

UN01-19	Target Group: G Registered CDM Projects by scope Distribution of registered project activities by scope <table border="1"> <thead> <tr> <th>Activity</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Other</td> <td>34.77%</td> </tr> <tr> <td>Transportation</td> <td>2.25%</td> </tr> <tr> <td>Manufacturing</td> <td>1.74%</td> </tr> <tr> <td>Energy</td> <td>1.17%</td> </tr> <tr> <td>Transportation</td> <td>1.17%</td> </tr> <tr> <td>Manufacturing</td> <td>1.17%</td> </tr> <tr> <td>Energy</td> <td>1.17%</td> </tr> <tr> <td>Transportation</td> <td>1.17%</td> </tr> <tr> <td>Manufacturing</td> <td>1.17%</td> </tr> <tr> <td>Energy</td> <td>1.17%</td> </tr> <tr> <td>Transportation</td> <td>1.17%</td> </tr> <tr> <td>Manufacturing</td> <td>1.17%</td> </tr> <tr> <td>Energy</td> <td>1.17%</td> </tr> <tr> <td>Transportation</td> <td>1.17%</td> </tr> <tr> <td>Manufacturing</td> <td>1.17%</td> </tr> </tbody> </table> Source: http://cdm.unfccc.int/Statistics/Registration/RegisteredProjByScopePieChart.html	Activity	Percentage	Other	34.77%	Transportation	2.25%	Manufacturing	1.74%	Energy	1.17%	Transportation	1.17%	Manufacturing	1.17%	Energy	1.17%	Transportation	1.17%	Manufacturing	1.17%	Energy	1.17%	Transportation	1.17%	Manufacturing	1.17%	Energy	1.17%	Transportation	1.17%	Manufacturing	1.17%	Key Points - More than (2,000) projects have been registered as of (July 2010) Reference and Additional Information - CDM statistics http://cdm.unfccc.int/Statistics/index.html - List of registered CDM projects http://cdm.unfccc.int/Projects/registered.html
Activity	Percentage																																	
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UN01-20	Target Group: G
Thailand's Current Status ❖ Thailand has ratified UNFCCC on Dec 28, 1994 and Kyoto Protocol on Aug 28, 2002. ❖ Thailand Greenhouse Gas Management Organization (TGO) is the CDM Designated National Authority in Thailand. ❖ Thailand can participate in GHG mitigation by conducting CDM projects. ❖ Currently, there are 111 approved CDM projects in Thailand and accounts for 6,947,295 tCO₂e/year reduction. 20	
Key Points	Reference and Additional Information

UN01-21	Target Group: G	CDM Projects approved by Thailand's DNA CDM Thailand's DNA CDM approved 111 projects (July 2010) Emission Reduction → 6.95 million tons CO₂ e/ year http://www.tgo.or.th/index.php?option=com_content&task=category&sectionid=6&id=30&Itemid=40	Key Points Reference and Additional Information
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UN01-22	Target Group: G	CDM Projects Registered by CDM EB Thailand's 36 Registered CDM Projects (July 2010) Emission Reduction → 2.13 million tons CO₂ e/ year Source: http://www.tgo.or.th/index.php?option=com_content&task=category&sectionid=6&id=30&Itemid=40	Key Points Reference and Additional Information
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UN01-23	Target Group: G	Accumulated Number of Registered CDM Projects in ASEAN Countries <table><tr><th>Country</th><th>2009</th><th>2010</th></tr><tr><td>Indonesia</td><td>33</td><td>48</td></tr><tr><td>Lao PDR</td><td>1</td><td>1</td></tr><tr><td>Malaysia</td><td>1</td><td>1</td></tr><tr><td>Singapore</td><td>1</td><td>81</td></tr><tr><td>Thailand</td><td>29</td><td>36</td></tr><tr><td>Viet Nam</td><td>11</td><td>26</td></tr></table> TGO http://cdm.unfccc.int/Statistics/Registration/NumOfRegisteredProjByHostPartiesPieChart.html 23	Country	2009	2010	Indonesia	33	48	Lao PDR	1	1	Malaysia	1	1	Singapore	1	81	Thailand	29	36	Viet Nam	11	26	Reference and Additional Information
Country	2009	2010																						
Indonesia	33	48																						
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Malaysia	1	1																						
Singapore	1	81																						
Thailand	29	36																						
Viet Nam	11	26																						
Key Points																								

UN01-24	Target Group: G	Thank You! Thailand Greenhouse Gas Organization (Public Organization) The Government Complex, Building B, 9th Floor 120 Chaengwattana Rd., Laksi, Bangkok 10210, Thailand Tel: 0-2141-9816 Fax: 0-2143-8401 www.tgo.or.th 24	
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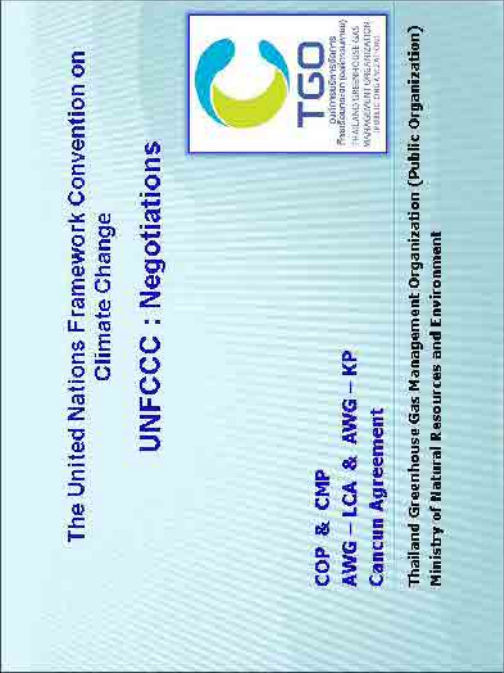
UNFCCC : Negotiations

Target Groups

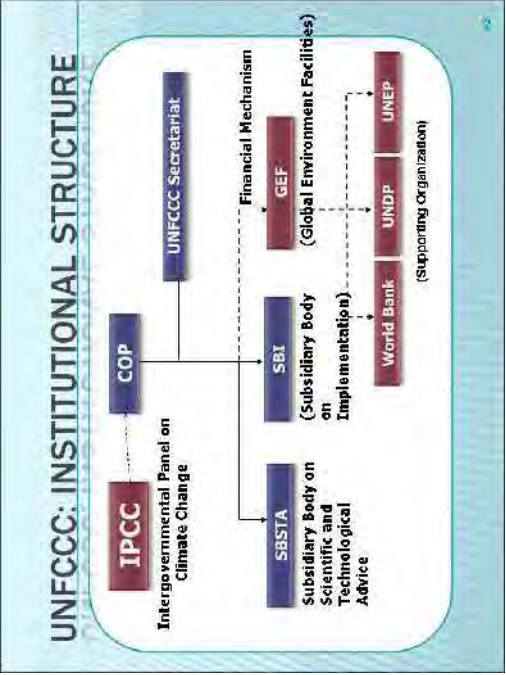
Code	Target group
G	General audience and potential project proponent

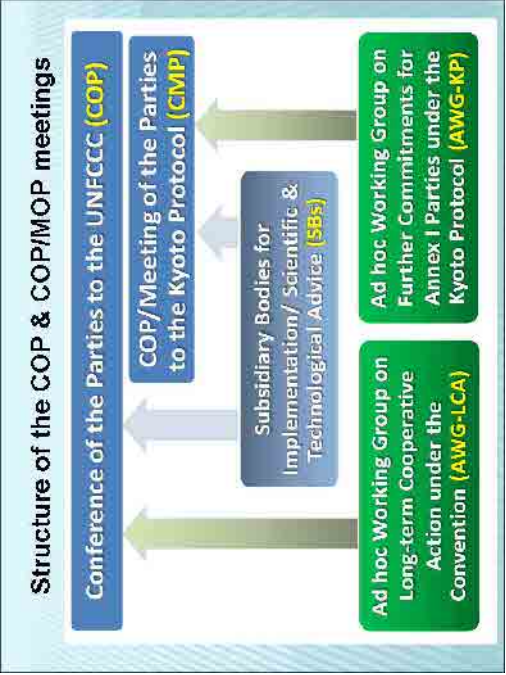
Update History

Version	Date	Update Contents
01	08/2011	Initial adoption

UN 02-01	Target Group: G
	
Key Points	Reference and Additional Information

UN 02-02	Target Group: G
	
Key Points	Reference and Additional Information

UN 02-03	Target Group: G
 The diagram illustrates the institutional structure of the United Nations Framework Convention on Climate Change (UNFCCC). At the top is the UNFCCC Secretariat. Below it is the COP (Conference of the Parties). To the left of the COP is the IPCC (Intergovernmental Panel on Climate Change). Below the COP are three boxes: SBSTA (Subsidiary Body on Scientific and Technological Advice), SBI (Subsidiary Body on Implementation), and GEF (Global Environment Facilities). Arrows indicate the flow of information and support. The Financial Mechanism is shown as a dashed line connecting the GEF to the SBI. The World Bank, UNDP, and UNEP are shown as Supporting Organizations at the bottom, with arrows pointing to the GEF.	
Key Points	Reference and Additional Information

UN 02-04	Target Group: G
 The diagram shows the structure of the Conference of the Parties (COP) and its meetings. At the top is the Conference of the Parties to the UNFCCC (COP). Below it is the COP/Meeting of the Parties to the Kyoto Protocol (CMP). To the left of the COP is the Ad hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA). To the right of the COP is the Ad hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP). Arrows indicate the flow of information and support. The Subsidiary Bodies for Implementation/ Scientific & Technological Advice (SBIs) are shown as a central box with arrows pointing to the COP and the AWG-LCA.	
Key Points	Reference and Additional Information

UN 02-05	Target Group: G	
	Key issues under COP and CMP Negotiations AWG - LCA - Adaptation - Mitigation - Finance - Technology - Capacity Building - For Developed Countries (NAMA) - REDD plus - Cooperative Sectoral Approach - Various Approaches including Market Mechanism - Economic & Social Consequences AWG - KP - Aggregate & Individual Numbers (Scale of Emission Reduction) - Mechanism / CDM - LULUCF - Potential Consequences	
	Key Points	

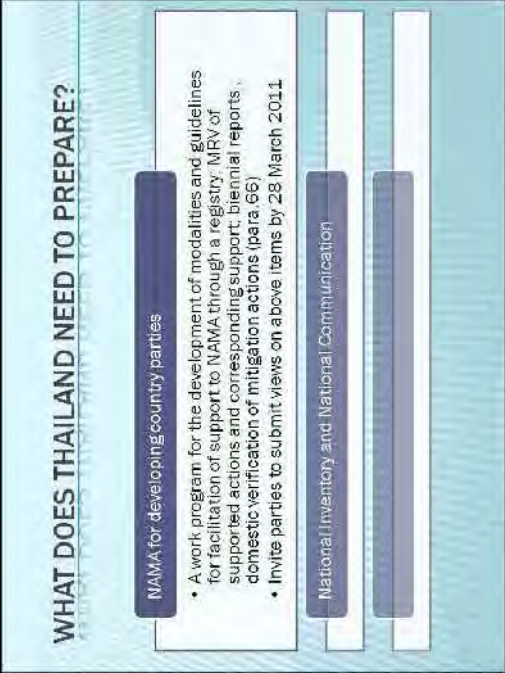
UN 02-06	Target Group: G																	
BASIC OF INFORMATION: MEANING OF 450PPM ? Top-down Approach: Box 13.7 in IPCC-AR4 (WG III) <table border="1"> <thead> <tr> <th>Scenario</th><th>Region</th><th>2020</th><th>2050</th></tr> </thead> <tbody> <tr> <td>450 ppm CO₂-eq</td><td>Annex I Non-AI</td><td>-25% to -40% below 1990 Substantial Deviation from Baseline in some</td><td>-80% to -95% below 1990 Substantial Deviation from Baseline in all</td></tr> <tr> <td>550 ppm CO₂-eq</td><td>Annex I Non-AI</td><td>-10% to -30% below 1990 Deviation from Baseline in some</td><td>-40% to -60% below 1990 Deviation from Baseline in most</td></tr> <tr> <td>650 ppm CO₂-eq</td><td>Annex I Non-AI</td><td>0% to -25% below 1990 Baseline</td><td>-30% to -60% below 1990 Deviation from Baseline in some</td></tr> </tbody> </table> Source: Adjusted from IPCC Working Group III, 2007 (Box 13.7, p.778)	Scenario	Region	2020	2050	450 ppm CO ₂ -eq	Annex I Non-AI	-25% to -40% below 1990 Substantial Deviation from Baseline in some	-80% to -95% below 1990 Substantial Deviation from Baseline in all	550 ppm CO ₂ -eq	Annex I Non-AI	-10% to -30% below 1990 Deviation from Baseline in some	-40% to -60% below 1990 Deviation from Baseline in most	650 ppm CO ₂ -eq	Annex I Non-AI	0% to -25% below 1990 Baseline	-30% to -60% below 1990 Deviation from Baseline in some	Key Points	Reference and Additional Information
Scenario	Region	2020	2050															
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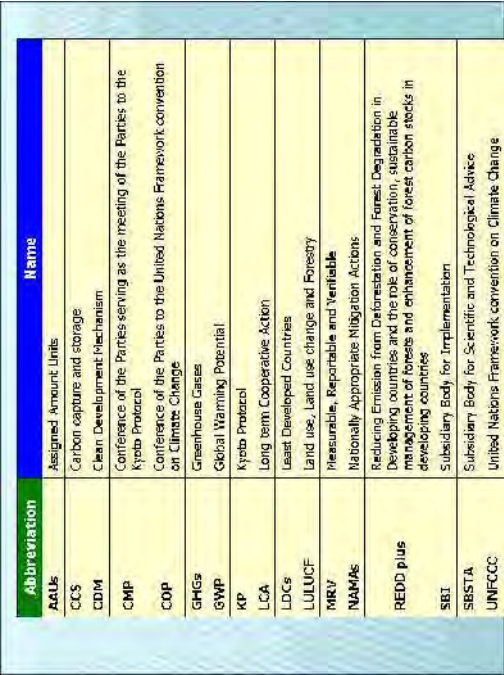
UN02-09	Target Group: G
Summary of the UNFCCC and Kyoto Protocol negotiation outcomes from COP16, AWG-LCA 13, CMP6 and AWG-KP 15 Decision -/CP.16 The "Cancun Agreements" as major outcomes COP 16 AWG-LCA 13 Main elements under the Bali Action Plan (Decision 1/CP.13) Shared Vision for Long-term Cooperative Action Mitigation - Financing - Technology - Capacity Building Adaptation CMP 6 AWG-KP15 - Clean Development Mechanism - Carbon Capture Storage	
Key Points	Reference and Additional Information

UN02-10	Target Group: G
CANCUN AGREEMENT: AWG - LCA ✧ Agree that developed countries will take to lead role in greenhouse gas emission reduction. ✧ Establish the Green Climate Fund as an operating entity of the financial mechanism of UNFCCC	
Key Points	Reference and Additional Information

UN02-11	Target Group: G	LCA: SHARED VISION FOR LONG-TERM COOPERATIVE ACTION Key messages - Deep cuts in "Global GHG emissions" - To hold the increase in "Global average temperature" below 2°C - Scaled-up overall mitigation efforts Agrees "Identifying a Global Goal" for reducing emission by 2050 - Parties to cooperate in achieving the peaking of GHG emission ASAP - Both "global" and "national" peaking GHG emission - Longer timeframe for developing countries "Identify a Timeframe for Global Peaking" Need to engage a broad range of stakeholders : Global, regional, national & local levels (governments/ private business/ civil society) Realizes a paradigm shift towards a Low-Carbon Society	Key Points . Reference and Additional Information
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UN02-12	Target Group: G	LCA: Nationally Appropriate Mitigation Commitments or Actions by Developed Country Parties Targets & Comparability - Takes note of communicated "Quantified economy-wide emission reduction targets" - Urges Parties to increase the aggregated GHG reduction level recommended level - Secretariat to organize workshops to clarify : - Assumptions & Conditions related to targets - Options & Ways to increase their ambition - Secretariat to prepare a technical paper on : - Parties' commitment to understand Assumptions & Conditions related to targets - Comparison of emission reduction efforts - To establish, in the SBI, a process for international assessment of emissions and removals related to targets – to promote comparability and building confidence - To establish National Arrangements for the estimation of emissions of all GHG Reporting - Enhance reporting in the National Communication : - Annual Report - National GHG Inventory - Biennial Reports - Progress to achieve targets - Emission reduction achieved - Provision of supports to developing countries - Enhance guidelines on : - Reporting information in the National Communication - Review information in the National Communication Strategy/Plan - Low-Carbon Development Strategy/ Plan Work Programs on : - Revision of guidelines for reporting of NC - Revision of guidelines for the review of NC - Guidelines for national inventory arrangements - Modalities and procedure for international assessment	Key Points . Reference and Additional Information
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UN02-15	Target Group: G
	
Key Points	Reference and Additional Information
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UN02-16	Target Group: G
	
Key Points	Reference and Additional Information
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UN02-17	Target Group: G
Contact us Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) 120 Building B, 9th Floor, Government Office Complex, Chaengwattana Road, Laksi, Bangkok 10210 THAILAND Tel. +662 141 9790 Fax. +662 143 8400 -4 E-mail: weerada@tgo.or.th URL: www.tgo.or.th	Reference and Additional Information

Target Groups

Code	Target group
G	General audience

UNFCCC Structure and Negotiations (REDD)

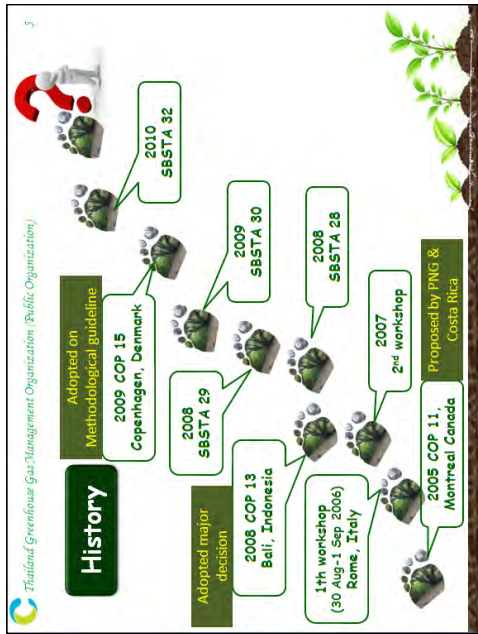
Update History

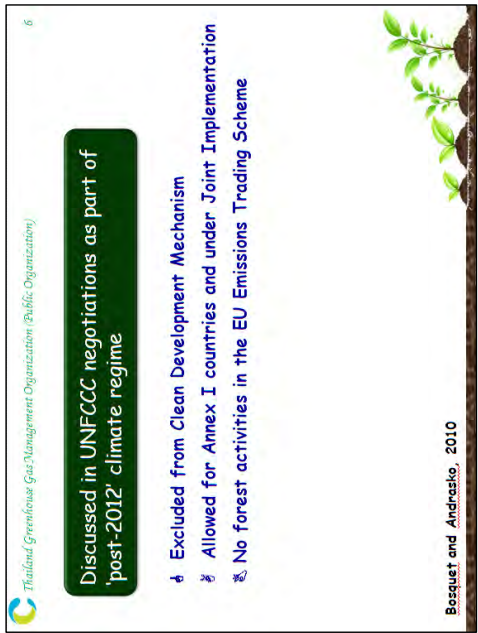
Version	Date	Update Contents
01	20/01/2011	Initial adoption

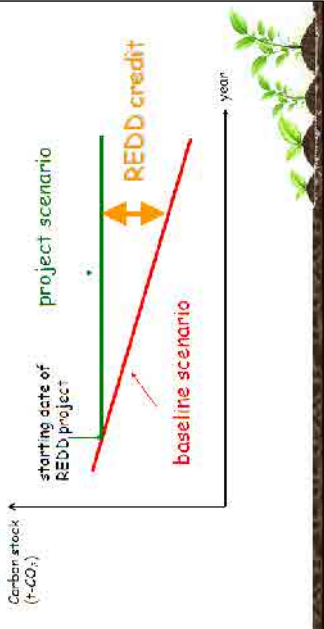
UN03-01	Target Group: G		Key Points	Reference and Additional Information
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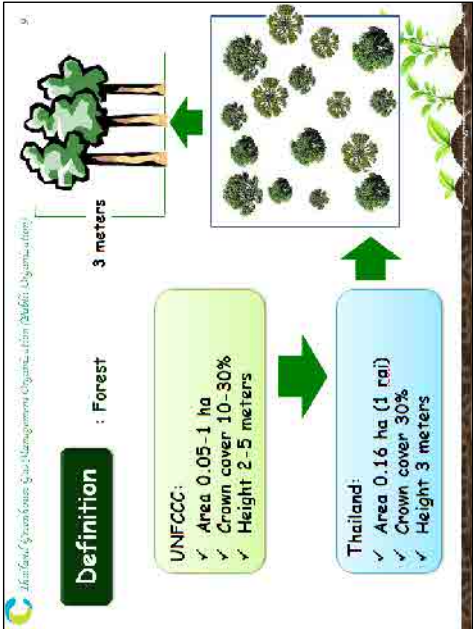
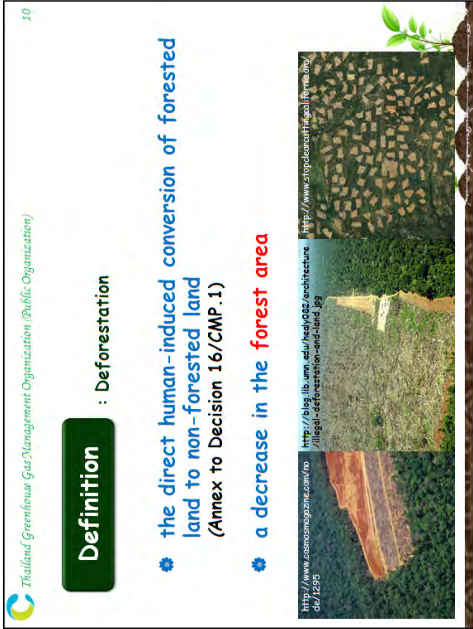
UN03-02	Target Group: G		Key Points	Reference and Additional Information
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UN03-03	Target Group: G	Role of Forests in Climate Change Mitigation Forest play an important role in global C budget, acting either as sinks or source of C. - Total C content of forest ecosystem estimated about 638 Gt C (FAO, 2005) - Tropical forests store about 50% more C per unit area.	Key Points - In figure, There are the balances of carbon in all natural situations. - Only in the usage of fossil fuel that emitted the carbon in the atmosphere. Reference and Additional Information
UN03-04	Target Group: G	The emission from deforestation activities - It is estimated that deforestation contributed approximately 5.8 GtCO₂/yr to global greenhouse gas emission in the 1990s (IPCC WGIII, AR4) - Reduced deforestation and degradation is the forest mitigation option with largest and most immediate C stock impact (IPCC WGIII, AR4)	Reference and Additional Information

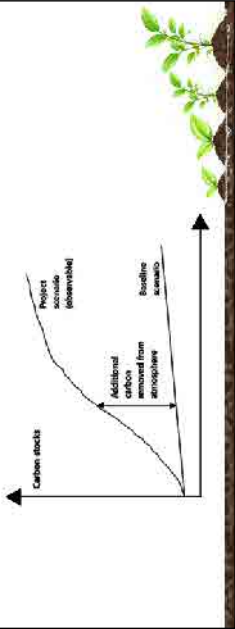
UN03-05	Target Group: G	 History 2005 COP 11, Montreal, Canada 2006 COP 13, Bali, Indonesia 2007 COP 15, Copenhagen, Denmark 2008 SBSTA 29 2009 SBSTA 30 2010 SBSTA 32 Adopted on Methodological guideline Adopted major decision 1st workshop (30 Aug-1 Sep 2006) Rome, Italy 2nd workshop Proposed by PNG & Costa Rica
Key Points Cop 11: - proposed by Papua New Guinea and Costa Rica - provided a mandate for further work by SBSTA (Subsidiary Body for Scientific and Technical Methodologies issues) 1st workshop : - scientific, socio-economic, technical and methodological issues - policy approaches and positive incentives 2nd workshop : - ongoing and potential policy approaches - positive intensives - technical and methodological requirement - assessment of results - provision of other conventions (CBD, UNCCD, Ramsar) - work of multilateral organizations (UNFF, ITTO, WTO) COP 13: - adopted a major decision on REDD * Further strengthening and supporting ongoing efforts * Supporting capacity building, technical assistance and transfer of technology * Explore a range of actions, identify options and undertake demonstration activities to address drivers of deforestation * Mobilize resources		SBSTA 28: - Workshop on Methodological issue (Jun 25-27 2008, Tokyo, Japan) main issues are about forest cover, reference emission level, technology transfer and capacity building SBSTA 29: - Recommended methodological guidance (IPCC Guideline and Good Practice Guidance) SBSTA 30: - Conducted the expert meeting on methodological issue relating to reference emission levels and reference level (23-24 March 2009 Bonn, Germany) and also COP 15: - adopted on Methodological guidance for activities relating to reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries SBSTA 32: aims of the meeting are increasing the number of experts trained in the use of the IPCC guidance and guidelines and enhancing sharing of information, experiences and lessons learned on the use of the IPCC guidance and guidelines on the UNFCCC website.

UN03-06	Target Group: G	 Discussed in UNFCCC negotiations as part of 'post-2012' climate regime - Excluded from Clean Development Mechanism - Allowed for Annex I countries and under Joint Implementation - No forest activities in the EU Emissions Trading Scheme Bosquet and Andreasko, 2010
Key Points - The discussion before COP 15		Reference and Additional Information

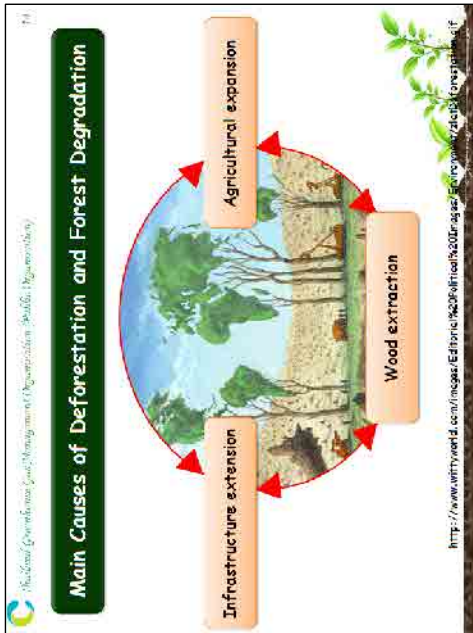
UN03-07	Target Group: G	Thailand Greenhouse Gas Management Organization (Public Organization) What's REDD RED = Reducing Emissions from Deforestation in Developing Countries REDD = Reducing Emissions from Deforestation and Forest Degradation in Developing Countries REDD+ = Reducing Emissions from Deforestation and Forest Degradation in Developing Countries plus Enhancement of Carbon Stocks REDD++ = Reducing Emissions from Deforestation and Forest Degradation in Developing Countries plus Enhancement of Carbon Stocks plus Ecosystem Service 	UN03-08	Target Group: G	Thailand Greenhouse Gas Management Organization (Public Organization) What's REDD : Basic concept of crediting to REDD 	Key Points - The red line is the deforestation rate of the project site before implementing project. - The green line is the deforestation rate after implementing project. - The gap between the red line and the green line is the credit from REDD project Reference and Additional Information	Key Points Reference and Additional Information
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UN03-09	Target Group: G	 Thailand Greenhouse Gas Management Organization (Public Organization) Definition : Forest UNFCCC: ✓ Area 0.05-1 ha ✓ Crown cover 10-30% ✓ Height 2-5 meters Thailand: ✓ Area 0.16 ha (1 rai) ✓ Crown cover 30% ✓ Height 3 meters 3 meters	Key Points Reference and Additional Information
UN03-10	Target Group: G	 Thailand Greenhouse Gas Management Organization (Public Organization) Definition : Deforestation - the direct human-induced conversion of forested land to non-forested land (Annex to Decision 16/CMP.1) - a decrease in the forest area http://www.somnongzoo.com/no-03-10-25 http://blog.lb.wm.edu/haaj02z/architecture/haaj02z-architectural-education-25 http://www.stopdeforestation.org	Key Points Reference and Additional Information

UN03-11	Target Group: G	 Definition : Forest Degradation - a direct human-induced, long-term loss (persisting for X years or more) or at least Y% of forest carbon stocks since time T and not qualifying as deforestation - Not a reduction of the forest area but rather a quality decrease  Forest degradation is a long-term loss of forest carbon stocks, which may be caused by a direct human-induced loss of forest area or by a direct human-induced loss of forest carbon stocks, which may be caused by a direct human-induced loss of forest area or by a direct human-induced loss of forest carbon stocks. <td data-kind="ghost"></td> <td> Key Points Reference and Additional Information </td>		Key Points Reference and Additional Information
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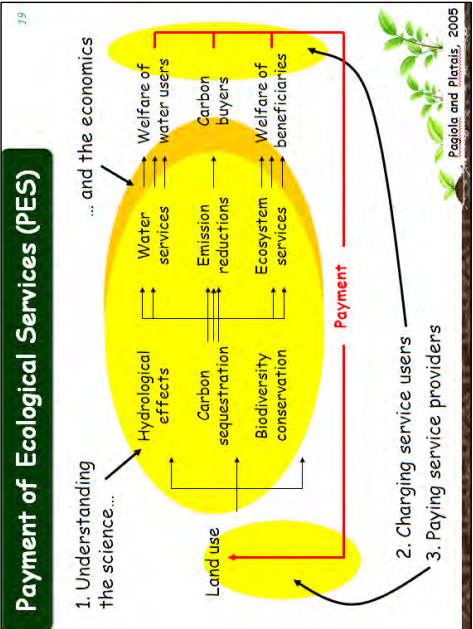
UN03-12	Target Group: G	 What's Baseline? : Baseline - The sum of the changes in carbon stocks in the carbon pools within the project boundary that would have occurred in the absence of the proposed project activity (CDM)  <td data-kind="ghost"></td> <td> Key Points - The term of baseline is usually use for CDM project. Reference and Additional Information </td>		Key Points The term of baseline is usually use for CDM project. Reference and Additional Information
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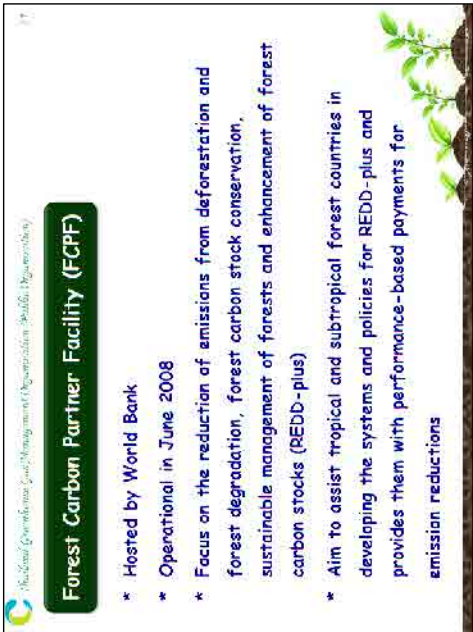
UN03-13	Target Group: G		Key Points - For REDD mechanism, REL and RL are brought to use for assessing baseline scenario.	Reference and Additional Information
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UN03-14	Target Group: G		Key Points - The causes relate each other.	Reference and Additional Information
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UN03-15	Target Group: G	Main Causes of Deforestation and Forest Degradation Geist and Lambin, 2002 * Infrastructure extension roads, railroads, etc. * Markets public & private, e.g. sawmills * Settlements rural & urban * Public Services water lines, electrical grids, sanitation, etc. * Private Company hydropower, mining, oil exploration	Key Points	Reference and Additional Information	Key Points	Reference and Additional Information
UN03-16	Target Group: G	Main Causes of Deforestation and Forest Degradation Geist and Lambin, 2002 * Agricultural expansion Permanent Cultivation large-scale vs. smallholder subsistence vs. commercial * Shifting Cultivation slash & burn vs. traditional swidden * Cattle Ranching large-scale vs. smallholder * Colonization	Key Points	Reference and Additional Information	Key Points	Reference and Additional Information

UN03-17	Target Group: G Main Causes of Deforestation and Forest Degradation Geist and Lambin, 2002 - Wood extraction - Commercial: State-run, private, growth coalition, etc. - Fuel wood: mainly domestic use - Pole wood: mainly domestic use - Charcoal production: domestic & industrial uses	Key Points Reference and Additional Information
UN03-18	Target Group: G Driving Forces of Deforestation and Forest Degradation Geist and Lambin, 2002 - Demographic factors - Economic factors - Technological factors - Policy & Institutional factors - Cultural factors	Key Points Reference and Additional Information

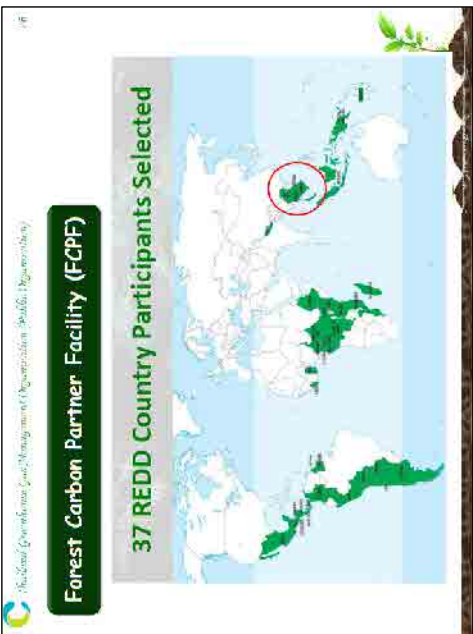
UN03-19	Target Group: G  The diagram illustrates the Payment of Ecological Services (PES) concept. It shows a cycle where land use leads to hydrological effects, carbon sequestration, and biodiversity conservation. These services are then provided to water users, who in turn pay providers. The diagram also shows the resulting welfare for water users, carbon buyers, and beneficiaries. The source is cited as Pagiola and Platals, 2005.	Key Points - The basic concept of the PES. Reference and Additional Information
UN03-20	Target Group: G  The list details national initiatives for PES across several countries: Colombia (Cauca Valley water user associations), Costa Rica (FONAFIFO/Pagos por servicios ambientales (PSA), Heredia: Environmentally adjusted water tariff), Ecuador (Quito: FONAG), El Salvador (Mesa permanente de servicios ambientales, Tecuba, San Francisco de Menéndez, Yamabal), Mexico (Pago por servicios ambientales Hidrológicos (PSAH), Coatepec), Venezuela (CVG-Edesca payments for conservation of Río Caroní), and South Africa (Working for Water Program). The source is cited as Pagiola and Platals, 2005.	Key Points Reference and Additional Information

UN03-21	Target Group: G
 The Global Environment Fund/Management Organization (GEF/MO) is a joint venture of the World Bank, the Inter-American Development Bank (IDB), and the African Development Bank (AfDB). Forest Carbon Partner Facility (FCPF) * Hosted by World Bank * Operational in June 2008 * Focus on the reduction of emissions from deforestation and forest degradation, forest carbon stock conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD-plus) * Aim to assist tropical and subtropical forest countries in developing the systems and policies for REDD-plus and provides them with performance-based payments for emission reductions	
Key Points	Reference and Additional Information

UN03-22	Target Group: G
 The Global Environment Fund/Management Organization (GEF/MO) is a joint venture of the World Bank, the Inter-American Development Bank (IDB), and the African Development Bank (AfDB). Forest Carbon Partner Facility (FCPF) * Objectives of the program - To build capacity for REDD-plus in developing countries - To test a program of performance-based incentive payments in some pilot countries	
Key Points	Reference and Additional Information

UN03-23	Target Group: G	Key Points Reference and Additional Information
UN03-24	Target Group: G	Key Points Reference and Additional Information

UN03-25	Target Group: G		Key Points	Reference and Additional Information
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UN03-26	Target Group: G		Key Points - Thailand is the one of the REDD country that participated in Forest Carbon Partner Facility (FCPF) program.	Reference and Additional Information
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UN03-27	Target Group: G	 UN-REDD Program * Established in 2008 by FAO, UNDP & UNEP * Works together with FCPF, FIP and other SFM/REDD+ initiatives and programs * Capacity building focus * 9 pilot countries: Bolivia, Democratic Republic of Congo, Indonesia, Panama, Papua New Guinea, Paraguay, United Republic of Tanzania, Viet Nam and Zambia * 18 other countries be the observers	Key Points	Reference and Additional Information
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UN03-28	Target Group: G	 UN-REDD Program * Current funding: US\$ 105 million * Donor countries => Norway => Denmark => Spain * Governed by Policy Board => Meets 2-3 times a year * Secretariat in Geneva	Key Points	Reference and Additional Information
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UN03-29	Target Group: G		Key Points	Reference and Additional Information
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UN03-30	Target Group: G		Key Points	Reference and Additional Information
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Carbon Footprint

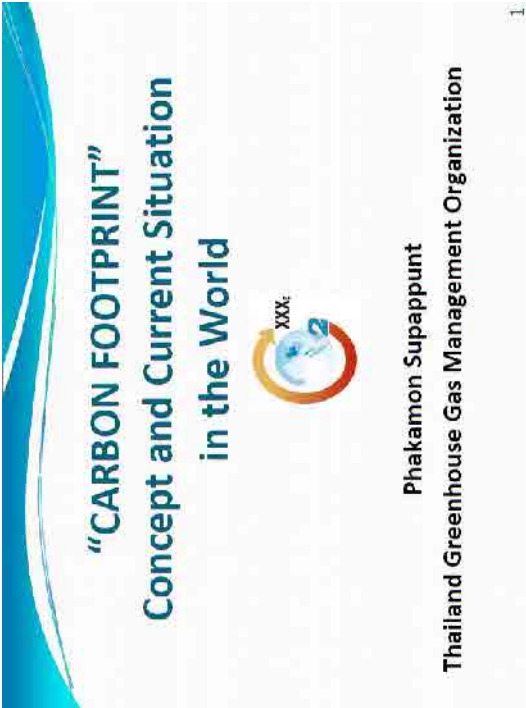


Target Groups

Code	Target group
G	General audience Entity who might apply to carbon footprint

Update History

Version	Date	Update Contents
01	20/01/2011	Initial adoption

CFP01-01	Target Group: G	 The slide features a blue wavy graphic on the left. The main title is "CARBON FOOTPRINT" in large, bold, black letters, followed by the subtitle "Concept and Current Situation in the World" in smaller black letters. In the center is a circular logo with a globe, a blue arrow, and the text "XXX, 2". At the bottom, the text "Phakamon Supappunt" and "Thailand Greenhouse Gas Management Organization" is displayed. A small number "1" is in the bottom right corner.	
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CFP01-02	Target Group: G
	
Key Points	Reference and Additional Information

CFP01-03	Target Group: G
	
Key Points	Reference and Additional Information

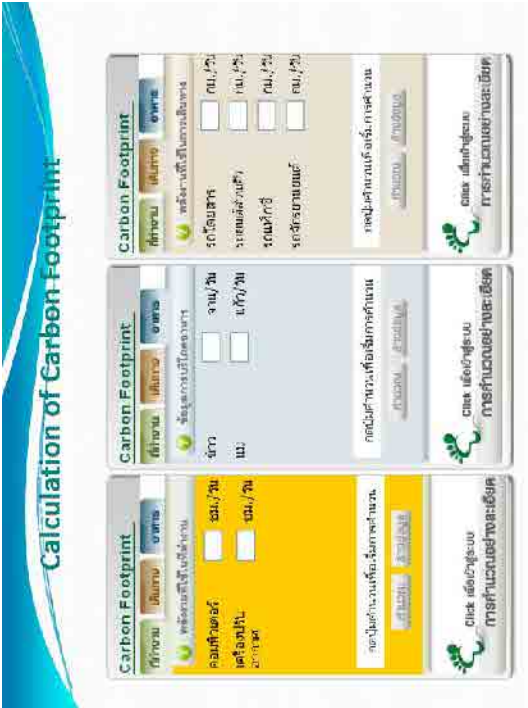
CFP01-04	Target Group: G
 Benefits of Carbon Footprint • For manufacturers: • Manufacturers can have a clear picture of their GHG emission, as well as plan GHG reductions in an effective manner. • Manufacturers can use this as a marketing tool to demonstrate their commitment to reducing GHG emissions. • For consumers: • They may use this information as one of the decision making tools when purchasing products and services. • They can decide to be part of the reduction of GHG emissions directly, thus taking part in tackling the issue of climate change more easily. 4	
Key Points Carbon Footprint will give manufacturers • clear picture of product GHG life cycle • identifying GHG reductions in each life cycle stage. For consumers, • Carbon Trust study shows that nearly two thirds of UK consumers are more likely to buy from a business they think is taking action to tackle climate change (www.carbontrust.co.uk) • Consumer Survey in Japan (Mar.09) show positive answers if CFP information is available (Atsushi INABA)	Reference and Additional Information

CFP01-05	Target Group: G
 Type of Carbon Footprint • Daily activities • Carbon Footprint of product • Carbon Footprint of organization	
Key Points .	Reference and Additional Information

CFP01-07	Target Group: G	GHG emission from food consumption <table border="1"> <thead> <tr> <th>kind of food</th><th>GHG emissions (kg CO₂e/kg of food)</th><th>kind of food</th><th>GHG emissions (kg CO₂e/kg of food)</th></tr> </thead> <tbody> <tr> <td colspan="4">Carbohydrate</td></tr> <tr> <td>1 rice</td><td>0.08</td><td>1 cabbage</td><td>0.56</td></tr> <tr> <td>2 serial</td><td>1.80</td><td>2 onion</td><td>0.20</td></tr> <tr> <td>3 bread</td><td>0.70</td><td>3 tomato</td><td>1.15</td></tr> <tr> <td colspan="4">Protein</td></tr> <tr> <td>1 beef</td><td>14.8</td><td>4 lettuce</td><td>3.30</td></tr> <tr> <td>2 shrimp</td><td>3.94</td><td>5 cucumber</td><td>3.38</td></tr> <tr> <td colspan="4">Fruit</td></tr> <tr> <td>3 pork</td><td>3.0</td><td>1 apple</td><td>0.54</td></tr> <tr> <td>4 chicken</td><td>1.1</td><td>2 orange</td><td>0.23</td></tr> <tr> <td colspan="4">Beverage</td></tr> <tr> <td>1 soft drink</td><td>0.56</td><td>3 banana</td><td>0.45</td></tr> <tr> <td>2 milk</td><td>1.86</td><td></td><td></td></tr> <tr> <td>3 coffee/tea</td><td>7.96</td><td></td><td></td></tr> </tbody> </table> Source: Web based Thai Carbon Footprint Calculator (2006)	kind of food	GHG emissions (kg CO ₂ e/kg of food)	kind of food	GHG emissions (kg CO ₂ e/kg of food)	Carbohydrate				1 rice	0.08	1 cabbage	0.56	2 serial	1.80	2 onion	0.20	3 bread	0.70	3 tomato	1.15	Protein				1 beef	14.8	4 lettuce	3.30	2 shrimp	3.94	5 cucumber	3.38	Fruit				3 pork	3.0	1 apple	0.54	4 chicken	1.1	2 orange	0.23	Beverage				1 soft drink	0.56	3 banana	0.45	2 milk	1.86			3 coffee/tea	7.96			Key Points - The estimation of Carbon footprint from food production and consumption is complicated, which involves the use of fertilizer, water, pesticide, hormone, energy. Finished food products, whether meat or grain, have to be transported, packaged, and sold. - Meat products have a larger carbon footprint than fruits, vegetables and grains; - Cows, sheep, and goats naturally emit methane, a greenhouse gas 21 times more potent than carbon dioxide - Energy inputs associated with the production of feed for animals (very high) Reference and Additional Information - The length of time it takes to grow animals to maturity as compared to plants (much more energy to feed them) and their weight (a factor in transport emissions). - Note: some environmentalists are calling for the carbon footprint of all meat sold in the UK to be shown on the label and some even think that high carbon footprint meat should attract an environmental tax. (www.carboncounted.co.uk/meat-have-high-carbon-footprint.html)
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CFP01-06	Target Group: G	Carbon Footprint in daily activities Source: carbonfootprint.com (2010)	Key Points Carbon Footprint in Daily activities: we all have carbon footprint in both household, office - several kinds of electricity appliance products - Carbon footprint on travelling, - Carbon footprint on working in office - Carbon footprint from consuming various kinds of food. Reference and Additional Information
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CFP01-08	Target Group: G
	
Key Points If one wants to calculate his/ her carbon footprint - visit TGO website (www.tgo.or.th) : TGO has developed the Carbon Footprint Calculator (available in Thai only) - To give information on person carbon footprint - Carbon footprint calculator will ask you to input your activities data: • Electricity appliance products Electricity use at home and office, • Your travelling habits (by bus or train or car and how often to fly) • Your personal eating habits (meat, milk, rice, fruit etc) - Result : amount of GHG you emit	Reference and Additional Information

CFP01-09	Target Group: G
	
Key Points Website asks you to insert information about • Amount of electricity use in the office (computer and AC use) • Food consumption (milk and rice) • Traveling or commuting (except airplane use)	Reference and Additional Information

CFP01-11

Target Group: G



Key Points

Also input information about the energy consumption in your house: what kind of office appliances you use and for how long you use it.

Reference and Additional Information

CFP01-10

Target Group: G



Key Points

Also input energy consumption in your house

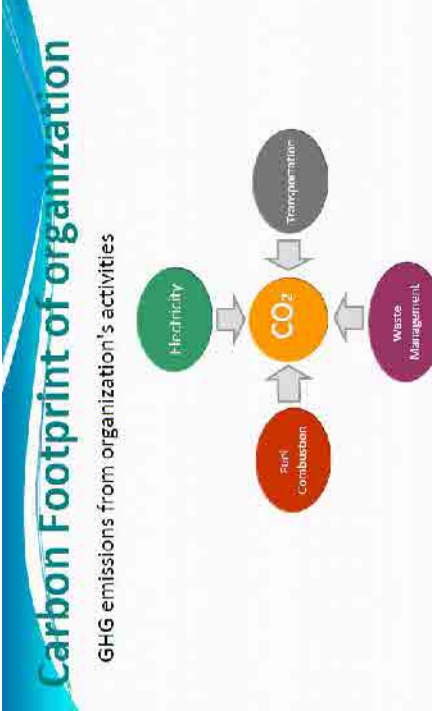
- what type of lighting equipment, and how long you use them

Reference and Additional Information

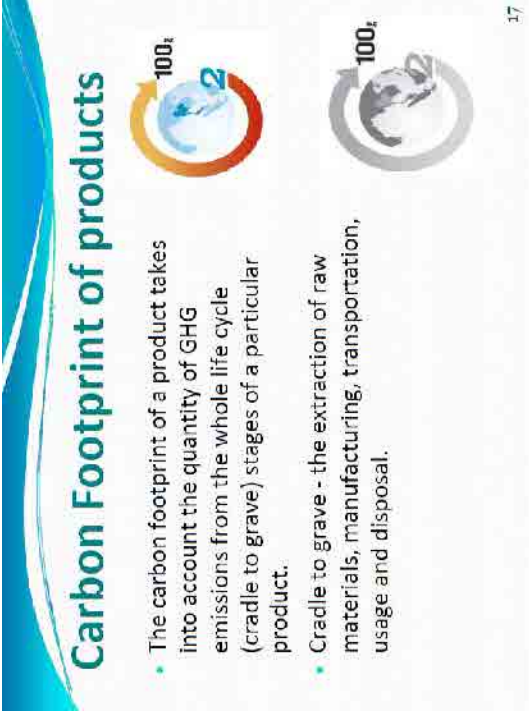
CFP01-13	Target Group: G	
Key Points Finally the program will show the result - How big is your Carbon Footprint in a year - Program lets you know if you can offset your carbon footprint, using example of how much area of trees you have to plant in a year. Note - Teak plantation 1 rai can offset GHG 1.2 Ton CO_{2e}		Reference and Additional Information

CFP01-12	Target Group: G	
Key Points Information on your travel, both car and airplane use will be counted		Reference and Additional Information

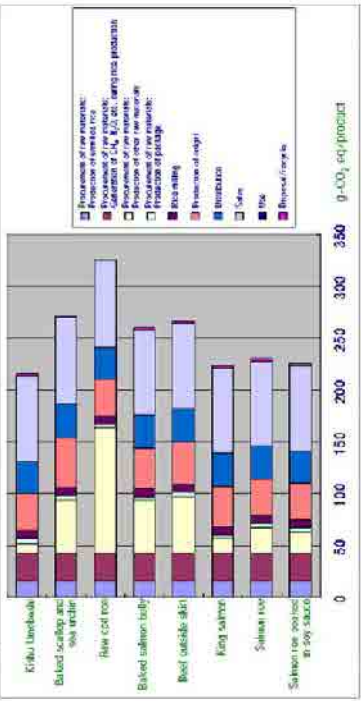
CFP01-14	Target Group: G
	
Key Points And the program will give you recommendations on changing your behavior in order to minimize your carbon footprint	Reference and Additional Information

CFP01-15	Target Group: G
 GHG emissions from organization's activities Source: WBCSD (2004) The GHG Protocol 15	
Key Points The Greenhouse Gas Protocol (GHG Protocol) was jointly convened in 1998 by the World Business Council for Sustainable Development (WBCSD) and the World Resources Institute (WRI). The GHG Protocol categorizes GHG emissions into 3 scopes: Scope 1: All direct GHG emissions. Scope 2: Indirect GHG emissions from consumption of purchased electricity, heat or steam. Scope 3: Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. T&D losses) not covered in Scope 2, outsourced activities, waste disposal, etc.	Reference and Additional Information GHG Protocol link http://www.ghgprotocol.org/standards

CFP01-16	Target Group: G		Key Points Example of the carbon footprint of organization which evaluates carbon Footprint in business activity	Reference and Additional Information
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CFP01-17	Target Group: G		Key Points	Reference and Additional Information
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CFP01-18	Target Group: G
Structural Elements of Carbon Footprint: 5 life cycle stages (LCA) CO₂: 15g CO₂: 5g CO₂: 10g CO₂: 30g CO₂: 5g CO₂: 65g Business to Business (B2B) Business to Consumer (B2C) Some data information is Pearson's internal 2020. Some numbers are hypothetical values.	
Key Points Scope of Carbon footprint calculation: 2 types of Carbon footprint. 1. whole life cycle carbon footprint that calculates in 5 stages (extraction of raw material –disposal): called B2C or Business-to-Consumer. 2. calculation covers only from extraction of raw material to transportation to another business customer (3 stage): called B2B or Business-to-Business - It will be B2B or B2C calculation, it depends on the type of product - end product – B2C - product in supply chain - B2B For example; - Coca Cola in can: B2C - 5 stage - TULC can : B2B - 3 stage	Reference and Additional Information

CFP01-19	Target Group: G
Key Points Result of Carbon Footprint calculation shows • amount of GHG emission in each product's life cycle • identifying GHG reductions in each life cycle stage. The slide shows the carbon footprint calculation results for Onigiri (rice ball). The result show that Raw Cod roe Onigiri is the most highest Carbon footprint from raw material. It is Cod fish stay in the deep sea so it needs to use so much energy by seagoing ship	Reference and Additional Information
CFP01-19	Interpretation of calculation results Exp. CFP calculation results for Onigiri  * The values listed above are results of the primary data calculation using certain assumptions, and therefore do not represent the final CFP for this product. The values may not be consistent with those to be presented at the Eco Products 2008 or any calculation results based on PCR that will be developed. Source: Mizuki's Information & Research Institute (2009)

CFP01-21	Target Group: G	Carbon Footprint situation in the world © TRAVAX, Health Protection Scotland
Key Points Carbon Footprint situation in the world, there are many countries which already have the Carbon Footprint registration system. - First country in the world: France - Second: UK (very famous) - Each country has its own national standard		Reference and Additional Information

CFP01-20

Target Group: G

Example: CFP communication

Enterprise	Nippon Meat Packers, Inc.
Product of the carbon footprint	upper grade "Mori-no-Kaori" Arabiki Wiener (coarse ground pork sausage)
Quantity	92 g

Stage	Material Production	Product Mfg.	Transportation	Retailing	Usage / Recycling	Total
GHG Emission g-CO ₂ /P	111	75	3	53	Out of Boundary	248
Calculation condition	-The GHG emission in Retailing Stage was calculated using secondary data donated from the secretariat. -The GHG emission originated in air condition, wastewater treatment, etc. were obtained using allocation of total number of products produced in the manufacturing site. -The GHG emission in Transportation Stage was calculated with the product weight and collected data of transportation distance.					

エコプロダクツ2008出展
カーボンフットプリント算出報告書
Environmental report for Eco-Products 2008
Exhibition

Source: Inaba (Jan. 2010)

Key Points

Example of carbon footprint of pork sausage which calculated by Nippon Meat Packers. The results show the highest GHG emission come from material production stage

Reference and Additional Information

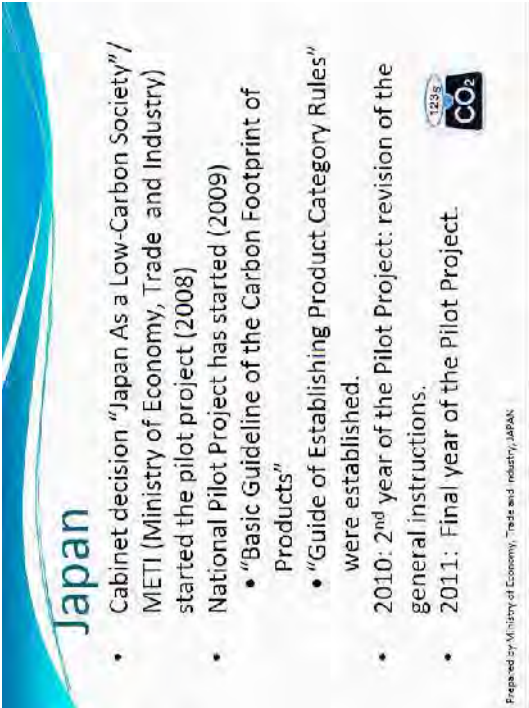
CFP01-22	Target Group: G
Carbon Footprint logo of countries The image displays a collection of carbon footprint logos from various countries and organizations. The logos include: France: 'INDICE CARBONE 55g de CO2 VOIR AU DOS' and a circular logo with 'CO2' and '55g'. Canada: 'CARBON 1575 kg' and 'KOLDIOXID-märskande 1575 kg'. Korea: '100g CO2' with Korean text. Japan: '123g CO2'. Sweden: 'KOLDIOXID-märskande 1575 kg'. Swiss: A circular logo with 'CO2' and '55g'. U.K.: '700g CO2 per wash U.K.' with a footprint graphic. Carbon Trust: 'working with the Carbon Trust'.	
Key Points	Reference and Additional Information

CFP01-23	Target Group: G
French Republic The image displays information and logos related to the French Republic's carbon footprint initiatives. It includes: CASINO: 'CASINO has developed their own carbon labelling schemes: CASINO's carbon index'. ADEME: 'The French Agency for the Environment and Energy Management (ADEME)'. National Standard: 'National Standard'. Organization: 'Bilan Carbone'. Product: 'Bilan Produit'. Policy: 'policy on environmental information of products that will be mandatory in France by 01 Jan 2011. Carbon footprint will be one of the multiple criteria applied.'	
Key Points	Reference and Additional Information

CFP01-25	Target Group: G	CFP communication of UK Chart 2 Product carbon footprint: Status quo (excluding Consumer Use phase) Chart 3 Product carbon footprint: Status quo Chart 4 Product carbon footprint: Status quo (20% reduction)	Key Points Example of CFP communication of UK: Botanic shampoo - Left : GHG emission of 4 life cycle stage (not including consumer use phase) - Right: GHG emission of all life cycle stage CFP information show: - Highest emission: use phase from electricity (warm water) - Consumer can use this information for reduction of GHG emissions	Reference and Additional Information
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CFP01-24	Target Group: G	United Kingdom - DEFRA (Department for Environment, Food and Rural Affairs); Carbon Trust, BSI (British Standards Institute), 2007 - National Standard: PAS 2050:2008 - About 1,000 certified products (June, 2010) Telling steps to reduce our carbon footprint Product design, Production, Distribution, Consumer use, End-of-life management	Key Points Tesco asks suppliers to reduce carbon footprint. TESCO sent a letter to its major suppliers asking them to reduce their carbon footprint by 30% before 2020.	Reference and Additional Information
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CFP01-26	Target Group: G	
	 Germany • “Product Carbon Footprint, Pilot Project Deushland” supported by government (2008)” • National Standard: Product Carbon Footprint • The Blue-Angel, the well-recognized ecolabel already existing in Germany, along with climate protection symbol will be used as the carbon labelling scheme in Germany.	Key Points Reference and Additional Information

CFP01-27	Target Group: G	
	 Japan • Cabinet decision “Japan As a Low-Carbon Society”/ METI (Ministry of Economy, Trade and Industry) started the pilot project (2008) • National Pilot Project has started (2009) • “Basic Guideline of the Carbon Footprint of Products” • “Guide of Establishing Product Category Rules” were established. • 2010: 2nd year of the Pilot Project: revision of the general instructions. • 2011: Final year of the Pilot Project. Prepared by Ministry of Economy, Trade and Industry, JAPAN	Key Points Reference and Additional Information

CFP01-28	Target Group: G 	Key Points • Japan launched a three year national CFP pilot project in April 2009. • In October 2009, the first CFP label was authorized for use. • By 18th January 2010, 24 CFP labels had been authorized under 4 the Japanese CFP Pilot Program. Reference and Additional Information
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CFP01-29

Target Group: G

Japan: CFP situation in 2009

- Number of authorized CFP labels: 94

CV-AB-02-04	Rice (Japanica Rice)	AECN Co., Ltd.
CV-1A-00	Rice (Japanica Rice)	Ryomureikan University, AECN Co., Ltd.
CV-AB-01-02	Refined oil	AECN Co., Ltd.
CV-AL-01-02	Washing powder	AECN Co., Ltd.
CV-AL-01	Carbohydrate (sauce flavor)	KANUKU Co., Ltd.
CV-AL-01-02	Sauces (sauce flavor)	Calbee Foods Co., Ltd.
CV-AH-01-03	Pouch-packed rice	AECN Co., Ltd.
CV-AH-01-05	Ham and Sausage	Nippon Meat Packers, Inc.
CV-AL-01	Biscuits	Kikkaido Sake Co., Ltd.
CV-AH-01-03	Organic Fertilizer	Earth Support Corporation

* AECN Co., Ltd. sells these products for year-end gifts.

Reference: http://www.cfp-japan.co.jp/cfp_label/verify/cfp_label/



Waseda University, Japan, GEN2013 Conference, OCT 2016

Key Points

Example pilot companies in Japan are Nestle, Panasonic, Toshiba, Lion, Lawson, Seiyu, Calbee

Reference and Additional Information

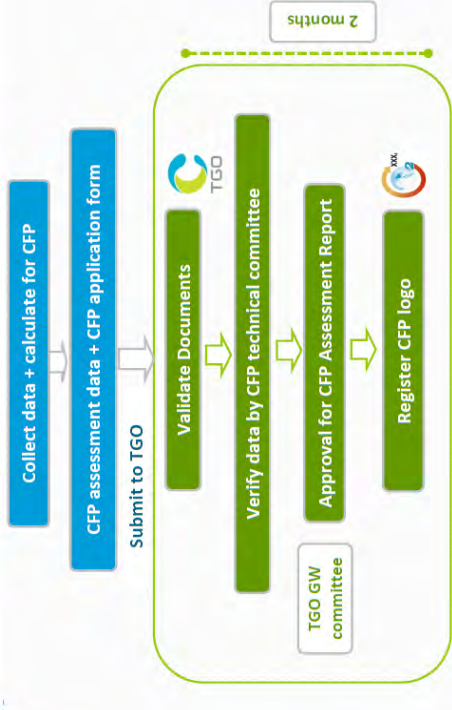
CFP01-30	Target Group: G
 Carbon Footprint of Product Standard - PAS 2050: 2008 (Specification for the assessment of the life cycle greenhouse gas emissions of goods and services (U.K., 2008)) - Technical Specification: General principles for the assessment and labelling of Carbon Footprint of Products (Japan, 2009) - Climate Labelling of Food (Sweden) - Bilan Carbone (France) - Korean Guideline (Korea) - ISO 14067: Carbon Footprint of Products (Part I: Quantification; Part II: Communication) (tentative 2011)	
Key Points There are many Carbon Footprint of Product standards. National standard: - PAS 2050: 2008 (Specification for the assessment of the life cycle greenhouse gas emissions of goods and services (U.K., 2008)) - Technical Specification: General principles for the assessment and labelling of Carbon Footprint of Products (Japan, 2009) - Climate Labeling of Food (Sweden) - Bilan Carbone (France) - Korean Guideline (Korea) International standard - ISO 14067: Carbon Footprint of Products (Part I: Quantification; Part II: Communication) (tentative 2011)	
Reference and Additional Information	

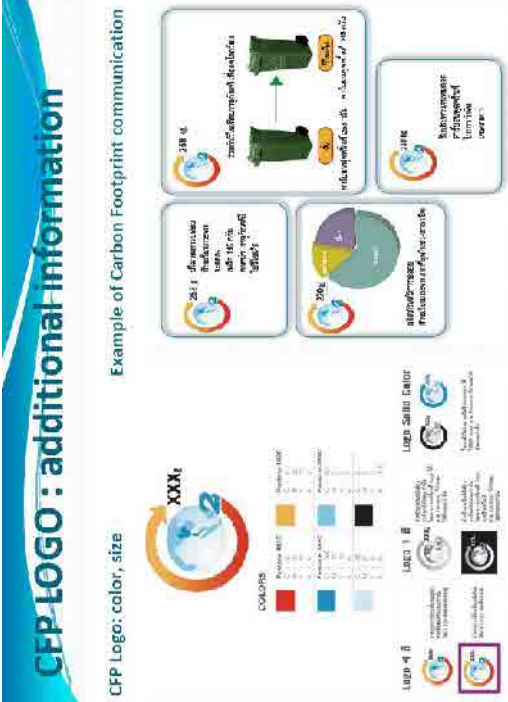
CFP01-31	Target Group: G
 "Carbon Footprint of Products" Project in Thailand - TGO and MTEC launched the "Carbon Footprint of Products" Project in Thailand in 2009. - Objectives: - To promote the use of a carbon footprint on Thai products; which in turn could increase the competitiveness of Thai industries in the world market. - To support the Thai industrial sectors in implementing the low carbon trend in Thailand.	
Key Points TGO, in response to climate change negotiations, must take part in promoting a low carbon society. One of the tools we have developed along with MTEC is the Carbon Footprint of Products Project in Thailand since 2009.	
Reference and Additional Information	

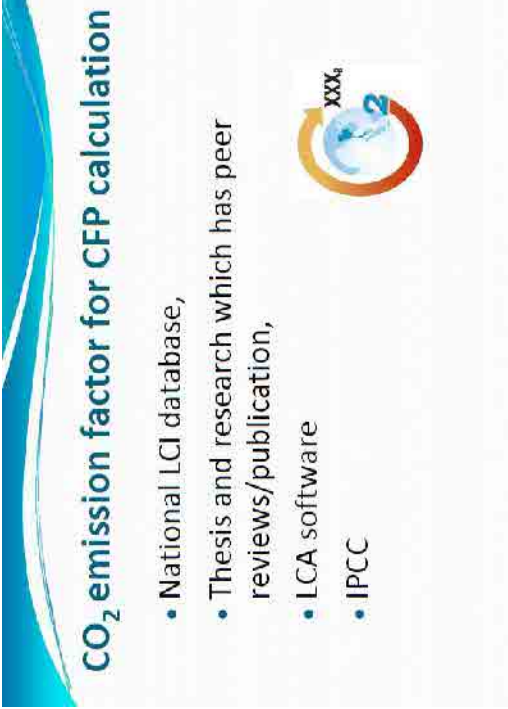
CFP01-32	Target Group: G
 Results from pilot phase - In December 2009 and April 2010, TGO announces the results of its first phase where 22 producers in 42 products certified - CFP certified products, e.g., - T-shirt (100% cotton), Nylon yarn, Carpet, TULC can, Ceramic tiles, Paper, Paper container, Sterile food packaging, Copying machine, Air conditioner, PP cup - Coca Cola in can, Rice flour, Jasmine rice, Teriyaki chicken meat, Fresh chicken meat, Meat stick, Instant noodle, Canned tuna, Pineapple juice, Airline food, Chicken feed mill	Key Points Key results from the pilot phase: - In November 2009, TGO announced the results of its first pilot phase (dating from April to November 2009), - The certified products from the pilot phase include a wide variety of products, such as: T-shirt (100% cotton), Nylon yarn, Carpet, TULC can, Ceramic tiles, Paper, Paper container, Sterile food packaging, Plastic-fiber pellet, Copying machine, Air conditioner, Tire, PP cup, Coke can, Rice flour, Jasmine rice (2), Teriyaki chicken meat, Fresh chicken meat, Meat stick, Instant noodle, Canned tuna, Pineapple juice, Airline food, Chicken feed mill Reference and Additional Information

CFP01-33	Target Group: G
 The National Guidance on Carbon Footprint Calculation for Products - Scope - Normative reference - Terms and definitions - B2B, B2C assessment - GHG source, unit - GWP - Time period - Unit of analysis - Supporting data - Etc. - Methodology framework - Calculate method - Number of carbon footprint - Emission factor - Etc.	Key Points - During the pilot project, TGO developed The National Guidance on Carbon Footprint Calculation for Products, which includes the carbon footprint calculation methodology consisting of the framework, data collection, and supporting data, among others. - Companies, who would like to apply for CFP, can use the National Guidance for calculation of carbon footprint of their products - The guidance can be downloaded for free from the TGO website (www.tgo.or.th) (both in Thai and English version) Reference and Additional Information

CFP01-34	Target Group: G  Criteria of CFP LOGO - Each product that applies for the carbon footprint logo is charged 50,000 THB as a registration, verification data, administrative cost, with an additional fee of 500 THB for the application form. - The certified product shall be eligible to use the CFP logo for 2 years. - Both the guidelines and criteria for CFP label are available for a free download from the TGO website (www.tgo.or.th) since February 2010.	Key Points This is about the LOGO and labeling of CFP. Criteria of the carbon footprint of product logo was developed at the same time as National Guidance on Carbon Footprint Calculation for Products. Each product that applies for the carbon footprint label is charged 50,000 THB; • application form 500 THB • Administrative 10,000 THB • CFP logo 4,000 THB/product Reference and Additional Information
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CFP01-35	Target Group: G CFP registration process in Thailand  The flowchart illustrates the CFP registration process in Thailand. It starts with 'Collect data + calculate for CFP', followed by 'CFP assessment data + CFP application form'. This leads to 'Submit to TGO'. The process then enters a 2-month period (indicated by a dashed line) containing three steps: 'Validate Documents' (with TGO logo), 'Verify data by CFP technical committee' (with TGO GW committee logo), and 'Approval for CFP Assessment Report' (with TGO logo). The final step is 'Register CFP logo' (with TGO logo).	Key Points Non CFP experience A manufacturer may pay CFP consultant for consulting service (around 8,000-12,000 THB/day) depending on type of products and further requirements from manufacturer. Reference and Additional Information
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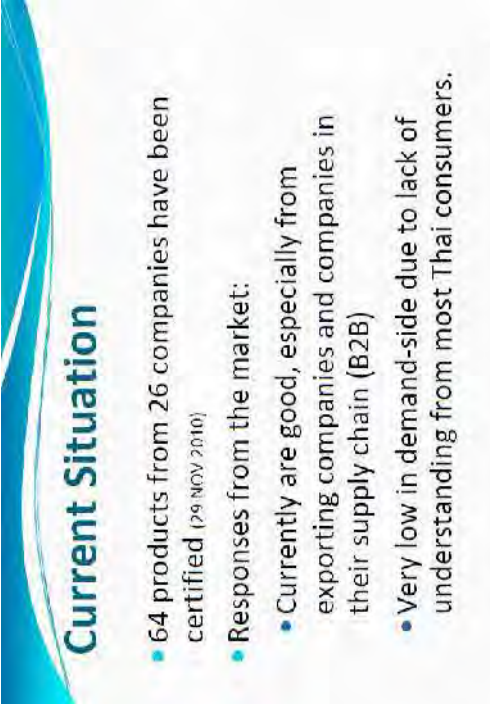
CFP01-36	Target Group: G	
		
Key Points For specific products, such as for canned Coca Cola, the CFP logo illustrates that the GHG emissions will reduce from 258 grams to 145 grams if the consumer recycles the can.		Reference and Additional Information

CFP01-37	Target Group: G	
		
Key Points For carbon footprint calculation, - we will use data from <u>National LCI Database for Thailand</u>, which is a database of emission factors for calculating the carbon footprint, - if there is no national data we will use data from <u>thesis and research</u> which has peer reviews and publication, or <u>LCA software</u>. - If we have no data from the Thai LCI database, from research or from LCA software, we will use data from <u>IPCC</u>.		Reference and Additional Information

CFP01-38	Target Group: G
 Current Status of Thai LCI Database - WG1: Natural Gas - WG2: Refinery - WG3: Petrochemical - WG4: Ferrous & Non-ferrous - WG5: Infrastructure/Transportation - WG6: Construction Materials - WG7: Agriculture/Agro-products - WG8: Basic chemicals - WG9: Recycle/Waste Management - WG10: Others (Automotive Parts, Textile, Seasoning, Herbal Cosmetics) MTEC a member of NSTDA 38	
Key Points LCI= Life Cycle Inventory	Reference and Additional Information

CFP01-39	Target Group: G
 MOU signed for developing National LCI Database The Federation of Thai Industry MTEC a member of NSTDA National Metal and Materials Technology Center Department of Industrial Works Ministry of Industry Thailand Thailand Environment Institute Ministry of Natural Resources and Environment Thailand Research Fund Technical Support by Japanese Government through Green Partnership Plan (GPP) Project Financial Support by Thai Government 39	
Key Points	Reference and Additional Information

CFP01-40	Target Group: G	
		Key Points TGO held a Carbon Footprint exhibition on 25 Dec. 2009 and on 9 April 2010 to promote the products that carry the CFP logo and to inform manufacturers in Thailand about the importance of a CFP for their products. Reference and Additional Information

CFP01-41	Target Group: G	
		Key Points Reference and Additional Information

CFP01-42	Target Group: G	CFP Pilot companies/products of Thailand
Key Points Some examples of products that have a CFP label in Thailand		Reference and Additional Information

CFP01-43	Target Group: G	Verification Sheet (1) <table><tr><th>Form</th><th>Details of the product,</th><th>Code Form</th><th>Fr-01</th></tr><tr><td rowspan="3">I</td><td>Document name</td><td colspan="2">Staff TGO.</td></tr><tr><td>Document number</td><td colspan="2">Staff TGO.</td></tr><tr><td>Company name</td><td colspan="2"></td></tr><tr><td></td><td>Product name</td><td colspan="2"></td></tr></table> Note : to provide information related to the product e.g., functional unit, reference specifications, PCR etc... <i>Application for registration of a product</i> Image of products <table><tr><td>Company name</td><td></td></tr><tr><td>Address</td><td></td></tr><tr><td>Product name and Model</td><td></td></tr><tr><td>Production capacity per year</td><td></td></tr><tr><td>Technical information</td><td></td></tr><tr><td>Reference PCR</td><td></td></tr><tr><td>Date for registration</td><td></td></tr></table>	Form	Details of the product,	Code Form	Fr-01	I	Document name	Staff TGO.		Document number	Staff TGO.		Company name				Product name			Company name		Address		Product name and Model		Production capacity per year		Technical information		Reference PCR		Date for registration		Key Points TGO developed the verification sheet: - Manufacturers can use this sheet for CFP calculations - And it can be downloaded from TGO's website Reference and Additional Information
Form	Details of the product,	Code Form	Fr-01																																
I	Document name	Staff TGO.																																	
	Document number	Staff TGO.																																	
	Company name																																		
	Product name																																		
Company name																																			
Address																																			
Product name and Model																																			
Production capacity per year																																			
Technical information																																			
Reference PCR																																			
Date for registration																																			

CFP01-44	Target Group: G
 Data Verification • Low material/energy consumption • Scenario (production/use phase) • Transportation • CO₂ emission factor (value/reference) • Allocation method • Product Categories Rule (if any) • Calculation sheet for each life cycle stage	
Key Points Data, which manufacturers have to fill in the verification sheet for CFP calculation, consists of • Raw material use/ energy consumption • Scenario (production/ use phase) • Transportation • CO₂ emission factor (value/ reference) • Allocation method • Product Categories Rule (if any) • Calculation sheet for each life cycle stage	Reference and Additional Information

CFP01-45	Target Group: G												
 Verification Sheet (2) Carbon Footprint Number 950 kg GHG emissions of each life cycle stage <table border="1"> <thead> <tr> <th>Life Cycle Stage</th> <th>GHG Emissions (kg)</th> </tr> </thead> <tbody> <tr> <td>Material Procurement</td> <td>~1100</td> </tr> <tr> <td>Manufacture</td> <td>~250</td> </tr> <tr> <td>Transportation</td> <td>~150</td> </tr> <tr> <td>Use</td> <td>~50</td> </tr> <tr> <td>Disposal</td> <td>~20</td> </tr> </tbody> </table>		Life Cycle Stage	GHG Emissions (kg)	Material Procurement	~1100	Manufacture	~250	Transportation	~150	Use	~50	Disposal	~20
Life Cycle Stage	GHG Emissions (kg)												
Material Procurement	~1100												
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Disposal	~20												
Key Points After fill in data, it will show manufacturers the amount of carbon Footprint of their product automatically.	Reference and Additional Information												

CFP01-46	Target Group: G
 Responses from private sector (1) • Over 50 manufacturers are interested to apply for the CFP logo, • CFP requested by customer in other countries, e.g., • Maltitol sweetener (B2B): a chewing gum company in USA • Natural starch (B2B): food manufacturers in Japan • Copper rotors (B2B): motor manufacturers in Japan • Increase in export competitiveness • Same product by other manufacturers has CFP certified • Corporate Social Responsibility	
Key Points	Reference and Additional Information

CFP01-47	Target Group: G
 Responses from private sector (2) • Some certified pilot companies want to register carbon footprint in other products • Charoen Pokphand Foods Group: implementing CFP to others over 200 product) • Thai Airways International Airline: other passenger meals	
Key Points	Reference and Additional Information
• Charoen Pokphand Foods Group (largest agribusiness, known has the slogan "Kitchen of the World") after their Teriyaki, fresh chicken meat, Chada Jasmine rice CFP logo. Companies plan to implement the carbon footprint to others 200 products. • Thai Airways International Airline which already got certification for "Kiew-Wan Chicken Curry with steamed rice and Chicken Curry Mussaman with steamed rice, now they are calculating Carbon Footprint other passenger meals such as Fried Chicken with Basil Leaves, Ruby Fish in Red Curry With Coconut Milk	

CFP01-48	Target Group: G	
Key Points		
Reference and Additional Information		

CFP01-49	Target Group: G	

CFP02-03	Target Group: G
What is Life cycle Life cycle of Products input: renewable resources, virgin materials, energy transport Raw material mining → Product manufacturing → Distribution → Consumption/Utilization → Disposal/Recycle output: air pollutants, water pollutants, wastes, GHGs, other emission products Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)	
Key Points There are 5 stages in the LCA to measure the impact assessment of the Life Cycle of products. 1 Raw material mining 2 Product manufacturing 3 Distribution 4 Consumption/Utilization 5 Disposal/Recycle By considering data input/ output from all stages, LCA looks at Life Cycle Assessment of the product involved in the process, which gives an overview of the impact of the product.	
Reference and Additional Information	

CFP02-02	Target Group: G
Contents ➤ What is Life Cycle Assessment (LCA) ? ➤ Examples of LCA ➤ What is the relationship between LCA and Carbon Foot Print (CFP) ? ➤ Calculation of CFP Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)	

CFP02-04	Target Group: G
What is LCA ? (1) ➤ Life Cycle Assessment (LCA) is method to compare environmental impacts of products/ technologies or services with a view to their whole life cycle; ➤ The emissions to all components of environment such as SO₂, COD, hazardous wastes, and CO₂ during product production, use and disposal are considered; ➤ Processes of raw material mining, energy/material production, additional processes or sub-processes are also involved. 	
Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) Reference and Additional Information	
Key Points For consumer: LCA is used for selecting products or technologies by comparing the environmental impact of a product. The purpose of LCA is to get the product or technology that is the most environmentally friendly. LCA is used to know the impact of each component in the process so that all the processes involved reduce the environmental impacts.	

CFP02-05	Target Group: G
What is LCA ? (2) ➤ First LCA was implemented by Coca Cola in the USA, as a comparison of returnable bottle with PET-bottle. ➤ LCA method has fixed structure and is practiced according to international standards ISO 14040 and 14044 from 2006. ➤ The LCA method is one of the most important information tools of environmentally sound product policy. 	
Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) Reference and Additional Information	
Key Points For companies: Companies using LCA have used it to compare the environmental impacts among different products. LCA is the standard series ISO14040-14044 from 2006. LCA is used to determine the company's environmental policy	

CFP02-07	Target Group: G
What is LCA ? (4)	
Key Points The First step of framework LCA is to define the Goal and Scope in order to evaluate the impact of the product or to compare the effects between product A and product B. The second step is Inventory analysis, which is the data collection and involves listing the material input and output such as energy, raw materials pollution, waste, etc. The Third step is the Impact assessment which uses the data from step 2. The goal is to measure the Impact on global warming, such as acid rain or ozone layer destruction. The Last step is the interpretation of data. This helps to reduce emissions in processes. Reference and Additional Information	

CFP02-06	Target Group: G
What is LCA ? (3)	
Key Points Picture shows ISO associated with LCA Life cycle assessment framework - first step Goal and Scope definition - second step Inventory analysis - third step Impact assessment - last step interpretation. Result can be used for: Product development. Environmental strategy. Policies of other marketing purposes. Reference and Additional Information	

CFP02-08	Target Group: G
Examples of LCA  SOURCE: UNEP LCA Training Kit Module 1b – Overview of LCA Which one is better for the environment ?  Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)	
Key Points Slides from here show an example the Goal of life cycle assessment to compare the effects between products Incandescent lamp and Fluorescent lamp Which one is better for the environment?	Reference and Additional Information

CFP02-09

Target Group: G

LCA : Goal and scope definition

LCA Step 1 - Goal definition

Goal: To compare the two products in terms of their impacts to the environment.

Definition:

Product property	Incandescent lamp	Fluorescent lamp
power consumption	60 W	18 W
life span	1000 hr	5000 hr
mass	30 g	540 g
mercury content	0 mg	2 mg

SOURCE: UNEP LCA Training Kit, Module 1b – Overview of LCA

Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)

Key Points

The slide shows an example the Goal of life cycle assessment to compare the effects between products Incandescent lamp and Fluorescent lamp that Which one is better for the environment?

Reference and Additional Information

CFP02-11

Target Group: G

LCA : Impact assessment

LCA Step 3 - Impact Assessment

Equation
Emissions = $\sum$ (activity_i × emission factor_i)
where "i" type for an impact

Impact category	Incandescent lamp	Fluorescent lamp
Climate change	121000 kg CO2-eq	41400 kg CO2-eq
Acidification	3210 kg SO2-eq	1140 kg SO2-eq
Depletion of resources	45 kg Sb2O3-eq	21 kg Sb2O3-eq
Depletion of resources	0.8 kg antimony-eq	0.3 kg antimony-eq

SOURCE: UNEP LCA Training Kit Module 2 – Overview of LCA

Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)

Key Points

Step 3 is the Impact Assessment

list of environmental information to calculate the environmental impact such as the Impact of the Climate change category, Eco toxicity, Acidification, and the Depletion of resources.

Reference and Additional Information

CFP02-10

Target Group: G

LCA : Inventory analysis

LCA Step 2 - Inventory Analysis

Inventory table:

Elementary flow	Incandescent lamp	Fluorescent lamp
CO ₂ to air	800000 kg	500000 kg
SO ₂ to air	1000 kg	80 kg
Copper to water	3 g	20 g
Crude oil from earth	37000 kg	22000 kg

Source: UNEP LCA Training Kit Module 2 – Overview of LCA

Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)

Key Points

Step 2 Inventory Analysis

the data collection items in the environment throughout the life cycle of products that use energy, raw materials, waste and emission in process

Reference and Additional Information

CFP02-13	Target Group: G
LCA : Interpretation LCA Step 4.1 - Interpretation Climate change kg CO₂ eq Incandescent lamp Fluorescent lamp SOURCE: UNEP LCA Training kit Module b – Overview of LCA Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)	
Key Points This slide shows the impact of climate change for two products.	Reference and Additional Information

CFP02-12

Target Group: G

LCA : Interpretation

LCA Step 4 - Interpretation

Process	Incandescent lamp	Fluorescent lamp
Electricity production	88%	60%
Copper production	5%	15%
Waste disposal	2%	10%
Others	5%	15%
Total climatic changes	120000 kg CO2 eq	40000 kg CO2 eq

SOURCE: UNEP LCA Training kit Module b – Overview of LCA

Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)

Key Points

Step 4 shows the areas with the greatest impact to climate change.

One example is the impact caused by the use of electricity from production processes.

Incandescent lamps have more impact on the environment than the Fluorescent lamp, so it can reduce the energy consumption from manufacturing.

Reference and Additional Information

CFP02-14

Target Group: G

Relationship between LCA and Carbon Footprint (CFP)

Theme oriented

Input Allocation

Weighting

CFP

CO₂, CH₄, N₂O, HFCs, PFCs, SF₆

TGD

Key Points

LCA evaluates the different types of impacts. Carbon footprint, but will select only the impact on Global Warming is the main word of emissions from CO₂, CH₄, N₂O, HFCs, PFCs, SF₆ under the Kyoto Protocol.

Reference and Additional Information

CFP02-15	Target Group: G Calculation of carbon footprint @ Carbon Footprint Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)	Key Points A carbon footprint is a measure of the impact human activities have on the environment in terms of the amount of greenhouse gases produced, measured in units of carbon dioxide Reference and Additional Information
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CFP02-16	Target Group: G
How to calculate the Carbon Footprint. LCA Step 1 - Goal definition Business-to-Business Business-to-Consumer Source: Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)	
Key Points Calculation of carbon footprint with 2 scopes depending on the nature of the product. And the needs of producers, including 1. Business to Business keep the data specific Cradle to gate (Factory) 2. Business to Consumer keep the data specific Cradle to grave	Reference and Additional Information

CFP02-17	Target Group: G
How to calculate the Carbon Footprint. LCA Step 2 – Inventory Analysis Source: Guide to PAS 2050 primary data: which are collected by organization secondary data: which are referred to the common data, reference data and other LCA studies Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)	
Key Points Next step is the data collection of material input, output from the process and substance. But what is important to keep the two issues together, the data is to Allocation and Scenario data.	Reference and Additional Information

CFP02-18	Target Group: G
How to calculate the Carbon Footprint. LCA Step 2.1 – Inventory Analysis <u>Allocation</u> Line production has two products or more categories and they may be handled in the same stage of production. Emissions of a single product should be allocated from the total emissions into "Mass stage allocation" and "Economic allocation". <u>Scenario setting</u> If there is no data found in some processes of the life cycle, activities can be assumed at some stages in order to set a common scenario. 	
Source: Guide to PAS 2050 Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)	
Key Points Allocation for line production has two or more categories and Scenario setting is when there is not enough data in some processes for instance in beverage companies, if there is no data regarding the use phase, it can be assumed as 2 hours in the fridge.	
Reference and Additional Information	

CFP02-19	Target Group: G
How to calculate the Carbon Footprint. LCA Step 3 – Impact Assessment <u>Equation</u> GHG emissions = $\sum (\text{activity}_i \times \text{GHG emission factor}_i)$ where "i" stands for a process <u>Collect Data</u> •Energy •Material •Waste Thai National LCI Database, etc 	
Source: Guide to PAS 2050 Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)	
Key Points Next step is to calculate carbon footprint using specific equations. The activity data such as energy consumption or raw material use or amount of waste is multiplied by the EF Thai National LCI Database should be applied , but if there is no data available, data from study/ research or secondary data can be applied.	
Reference and Additional Information	

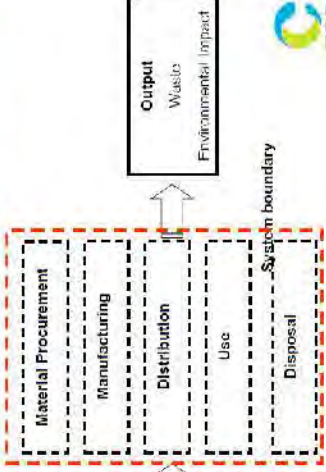
CFP02-20	Target Group: G
Priority to selection emission factor • Thai National LCI Database • Database of Thesis and Research in Thailand (peer-review publication) • LCA Software • IPCC	
Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) Key Points Priority in the selection of the EF. Reference and Additional Information	

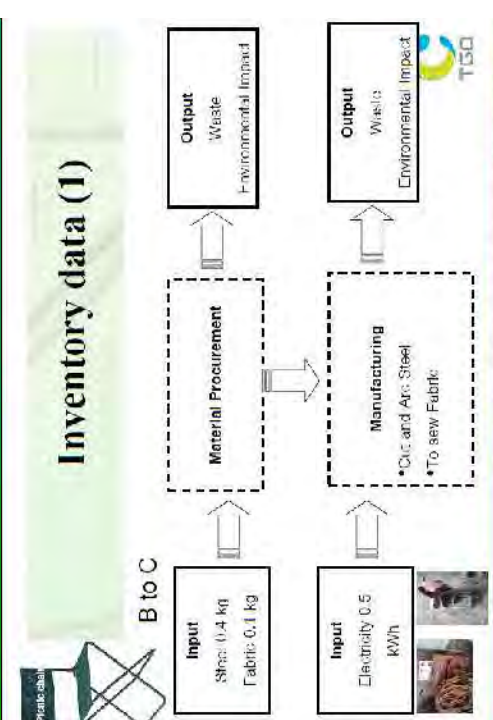
CFP02-21	Target Group: G
How to calculate the Carbon Footprint. LCA Step 4 – Interpretation g CO₂-eq 316 g Material Procurement: 140 Manufacturing: 35 Distribution: 5 Use: 5 Disposal: 130	
Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) Key Points This graph shows CFP of a hypothetical example product. It can be seen that the CO₂ emissions from two stages are quite high, i.e. Material procurement and Disposal stages, which can be main targets to reduce climate change impact. Reference and Additional Information	

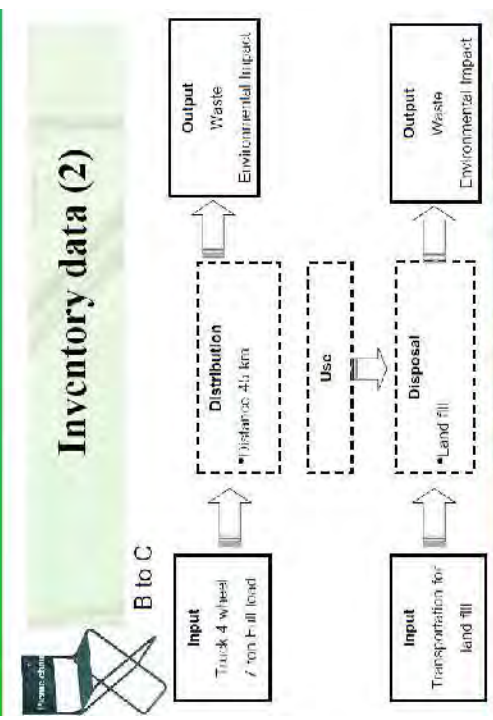
CFP02-22	Target Group: G
 	
 	

CFP02-23	Target Group: G
 	
 	
Key Points Following slides show actual calculation processes. Example is taken for a product of picnic chair. Note that all data is not actual since the actual data is usually confidential	Reference and Additional Information

CFP02-24	Target Group: G
 Goal Scope and Definition Goal: Life Cycle Assessment of Picnic chair. Scope: Business to Consumer Functional unit: Impact/1product Definition: Picnic chair use for sit 	
Key Points Scope 1 CFP to Goal Scope and Definition it same step on LCA but CFP specific Global warming • Goal of picnic chair is Life Cycle Assessment of Picnic chair • Scope: Business to Consumer use five process • Functional unit: Impact/1product • Definition: Picnic chair use for sit Reference and Additional Information	

CFP02-25	Target Group: G
 Inventory data B to C  	
Key Points Obtain and input inventory data in each stage from Material procurement, Manufacturing, Distribution Use Disposal. Common data includes Energy, material, waste. Reference and Additional Information	

CFP02-26	Target Group: G
 Inventory data (1) Input: Steel: 0.4 kg, Fabric: 0.1 kg Material Procurement Output: Waste, Environmental Impact Input: Electricity 0.5 kWh Manufacturing Output: Waste, Environmental Impact B to C Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)	
Key Points Input data in process • Material Procurement involves use of Steel and Fabric • Manufacturing has some sub processes Cut and Arc Steel To sew Fabric use electricity energy Reference and Additional Information	

CFP02-27	Target Group: G
 Inventory data (2) Input: Truck 4 wheel, 7 ton Full load Distribution Output: Waste, Environmental Impact Input: Transportation for land fill Disposal Output: Waste, Environmental Impact B to C Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)	
Key Points Input data in process Distribution is the fuel consumption for transportation Truck (4 wheel 7 ton Full load) Use not use energy and material The last Process Disposal use Energy for land use in scenario. Reference and Additional Information	

CFP02-28

Target Group: G

Summary Inventory data

Process	Energy	Material	Source
Material Procurement	-	Steel = 0.4 kg Fabric = 0.1 kg	Primary data
Manufacturing	Electricity = 0.5 kWh		Primary data
Distribution	Distance = 45 km	-	Secondary data
Use	-	-	-
Disposal	Landfill = 0.5 kg		Secondary data

Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)

Key Points

Summary Inventory data

- Process Material Procurement Use Material ; Steel and Fabric
- Process Manufacturing Use Energy Electricity
- Process Distribution Use Energy Fuel from Truck
- Process Use not use energy and material
- Process Disposal Use Energy Fuel from Truck

Reference and Additional Information

CFP02-29

Target Group: G

Emission Factor

List	Unit	EF(kgCO ₂ e/Unit)	Sources of Data
Steel	kg	1.7600	LCA Software
Fabric	kg	2.1100	LCA Software
Electricity	kWh	0.5610	Thai National LCI Database
Truck 4 wheel 7 ton Full load	ton km	0.1472	Thai National LCI Database
Landfill	kg	2.32	Research in Thailand

TGO

Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)

Key Points

Now the activity data is prepared.

Next step is to identify the EF values of data items to calculate the carbon footprint.

Reference and Additional Information

CFP02-31	Target Group: G
Calculation result Product Picnic chair is released Greenhouse gases equal to 2.35 kgCO₂e 	
Key Points Show result calculated carbon footprint to three significant numbers.	Reference and Additional Information

CFP02-30

Target Group: G

Calculation

Equation

$$\sum (\text{activity}_i \times \text{emission factor}_i) = \text{Emissions}_i$$

Process	Name	Volume (Unit)	EF (kgCO ₂ e/Unit)	Volume (kgCO ₂ e)
Material Procurement	Steel	0.4 kg	1.7500	0.70
	Fabric	0.1 kg	2.1100	0.21
Manufacturing	Electricity	0.5 kWh	0.5610	0.28
Distribution	Truck	0.0225 ton km	0.1472	0.003
Use	-	-	-	-
Disposal	Landfill	0.5 kg	2.32	1.16
All				2.35

Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)

Key Points

Table shows the calculated carbon foot print.

Reference and Additional Information