Ecolabels in SPP for Construction Works

Ecolabels play a critical role in enabling effective and credible Sustainable Public Procurement (SPP) for construction works. In the construction sector—where materials such as cement, steel, aggregates, and building products account for a significant share of environmental impacts—procuring entities require **reliable, verifiable, and standardised environmental information** to support procurement decisions.

Incorporating ecolabels into construction procurement allows public agencies to identify environmentally preferable materials and services without conducting complex technical assessments for every tender. Ecolabels translate life-cycle environmental performance into practical procurement tools, ensuring that environmental requirements are transparent, non-discriminatory, and aligned with national and international standards.

Under Thailand's SPP framework, recognised ecolabels—such as the **Green Label** and **Carbon Label**—provide assurance that construction materials meet defined criteria on resource efficiency, pollution prevention, and greenhouse gas emissions. These labels are complemented by **Environmental Product Declarations (EPDs)**, which disclose quantified life-cycle environmental impacts in accordance with ISO standards. Together, ecolabels and EPDs enable procuring entities to integrate **Life-Cycle Assessment (LCA)** and **Life-Cycle Costing (LCC)** into tender specifications, award criteria, and contract management.

The use of ecolabels in construction procurement supports multiple policy objectives. It reduces environmental impacts across the construction life cycle, strengthens transparency and accountability in public spending, and sends a clear market signal that encourages manufacturers and contractors to invest in low-carbon and environmentally sound products. When systematically applied through public procurement, ecolabels become a strategic instrument for driving innovation, improving environmental performance in infrastructure development, and supporting Thailand's transition toward a low-carbon and circular economy.

Ecolabel in SPP Guideline for Construction works

A SPP construction works must:

- Minimise **life-cycle CO_2**
- Use **eco-labelled / EPD-verified materials**
- Reduce **energy, water, waste, toxic materials**
- Be evaluated on **whole-life cost**, not cheapest bid

Scope

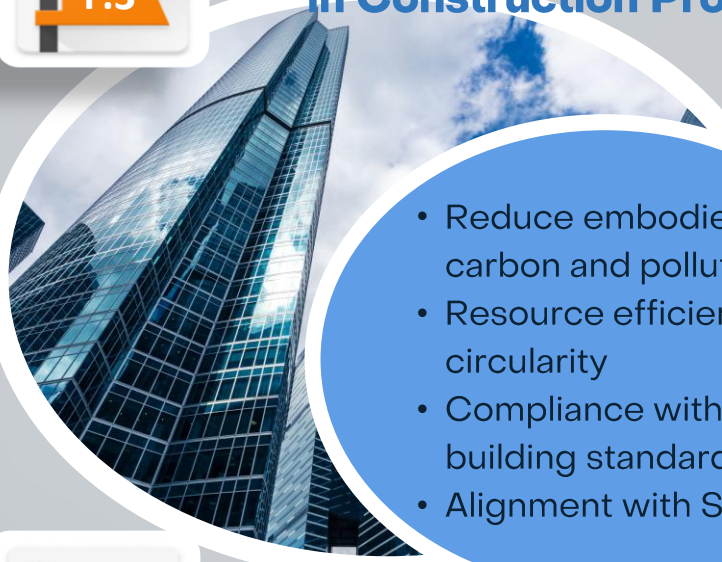
Applies to:

- Roads, bridges, buildings
- Water and irrigation systems
- Public housing and facilities

Tools:

- Ecolabels [Green label, CFP, EPDs]
- LCA / LCC
- CO_2, energy and materials tracking

Ecolabels in SPP for Construction Works



- Reduce embodied carbon and pollution
- Resource efficiency and circularity
- Compliance with Green building standards
- Alignment with SDG12

Integration framework

Policy/Strategic

Incorporate ecolabel requirements into sustainable procurement policy

Operational/ Procedure

Include ecolabel criteria in tender documents, evaluation and contract clauses

Technical/product

Apply specific ecolabel standards or Type I Ecolabel criteria

Where to apply Ecolabel criteria

Design stage

Integrate or Specify use of materials that meet ecolabel or equivalent criteria

Tendering & Evaluation

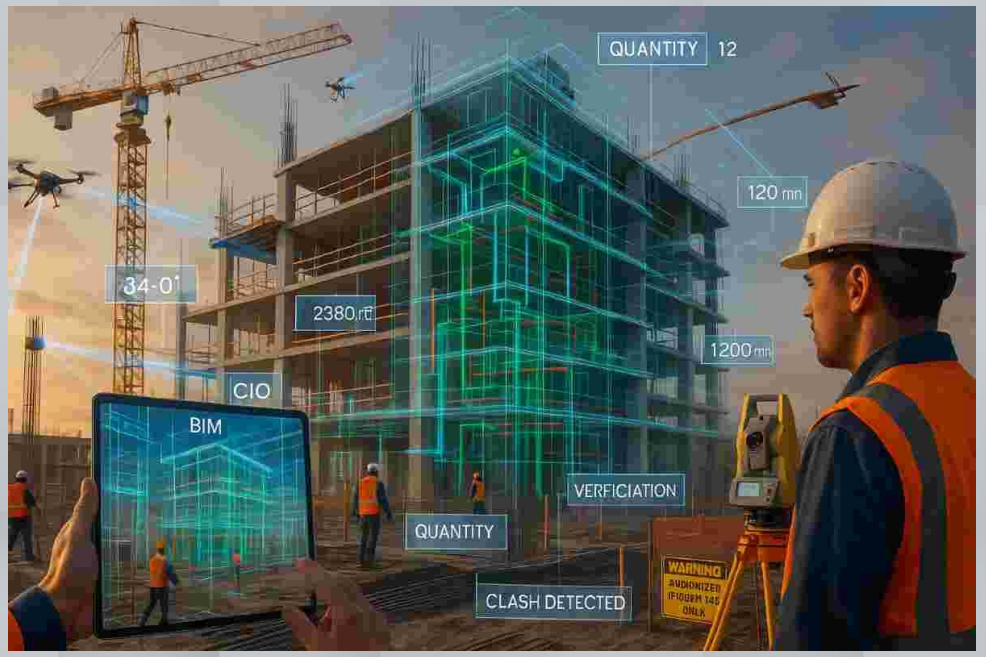
Include ecolabel compliance as technical specifications or award criteria

Contract implementation

Require suppliers to maintain ecolabel certification or provide equivalent proof throughout the contract

Why Integrate Ecolabel Criteria in Construction Procurement

Public procurers often face **technical, legal, and administrative barriers when implementing Sustainable Public Procurement** (SPP). Ecolabels provide a practical, ready-made solution that simplifies sustainability integration across the procurement cycle.



https://www.constructionplacements.com/phases-of-the-construction-project-life-cycle/

Construction has a large environmental footprint — from material extraction to demolition. Integrating **ecolabel criteria** ensures that materials, products, and construction practices meet **verified environmental performance standards**, helping achieve:

1. Reduced embodied carbon and pollution
   READ MORE
2. Resource efficiency and circularity (recycled, certified materials)
   READ MORE
3. Compliance with green building standards (e.g., LEED, TREES, BREEAM)
   READ MORE
4. Alignment with SDG 12 (Responsible Consumption and Production)
   READ MORE

Why Integrate Ecolabel Criteria in Construction Procurement

1. Reduced embodied carbon and pollution

How ecolabel helps:

- **Life Cycle Assessment (LCA)–based criteria** quantify carbon emissions and pollutants from raw material extraction to end-of-life stage.
- Standards set **maximum allowable CO_2 emissions**, clinker ratios, energy consumption, and pollution limits for cement, steel, and other materials.
- Verified ecolabels require:
  - Low-emission production technologies
  - Cleaner fuels or renewable energy
  - Pollution controls (e.g., dust filters, NO_x reduction)

Outcome:

Materials with verified ecolabel or EPD show **measurably lower embodied carbon** and fewer air/water pollutants compared to conventional products.

Why Integrate Ecolabel Criteria in Construction Procurement

2. Resource efficiency and circularity (recycled, certified materials)

How ecolabel helps:

- Standards require **minimum recycled content** (e.g., slag, fly ash in cement; scrap in steel).
- Verified ecolabels check:
  - ❑ Efficient use of raw materials
  - ❑ Reduced waste generation
  - ❑ Water efficiency and reuse
  - ❑ Certified sustainable sourcing of wood, aggregates, or inputs
- They also support **design for circularity**, ensuring materials can be reused or recycled.

Outcome:

Construction materials use **fewer virgin resources**, promote **closed-loop systems**, and reduce overall environmental footprints.

Why Integrate Ecolabel Criteria in Construction Procurement

3. Compliance with green building standards (e.g., LEED, TREES, BREEAM)

How verification helps:

- Green building rating systems award credits for:
  - ❑ Use of certified low-carbon materials
  - ❑ Products with Type I ecolabels
  - ❑ EPD-backed materials (LEED Material & Resources credits)
  - ❑ Low-VOC paints, adhesives, and coatings
- Verified documentation **simplifies compliance**, because ecolabel criteria align with building certification requirements.

Outcome:

Using verified ecolabel materials directly contributes to achieving **higher building certification scores**, improving environmental performance and market value.

Why Integrate Ecolabel Criteria in Construction Procurement

4. Alignment with SDG 12 (Responsible Consumption and Production)

How ecolabel helps:

- Verified standards promote **transparent, traceable, and responsible production**.
- They encourage:
  - Sustainable material sourcing
  - Cleaner manufacturing
  - Waste reduction
  - Lower emissions
  - Responsible end-of-life management
- Governments and organizations use verified ecolabels in procurement to implement **SDG 12.7: "Promote public procurement practices that are sustainable.'**

Outcome:

Construction projects align with international sustainability goals and demonstrate responsible supply-chain management.

Integration framework

Integration occurs at **three levels** within procurement policy and process:

Integration Focus		
Policy/Strategic	Incorporate ecolabel requirements into national or sub-national sustainable procurement policy	READ MORE
Operational/ Procedure	Include ecolabel criteria in tender documents, evaluation, and contract clauses	READ MORE
Technical/product	Apply specific ecolabel standards or Type I Ecolabel criteria	READ MORE

Integration framework

Policy/Strategic

From abstract principles to operational standards

A. Institutional Policies

• Integrate ecolabel criteria into **national sustainable procurement policies**, such as GPP (Green Public Procurement) plans.
• Include ecolabel requirements in sectoral frameworks (public works, construction, environmental protection).
• Issue Ministerial Notifications/Guidelines endorsing the use of Type I ecolabels or EPDs.

B. Strategic Objectives

• Set clear goals such as:
  - Reduce embodied carbon in public construction.
  - Increase % of certified green materials purchased.
  - Promote circular and low-carbon construction materials.

C. Stakeholder Mandate & Governance

Assign roles to key agencies:
- Environment authority sets ecolabel criteria.
- Public procurement authority embeds requirements into tender rules.
- Ministry of Construction/Infrastructure mandates certified materials in projects.

Outcome

A strong policy foundation that **requires**, **authorizes**, and **normalizes** the use of ecolabel criteria in public procurement.

Integration framework

Operational/ Procedure

Convert strategic commitments into *standard procurement processes* and day-to-day procedures.

A. Procurement Planning

· Identify priority product categories (e.g., cement, steel, paint, insulation, wood).

· Conduct market readiness assessments to ensure supply availability.

B. Tender Document Integration

Include ecolabel requirements in:

- **Technical specifications**
  - "Products shall carry Type I ecolabel (ISO 14024) or equivalent.'
  - "Minimum recycled content shall be verified by third-party certification.'
- **Evaluation criteria**
  - Award additional points for bidders offering ecolabeled/EPD-certified materials.
- **Qualification requirements**
  - Require manufacturers to provide verified environmental performance documentation.

Integration framework

Operational/ Procedure

C. Contract Conditions

· Require contractors to maintain certification throughout the project.

· Include submission of certificates, EPDs, test results before installation.

D. Verification & Compliance

Develop verification checklists for engineers and procurement officers:

- Document review
- Material delivery inspection
- Supplier certification validation

E. Capacity Building

Train procurement staff, engineers, and quantity surveyors on ecolabel interpretation.

Outcome

A procurement system where ecolabel requirements are **embedded into daily workflow**, ensuring consistency and compliance in all tenders.

Integration framework

Technical/product

Ecolabels provide pre-developed, market-tested technical specifications (e.g., recycled content, energy efficiency, chemical limits). Procurers can **reference "ecolabel or equivalent"** to ensure fairness and legal compliance.

A. Technical Criteria Definition

Translate ecolabel criteria into **measurable, verifiable environmental requirements** on materials and products.

1. Environmental Criteria

- Embodied carbon intensity thresholds
- Energy consumption limits
- Pollution caps (SOx, NOx, PM, heavy metals)
- VOC limits for coatings
- Water consumption limits

2. Resource Efficiency & Circularity

- Minimum recycled content
- Certified raw material input (e.g., FSC wood)
- Use of industrial by-products (e.g., slag, fly ash)

3. Hazardous Substances Restrictions

- No lead, chromium VI, or toxic additives
- Restrictions on hazardous solvents

Integration framework

Technical/product

Third-party certified ecolabels reduce the administrative burden of checking technical documents and prevent greenwashing. Certificates serve as credible proof of compliance.

B. Verification Mechanisms

- Require third-party ecolabel certificates (Thai Green Label, Singapore Green Label, EU Ecolabel).
- Accept Environmental Product Declarations (EPDs) generated to ISO 14025.
- Conduct product testing using accredited laboratories.

C. Product Performance Compatibility

- Ensure environmental improvements do not compromise safety or structural performance.
- Align with building codes and engineering standards.

Outcome

Materials and products used in construction meet verified environmental performance standards, supporting low-carbon, circular, and sustainable project outcomes.

Where to apply Ecolabel criteria

Design stage

Integrate or specify the use of materials that meet ecolabel or equivalent criteria

- Integrate environmental labeling criteria or equivalent criteria.
- Identify Sustainable Product

Tendering & Evaluation

Include ecolabel compliance as technical specifications or award criteria

- Bidding
- Measuring Environmental Benefits

Contract implementation

Require suppliers to maintain ecolabel certification or provide equivalent proof throughout the contract

Integrate environmental labeling criteria or equivalent criteria.

This is the most important step in implementing environmental labeling:

1. Specification: Specify in the TOR that the product must have an environmental label, such as "Must be a product with a Green Label certification or equivalent."

2. Used as a scoring criterion (Price Performance): In cases where quality is considered in conjunction with price, extra points can be awarded **to bidders whose products have various types of environmental labels.**

Integrate environmental labeling criteria or equivalent criteria

EXAMPLE Integrate Ecolabel criteria to TOR

Project: Office Building Construction Procurement
Objective: To promote the use of low-carbon construction materials and reduce greenhouse gas emissions from the construction process.

1. Scope of Work
   1.1 The contractor must supply cement and concrete that meet low-carbon criteria.
   1.2 Materials used must have a Carbon Footprint of Product (CFP) value according to Green Label, EPD Label, or Carbon Footprint Label standards.
   1.3 Bidders must attach certification documents for materials as per item 1.2.
   1.4 In the case of ready-mixed concrete, at least 10% of the total volume must be pozzolanic cement or SCM (Supplementary Cementitious Materials) (or as appropriate to the structural characteristics).
   1.5 Material delivery and construction must have a plan to reduce emissions (e.g., clean fuel transport vehicles, energy-efficient batching plant systems).

2. Eligibility Criteria
   2.1 Must be a registered service provider, manufacturer, or distributor in Thailand.
   2.2 Must have a Thai Industrial Standard (TIS) certificate for cement and concrete.
   2.3 Must have an environmental label certificate. or equivalent documents from a government-recognized agency.
   2.4 Evidence of the use of renewable energy in the production process.

3. Evaluation Method: A "Quality-Cost Based Selection" (QCBS) system will be used.
   Technical score: 70 points
   Price score: 30 points
   Those who pass the technical evaluation must obtain at least 70% of the total technical score.

Integrate environmental labeling criteria or equivalent criteria

EXAMPLE Technical Evaluation Matrix

Scope of evaluation	Specification	Scores	Minimum passing score	Notes/References
1. The use of Low-carbon materials	CFP certificate for cement ≤ 800 $kgCO_2/ton$	25	15	Certification document from TGO or TEI or equivalent.
2. The use of alternative materials. (SCM / recycled content)	Use ≥ 20% pozzolanic materials or Use ≥ 10% recycled materials in concrete.	15	8	Ingredient details / Laboratory test report.
3. Plans to reduce CO_2 and pollution emissions during construction.	There are plans to use clean energy / clean fuel transport vehicles / batching efficiency systems.	10	5	Action plan / Illustrations / Technical report
4. Innovative or additional carbon reduction technologies.	New techniques are proposed, such as using additives to reduce cement content and precast systems to reduce waste.	10	-	Technical details
5. Quality standards and certification.	TIS or ISO 9001 or ISO 14001 or ISO 50001	5	3	A copy of a certificate from a reputable agency.
Technical scores.		65	45 (70%)	
Price scores	The lowest bid is calculated using the price scoring formula (30 points).	30	-	The formula is 30 × (lowest price / bidder's price).
Total		100	-	The highest total score wins.

Additional key points of the process

1. The procurement plan must be published on the e-GP system and publicly displayed at the designated posting area of the agency.

2. The draft scope of work or specifications of the goods or services to be purchased or hired may be published for public consultation along with the draft announcement and draft documents for electronic bidding from contractors, subject to the following guidelines:

(1) For purchases or hires exceeding 500,000 baht but not exceeding 5,000,000 baht, it is at the discretion of the local administrator whether or not to publish the draft for public consultation from contractors.

(2) For purchases or hires exceeding 5,000,000 baht, the agency must publish the draft announcement and draft documents for electronic bidding for public consultation from contractors.

Policy Notes:
Environmental labels should be used as a verification tool, not as an unjustified barrier to competition. Equivalent labels or verified environmental information demonstrating compliance with established environmental criteria will be accepted under the Government Procurement and Materials Management Act B.E. 2560 (2017) and the Ministerial Regulation on Procurement Materials and Methods to be Promoted by the Government (Main Version B.E. 2563 and amendments).

Below is a **clear, policy-ready table** mapping **ecolabels to construction works procurement stages**, suitable for direct insertion into the **SPP for Green Construction** manual.

Procurement Stage	Purpose in Construction Works	Applicable Ecolabels / Tools	How It Is Used in Practice
1. Procurement Planning	Identify priority materials and works with high environmental impact (e.g. cement, steel, asphalt, buildings)	Green Label, Carbon Footprint Reduction Label, Carbon Footprint Label, EPD	Used to screen eligible green materials and define the scope of green construction requirements in project planning documents
2. Pre-qualification / Selection	Ensure contractors and suppliers have capability to deliver environmentally compliant works	ISO 14001 (EMS), Carbon Footprint Label (organization-level), EPD experience	Contractors demonstrate experience using ecolabelled materials and managing environmental performance
3. Technical Specifications	Define minimum environmental requirements for construction materials and methods	Green Label, Carbon Footprint Reduction Label, EPD	Specifications require use of certified materials (e.g. Green Label cement, EPD-verified steel) or equivalent
4. Tender Documentation (TOR)	Translate sustainability objectives into clear and verifiable tender requirements	Green Label, Carbon Footprint Reduction Label, Carbon Footprint Label, EPD	TOR references recognised ecolabels as acceptable means of proof, in compliance with procurement law
5. Bid Evaluation (Award Criteria)	Differentiate bids based on environmental performance, not price alone	EPD, Carbon Footprint Reduction Label, Carbon Footprint Label, LCA, LCC	Bids score higher for lower life-cycle CO_2, energy use, or environmental impact

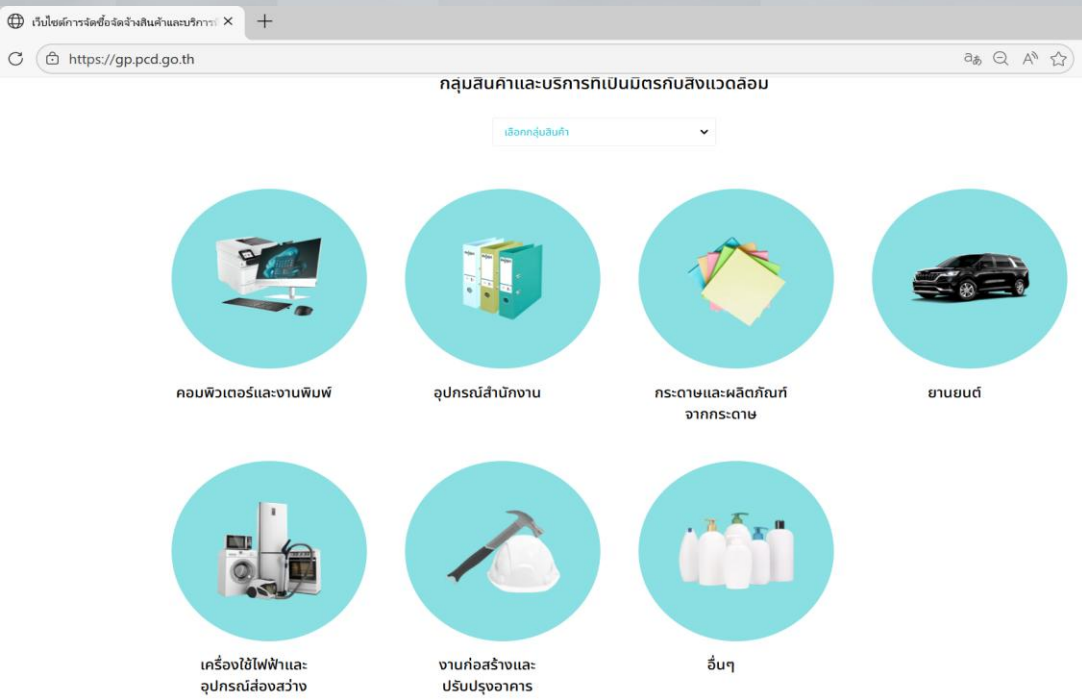
Below is a **clear, policy-ready table** mapping **ecolabels to construction works procurement stages**, suitable for direct insertion into the **SPP for Green Construction** manual.

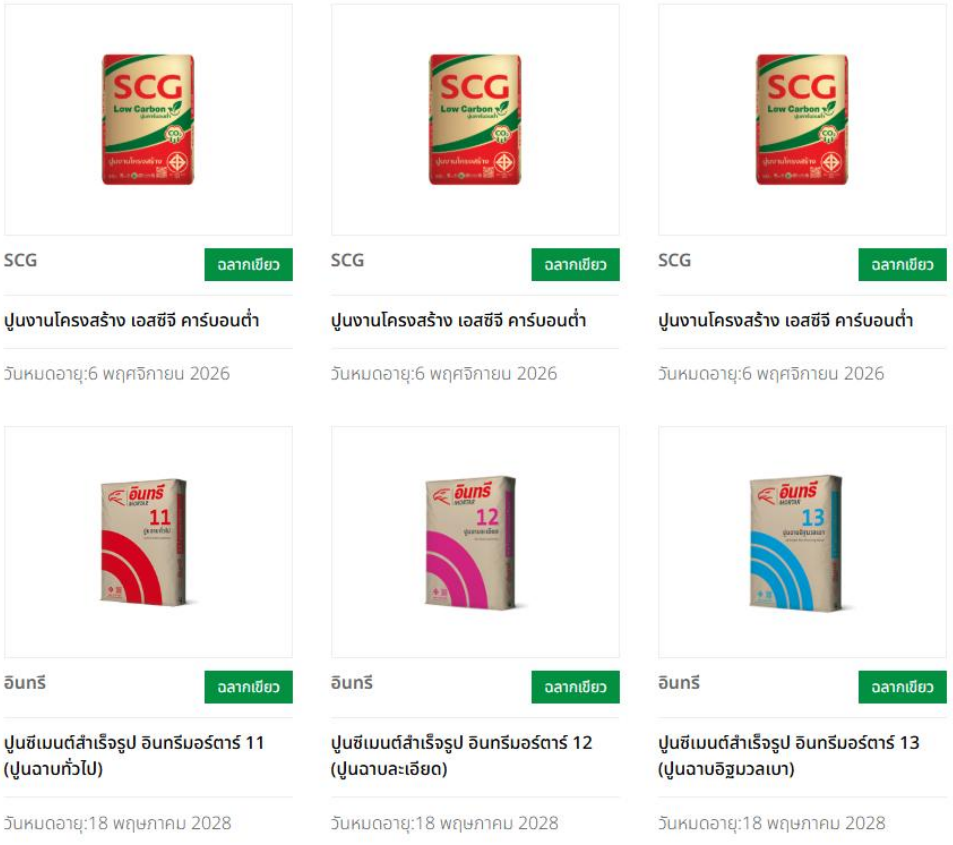
Procurement Stage	Purpose in Construction Works	Applicable Ecolabels / Tools	How It Is Used in Practice
6. Contract Award (MEAT / Best Value)	Select the most economically and environmentally advantageous tender	LCA, LCC, Carbon Footprint Label, EPD	Environmental performance is assessed alongside cost and technical quality
7. Contract Performance Clauses	Ensure environmental commitments are delivered during construction	Green Label, Carbon Footprint Reduction Label, Carbon Footprint Label, EPD	Contracts require approved materials and reporting of quantities, emissions, and waste
8. Construction & Implementation	Monitor actual environmental performance on site	Carbon Footprint data, material EPDs	Contractors submit material delivery records and environmental reports
9. Monitoring & Reporting	Track environmental outcomes of construction works	Carbon Footprint data, LCA, LCC	Data feeds into agency and national GPP/SPP reporting systems
10. Post-Completion Review	Evaluate environmental performance and inform future procurement	LCA, LCC, EPD	Lessons learned used to update criteria, product lists, and procurement targets

Identify Sustainable Product

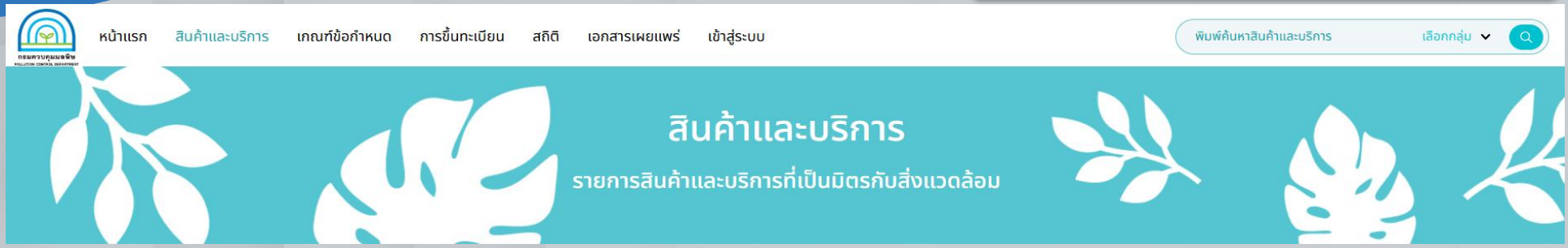
Recognized ecolabels provide searchable product databases and visible marks, helping procurers quickly identify compliant products in the market.

Website for purchasing environmentally friendly goods and services.





Identify Sustainable Product



Paints (284)

Cement and Cement Products (66)

Thermal Insulation (32)

Wall Construction Materials (15)

Faucets and Water-Saving Devices (1475)

Steel Roofing (64)

Pressure Sheets for Building, Decoration, and Furniture Industries (1)

Cement Boards (91)

Gypsum Boards (10)

Adhesives (6)

Thermal Insulation: Rubber Insulation (2)

Polyethylene Plastic Water Pipes (76)

Rigid PVC Pipes for Drinking Water (40)

Soundproofing Walls (1)

Ceramic Floor/Wall Tiles (48)

Wood-Based Construction Materials (2)

Other Steel Products (8)

Welding Wire (7)

Other Types of Cement (15)

Steel Pipes (114)

Asbestos Cement Pipes (3)

Refractory Bricks (1)

Reference on March 2026

Measuring Environmental and Economic Benefits

Environmental labeling criteria are based on life cycle and measurable impacts. Governments can use the proportion of labeled products purchased as a proxy for carbon reduction, resource efficiency, and support for SDGs.

Case studies of using green building materials in construction.

Examples of ecofriendly materials.	Advantages	References
Type of work: Highways, Bridges		
- Recycled Asphalt Pavement (RAP) - Fly Ash used in concrete - Rubber Asphalt	- Reduce the amount of new material used. - Reduce CO_2 emissions. - Increase pavement surface flexibility and reduce cracking.	Department of Highways. (2020). Construction Material and Roadwork Standards Manual. Bangkok: Ministry of Transport.
Type of work: Rural roads, small bridges		
- Local materials (fill soil, local stone) - Bamboo/recycled wood for temporary bridges	- Reduces transportation costs. - Uses renewable materials. - Suitable for rural areas; safe and economical.	Department of Rural Roads. (2021). Guidelines for the Construction of Rural Roads and Temporary Bridges. Nakhon Ratchasima: DRR.
Types of work: Dams, weirs, canals		
- Fly Ash / Slag in concrete - Geosynthetics from recycled materials	- Reduce the amount of cement needed. - Increase resistance to water erosion. - Reduce environmental impact.	Royal Irrigation Department. (2019). Guidelines for the Use of Recycled Materials in Irrigation Works. Bangkok: RID.
Type of work: Buildings, urban structures		
- Low-Energy Concrete - Recycled Lightweight Concrete - Recycled Bamboo/Wood	- Reduces the use of new materials. - Reduces structural weight. - Suitable for green buildings.	Department of Public Works and Town Planning. (2022). Green Building Construction Materials Standards Manual. Bangkok: DPT.

Measuring Environmental and Economic Benefits

EXAMPLE Example of defining environmental performance indicators.

Impact category	Indicators	Calculation method
Climate	Reduce tCO_2 emission	(EF BAU – EF Eco) × amount
Energy	Saving of energy in kWh	%save × Total energy consumption
Resource efficiency	% of Recycled materials	Recycling quantity ÷ Total quantity
Waste	Reduce ton of waste	Before and after comparison.
Water	m^3 of Water saving	Industry average × Production volume

Measuring Environmental and Economic Benefits

EXAMPLE Reducing greenhouse gas emissions from the use of low-carbon cement.

Project Assumptions:

- The government building project will use 5,000 cubic meters of concrete.
- The cement usage will be 300 kg/cubic meter.
- Normal cement releases 0.86 tCO_2e/ton.
- Labeled cement (Low-carbon cement) releases less than 0.80 tCO_2e/ton.

Calculation steps:

Amount of cement needed:	5,000 cubic meters × 0.3 tons	= 1,500 tons
CO_2 emissions in BAU scenario.	1,500 × 0.86	= 1,290 tCO_2e
CO_2 emissions from certified ecolabel materials	1,500 × 0.75	= 1,125 tCO_2e
CO_2 emissions result	1,290 – 1,125	= 165 tCO_2e

Measuring Environmental and Economic Benefits

EXAMPLE Reducing energy consumption by using high-efficiency building materials.

Case: Thermal insulation with a certified environmental label.

Project Assumptions:

- Building size: 10,000 sq.m.
- Standard insulation reduces energy load by 10%.
- Labeled insulation reduces load by 18%.
- Annual building electricity cost: 3,000,000 kWh.

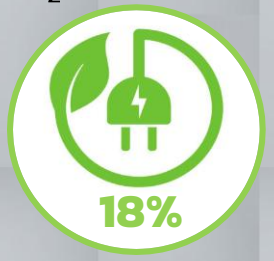
👉 Equivalent to planting approximately

10,800 trees/year

Calculation steps:

Energy saving in BAU scenario.	Energy save 10% → save **300,000** kWh
Energy saving from certified ecolabel materials	**Energy save** 18% → save **540,000 kWh**
Difference in energy savings	= 240,000 kWh/year
Emission factor	= 0.45 kgCO_2/kWh
CO_2 emissions result	240,000 × 0.45 = 108 tCO_2e/year

👉 CO_2 emissions = 108 tCO_2e per year, or = 3,240 tCO_2e. over the building's 30-year lifespan



Measuring Environmental and Economic Benefits

EXAMPLE Reducing waste and promoting the circular economy.

Case: Recycled Steel with a certified environmental label.

- Ordinary steel releases CO_2 = 1.9 tCO_2e/ton
- Certified Steel releases CO_2 = 0.8 tCO_2e/ton
- Steel used 800 ton = 1.1 tCO_2e × 800 = **880 tCO_2e reduction**

In addition:

- Reduce the use of new iron ore.
- Reduce mining waste.
- Reduce water and energy consumption in the production process.

SUMMARY

Ecolabels in SPP for Construction Works

Summary: Why Ecolabels Are the “Easy Button’

Procurement Stage	Without Ecolabels	With Ecolabels
Policy definition	Conceptual, vague	Operationalized, science-based
Criteria drafting	Technically complex	Pre-developed criteria
Verification	High administrative burden	Third-party certified
Market identification	Time-consuming research	Recognizable certified products
Impact reporting	Complex calculations	Credible proxy metrics

Strategic Policy Message
Ecolabels do not replace procurement expertise — but they dramatically reduce technical, legal, and administrative burdens.

SUMMARY

Ecolabels in SPP for Construction Works

Reliably third-party certified environmental labeling enables government agencies to translate environmental and climate policy targets into clear, measurable, and verifiable technical specifications, reducing practical complexities, legal risks, and exaggeration issues while maintaining transparency and fair competition. Environmental labeling in construction procurement directly supports:

- **Sustainable Development Goal (SDG 12)** on sustainable consumption and production through the life cycle concept of materials;

- **Sustainable Development Goal** (SDG 13) on climate change adaptation by reducing embodied carbon in construction materials;

- **Thailand's Nationally Determined Contribution** (NDC) through the reduction of greenhouse gas emissions in the building and construction materials sector;

- **The country's Long-Term Low-Emission Development Strategy** (LT-LEDS) and its carbon neutrality/Net Zero target by 2050–2065 through market restructuring towards low-carbon construction materials.

Beyond compliance, environmental labeling serves as a “market signal’ encouraging manufacturers to innovate, reduce carbon in production processes, and promote a circular economy, leading to upgrades in the entire construction industry value chain and increased long-term cost-effectiveness throughout the project's lifecycle.

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SUSTAINABLE PUBLIC PROCUREMENT AND LABELING

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