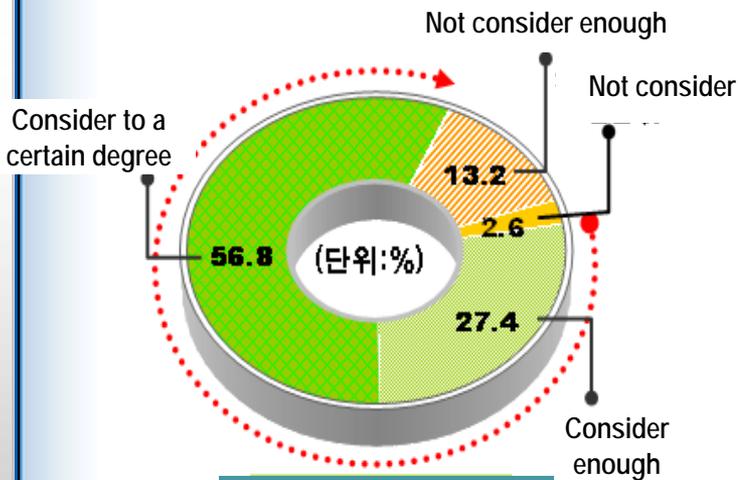


I. Background and Necessity

Context and Necessity

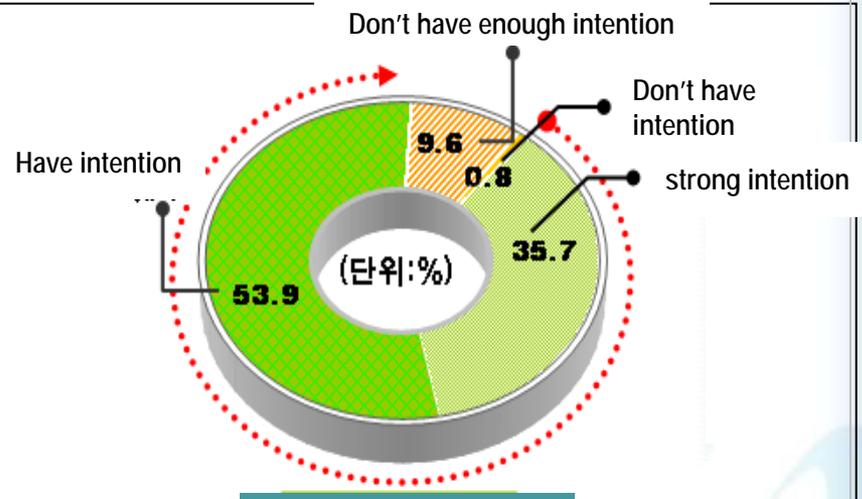
Consumers want to purchase low carbon product

Consideration percent on carbon emission information in case of purchasing product



Consideration 84%

Prior purchasing intention on low carbon product in case of purchasing products



Purchase 89.6%

▶ If carbon emission amount is presented on product, 84% answered they would consider it.

▶ In case of purchasing product, 89.6% answered they would low carbon product as priority.

I. Background and Necessity

Adoption Effect

1,000 low carbon products certification,
about 1.12 million tons of CO₂ reduction in a year,
Planting effect of 40 thousands pine trees

Increasing
consumer's
green
consumption
convenience

Accelerating low
carbon
consumption
culture and low
carbon
technology
development

Inducing
businessman's
greenhouse
gas reduction
*** Providing
incentives by
reduction.**

Greenhouse
gas reduction
in nation

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II. Certification guidance of Low carbon product

Development Direction

- Basic rule is to establish guidance among the interested parties in the range of satisfying government, business, and social demand.
- Final object is to contribute steady green growth and low carbon society.

Contribution on lasting green growth and low carbon society

Government

- Contributing the government's greenhouse reduction objective in 2020.

Business

- Intending the top level low carbon technology
- Reflecting business's low carbon endeavor

Society

- Making consumer easily recognizable
- Contributing to change social consideration

Establishing certification criteria on low carbon product reflecting the interested parties' opinion

II. Certification guidance of Low carbon product

Current development

Yearly development of system adoption

2009

- Making direction on certification criteria and roadmap for low carbon product certification
 - Feasibility test on method of low carbon product certification criteria and direction

2010

- Establishing general criteria of low carbon product certification and presenting demonstration certification
 - Making a draft of low carbon product guidance (criteria on the minimum carbon emission amount and carbon reduction ratio)
 - Testifying carbon reduction on 13 products and price benefit analysis

2011

- Building and enforcing regulation on low carbon product certification
 - Adjusting regulation on low carbon product certification system and guidance, gathering opinion on the system and notifying preliminary and final regulation.
 - Opening the first certification product ceremony and enforcing the system(Nov.2011)

II. Certification guidance of Low carbon product

Main Contents

| | |
|---|--|
| Object product | <ul style="list-style-type: none"> ▪ It includes carbon emission amount certification product per low carbon product certification object category in Appendix 1 of low carbon product certification guidance ▪ Other detailed condition is decided on detailed regulation of carbon grade cover management |
| Certification criteria | <ul style="list-style-type: none"> ▪ Minimum carbon emission amount and the basic value of minimum carbon reduction ratio for low carbon product certification valuation are followed by Appendix 2 |
| Calculation of carbon emission | <ul style="list-style-type: none"> ▪ Calculation of carbon emission amount for low carbon product certification application are followed by carbon labelling guidance 1, 2,3. ▪ However, calculation criteria (functional unit) is decided by criteria unit per product category in Appendix 2. ▪ Site data collecting in normal condition for more than 3 months is necessary for data quality requirement |
| Low carbon product certification | <ul style="list-style-type: none"> ▪ Minimum carbon emission amount and carbon reduction ratio criteria value should be satisfied. ▪ In case of not applied and not included in Appendix 2 of minimum carbon emission amount criteria, even if it is satisfying the minimum carbon reduction ratio criteria, it is admitted as low carbon certificate product. |

Appendix 1 : carbon emission certification product as low carbon product certification object per category group

Appendix 2 : minimum carbon emission amount per product category and minimum carbon emission reduction ratio criteria

II. Certification guidance of Low carbon product

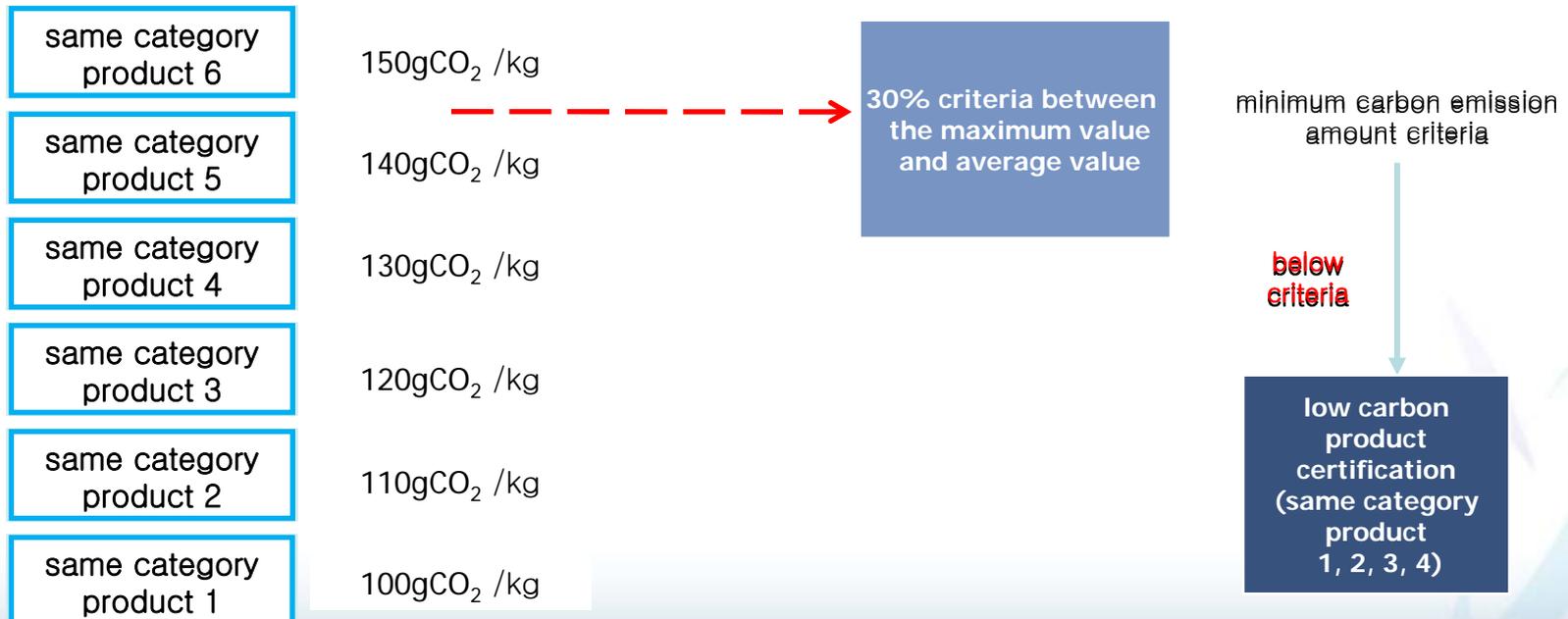
Concept of minimum carbon emission amount

Minimum carbon emission amount criteria = A average + (A max – A average) × k %

A average : same category product's carbon emission amount by won unit average

A max : same category product carbon emission amount by maximum won unit

k : reduction ratio variable, k value is applied as 0.3, 0.2, 0.1 yearly since Nov. 2011.



II. Certification guidance of Low carbon product

Basic concept 1 of the minimum carbon emission reduction ratio

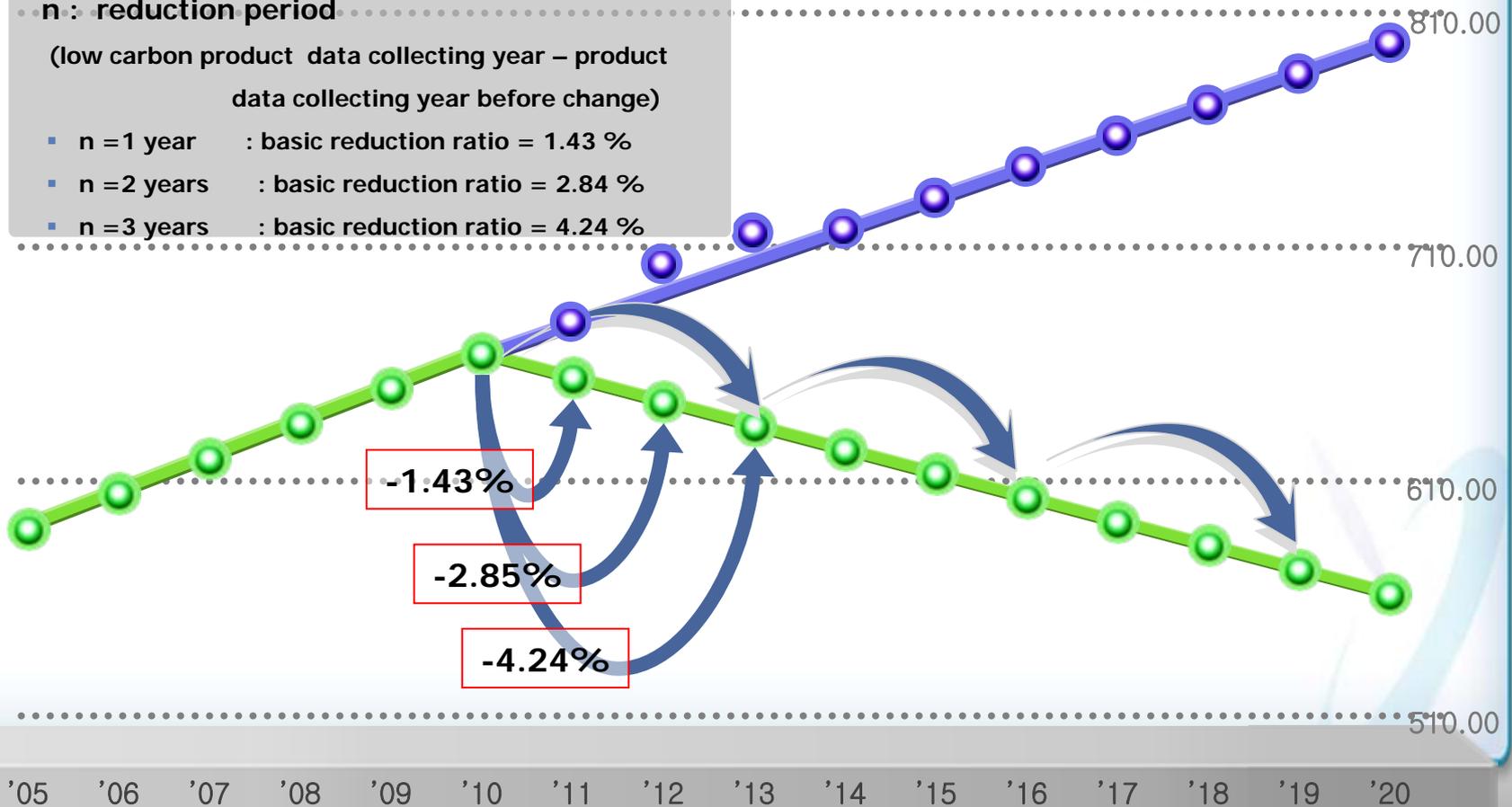
$$\text{basic reduction ratio} = 1 - (1 - 1.43\%)^n$$

n : reduction period

(low carbon product data collecting year – product data collecting year before change)

- n = 1 year : basic reduction ratio = 1.43 %
- n = 2 years : basic reduction ratio = 2.84 %
- n = 3 years : basic reduction ratio = 4.24 %

BAU basic reduction ratio applying



II. Certification guidance of Low carbon product

Basic concept 2 of the minimum carbon emission reduction ratio



* Calculation of reduction objective ratio per product

- ◆ Setting reduction objective ratio per product by contribution level of emission amount during total process before improving per product

$$\text{◆ } RR = (ER_{\text{before manufacture level}} + ER_{\text{usage level}} + ER_{\text{end of life level}}) * RR_{\text{basic}} + ER_{\text{manufacture level}} * RR_{\text{business type}}$$

* Terminology definition

- ◆ **Basic reduction ratio (RR_{basic})** : Commonly applied reduction ratio on every product, based on government's greenhouse reduction goal
- ◆ **Business type reduction ratio ($RR_{\text{business type}}$)** : Applying reduction objective ratio in case of business type of objective management system, and applying basic reduction ratio in case of not including business type and no objective year
- ◆ **Emission Ratio before improvement (ER)** : emission ratio per level during all process

II. Certification guidance of Low carbon product

Basic value of low carbon product certification

- low carbon product certification guidance (Article 7 of business regulation)
- Revising twice a year low carbon product certification guidance per same category product (Article 7 of business regulation)

In case of not applying, just satisfying minimum carbon reduction ratio criteria

| Section | Large assortment | Medium assortment | Detail assortment | Basic unit | Minimum carbon emission amount criteria | Minimum carbon reduction ratio criteria |
|---------|------------------|---|-----------------------------------|----------------------------------|---|---|
| 1 | 1 type | fertilizer, soil for cultivating plant (category) | fertilizer | gCO ₂ /product 1kg | not applying | 4.24% |
| 2 | 2 type | print ink (category) | toner resin for dry type printing | gCO ₂ /product 1kg | 2,667 | 4.24% |
| 3 | 3 type | | shampoo | | 98 | 4.24% |
| 4 | 3 type | body soap, face soap (category) | liquid body soap | gCO ₂ /contents 100ml | 93 | 4.24% |
| 5 | 3 type | | Hair rinse | | not applying 미 적용 | 4.24% |

Checking object product in appendix 1 of certification guidance per item category

Calculating emission amount per 100ml product contents

Diminishing 4.24% of total carbon emission amount

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III. Demonstration certification

Demonstration certification product

- 13 businesses and 13 products among carbon emission amount certification products



white sugar



bean-curd



shampoo



TFT-LCD glass



flight service



washing machine



cooked rice



tap water



wardrobe



detergent



water purifier



refrigerator



coca-cola

III. Demonstration certification

Demonstration certification result

| product | greenhouse gas reduction technology | reduction ratio (life cycle stage) |
|---|--|--|
|  | <ul style="list-style-type: none"> ▪ Replacing B-C oil and boiler kerosene partly with LNG during manufacturing process ▪ Replacing collecting waste heat with using steam during heating water | <p>3.4% (manufacturing level)</p> |
|  | <ul style="list-style-type: none"> ▪ Reducing 21% weight through changing packaging film from 4 types to 2 types ▪ Saving fuel by recycling indirect cooling water instead of hot water as manufacturing soymilk | <p>4.2% (before manufacture, manufacturing level)</p> |
|  | <ul style="list-style-type: none"> ▪ Decreasing container and cap weight ▪ Changing old pipe type boiler | <p>5.1% (before manufacture, manufacturing level)</p> |
|  | <ul style="list-style-type: none"> ▪ Growing productivity and lessening electricity by simplifying process ▪ Recycling law materials | <p>23.5% (before manufacture, manufacturing level)</p> |

III. Demonstration certification

Demonstration certification result

| product | greenhouse gas reduction technology | reduction ratio (life cycle stage) |
|---|--|---------------------------------------|
|  | <ul style="list-style-type: none"> Improvement of engine performance adopting new engine washing machine Weight reduction through engine loading policy to decrease fuel remaining amounts | 3.5% (manufacturing level) |
|  | <ul style="list-style-type: none"> Fuel replacing LNG with steam using waste heat in work place Shortening using operating hours of cooling machine during winter season and raising cooling water temperature | 23% (manufacturing level) |
|  | <ul style="list-style-type: none"> Reducing electric power consumption as adding foam in hot water tank insulator | 8.6%(usage level) |
|  | <ul style="list-style-type: none"> Changing washing drive system and shortening heating hour Enlarging washing capacity from 12kg to 13kg | 9% (usage level) |

III. Demonstration certification

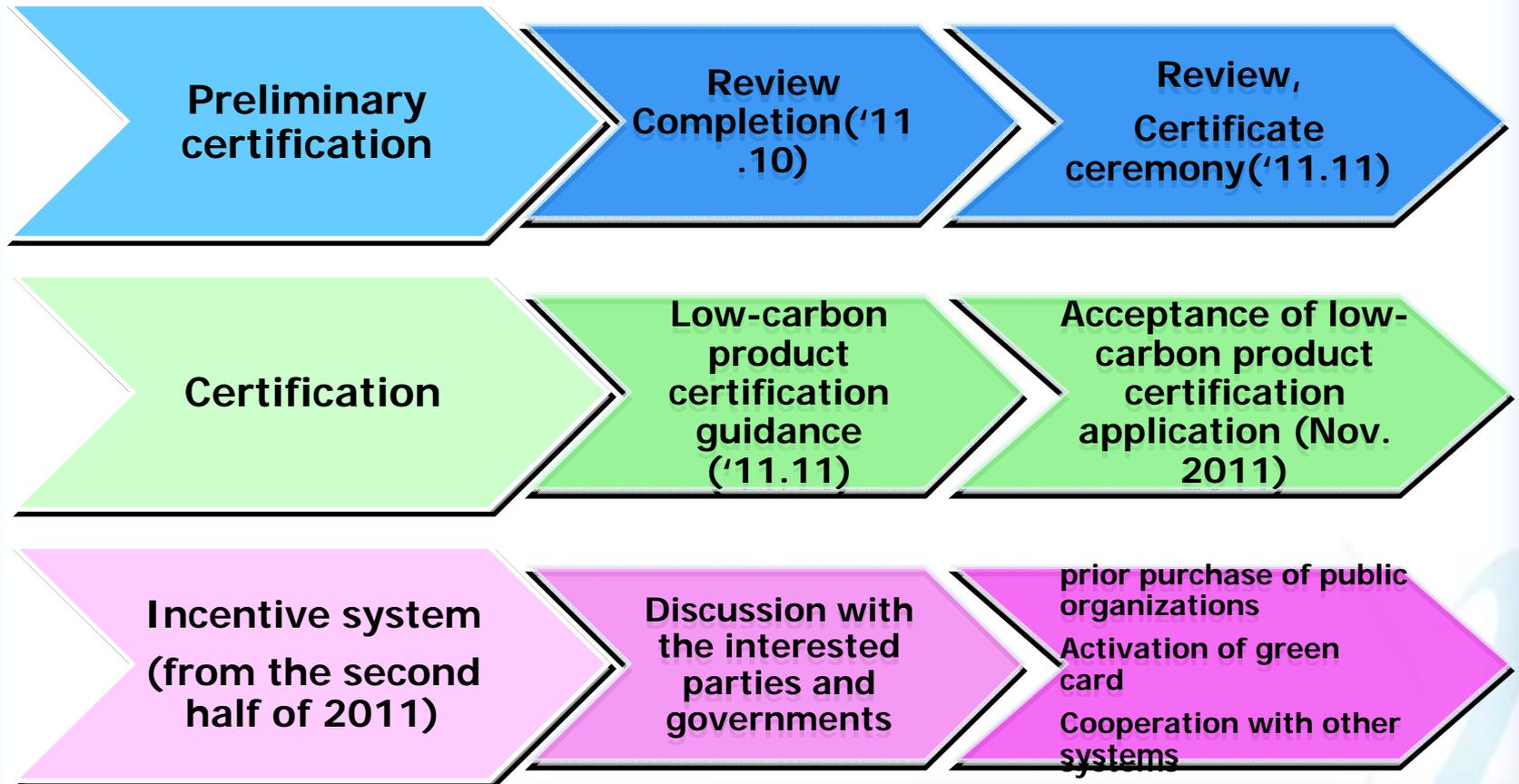
Review on demonstration certification

Review Regulation

- **Review on carbon emission amount should follow carbon labelling guidance 1, 2, 3**
- **Technical verification of greenhouse gas reduction during review on carbon reduction emission**
 - **must prove evidence of correlation between greenhouse gas reduction and applied low carbon technology**
 - **admit reduction amount only by site data collection except for raw and subsidiary materials change**
 - **apply separately greenhouse gas reduction due to unintentional natural change and applying low carbon technology**
 - **In case it is uncertain that low carbon technology is applied or not for carbon reduction, bring up it to the certification and review committee.**
 - **Without improvement of distribution, greenhouse gas reduction isn't admitted according to purchase chance per region (contribution level).**

III. Demonstration certification

Future Schedule





Thank you!

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