SCP Discussion
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President , APRSCP (09-11) / ISBITM

University of Surrey
March 27, 2013   Guildford, UK
Global SCP Movement and Global RECP Network

40+ National Cleaner Production Centres (NCPCs)
North American CP Roundtable (US P2, Canadian RT)
Asia Pacific Roundtable for Sustainable Consumption and Production (APRSCP)
European Roundtable for Sustainable Consumption and Production (erScp)
South American Roundtable
African Roundtable
Sustainable Consumption concept is still DEBATIVE (efficiency, effectiveness, sufficiency?)

Concern: The most significant trend in the region is perhaps the rapidly growing middle-income class that is striving to adopt the affluent consumption patterns of wealthier people

- While SCP framework has been mostly looking at the supply-side strategies, such as policy option, technological progress, eco-label related product information, close-looped resource efficiency capability, etc.
- In other words, producer as a consumer of resources
APRSCP10 on 11-11-11 @ Jogya
The 10th Asia Pacific Roundtable for Sustainable Consumption and Production (APRSCP)

YOGYAKARTA DECLARATION
ON THE IMPLEMENTATION OF SUSTAINABLE CONSUMPTION AND PRODUCTION IN ASIA AND THE PACIFIC REGION

Yogyakarta, Indonesia, 11 November 2011
SCP in UN CSD 18/19 and Rio+20
APRSCP and International Commitment on SCP

- Green Growth (UN ESCAP)
- Green Economy (UNEP)
- Green Industry (UNIDO)
- Green Job (ILO)
APRSCP and the National Initiatives

China and India
Roundtables and Circular Economy

Japan and Korea
Green Growth and 3R
Strategies focusing on economic growth, not considering social development / environmental stability are more costly – need for more collaborative SCP-based strategies across inter-ministries

- Investments with clear eco-development targets
- Eco-product in response for green procurement
- Capacity building
- Sub-regional cooperation and benchmarking
- Empower indigenous resources – human and materials – leading to strategic and innovative system thinking
• Sustainable Production (SP) is well developed
• Sustainable Consumption (SC) is misunderstood
• Awareness and understanding of SCP* is poor
• Individual good examples exists but systematic approach is lacking
• Lack of integration of government policies is illustrating for the whole problem

*Notion of consumption or SCP enters the picture of CP due to “Rebounce”
UN Rio+20 Summit
SCP Roadmap: Mission Accomplished?
10-Year Framework of Programmes on SCP

Enabling Policy Framework
→ Governments at all levels
- Education & Awareness Raising
- Laws & Regulations
- Investments
- Sustainable Public Procurement
- Fiscal Instruments

Planning and Strategies

Values and Lifestyles

Disposal
Reduce Re-use & Recycle (3Rs)

Life Cycle Perspective

Product Design
Natural Resource Use

Consumption/Use
Distribution/MARKETING

Manufacturing

Market Forces
→ Governments & Major Groups (such as Business & NGOs)
- Pricing / Marketing
- Quality
- Corporate Environmental & Social Responsibility
- Consumer Behaviour & Information
- Sustainable Private Procurement

Energy, Water, Climate, Basic Needs...
Decoupling Scenarios

Decoupling is an ambition but still only a theoretical concept
• No one knows whether sufficient decoupling can actually be achieved within the required time-frame
  - The lock-ins of the existing socio-technical systems
  - The drastic reductions needed (e.g. GHG at least -80%)
  - The urgency (a few decades)

Source:
UNEP
Human Well Being
Economic Activities

Figure 1.

Resource decoupling
Impact decoupling

Time
International Commitment on SCP and Regional Relevance

- **Green Growth** (UNESCAP, 2005) at the MCED5
- **Regional Green Growth Policy Dialogues and Forums**
- **Seoul Initiative on Green Growth Network (SINGG)**
- **Green Economy** (Global Citizen Center UNEP and Partners)

- **Three key elements (TBL)**
  - the Green Economy report, that will provide an overview, analysis and synthesis of how public policy can help markets accelerate the transition towards a green economy;
  - The Economics of Ecosystems and Biodiversity (TEEB), a partnership project focusing on valuation issues;
International Commitment on SCP and Regional Relevance

• Circular Economy

• 3R Platform

• Global Green New Deal (UNEP)

• UNEP/UNESCAP SCP Helpdesk

UNESCAP / UNEP SCP Helpdesk was established in 2006

• To foster innovative practices of sustainable consumption and production in Asia and the Pacific

• Acted as an information hub, co-organized and hosted meetings, and developed specific partnership

Three groups of focus were prioritized:

• Product – performance standard, PSS, integrated product policy, etc.

• Demand side management – education, market, procurement, indicators

• Infrastructure – building and transportation

4/10/2013

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Creating an Enabling Framework

• Green public procurement as the main driver for SCP and green growth
  ‣ Appropriate timing on resource pricing
  ‣ Empower the civil society

• Clear sustainability targets
  ‣ Capacity Building
  ‣ Operationalization of database and clearing house for indigenous technology

• Focus on investments towards Green Economies
  ‣ Subregional cooperation and benchmarking
  ‣ Facilitate a behavioral change of consumption patterns

• More SCP-focused strategies
SCP Push-Pull Scenario

SUPPLY
Eco-design
Green Procurement
Circular Economy
RECP
LCA
Technology Progress
Policy Options

DEMAND
Lifestyle Marketing ads
‘Mesolimbic Dopaminergic Reward System’
Human needs
Human wants
Human desires
Demand-side SCP issues

- Does USE of MANY eco-products lead to sustainability?
- Does USE of MANY recyclables lead to sustainability? What about the energy needed to recycle all these RECYCLABLES in the close-loop circular economy?
- Is there really an ABSOLUTE DECOUPLE of ‘smart’ consumption and ecological impact?
- Why not openly discuss ‘sufficiency’ as minimum need? How about is there a ‘maximum’ human need?
- Is consumer really king? (courtesy of IGES) Where lies the power among value chain actors on consumption?
- Socio-cultural criteria in consumption choice-making seem like missing in the SCP formula?
Green vs Sustainable Consumption

WE HELP THE ENVIRONMENT BY CONSUMING LESS.

WE HELP THE ENVIRONMENT BY CONSUMING LOTS OF ENVIRONMENTALLY SAFE PRODUCTS!
EID System

INDUSTRIAL ECOLOGY

Type I (a) Unlimited resources
Ecosystem Components
Unlimited waste

Type II (b) Energy and limited resources
Ecosystem Components
Limited waste

Type III (c) Energy
Ecosystem Components

(a) Linear materials flows in Type I ecology.
(b) Quasicyclic materials flows in Type II ecology.
(c) Cyclic materials flows in Type III ecology.

Source: Allenby
Science of Sustainability: Cleaner Production to Industrial Ecology to .... SCP?
EID Involvement and Background

- 1998-2002 – UNDP PRIME Project on Industrial Ecology (rooted from Ahmedabad, organized by Suren Erkman, participated by Clarissa Arida)
- 2001 – IEAsia Conference – 90 EID specialists, 22 economies (NA, EU, AP)
Involvement and Background

• 2001 - present – APRSCP, erScp, ISIE, EIEAsia, CEIN, JCP, PIE, JIE, BSE

• 2000 - present : China, Taiwan, Japan, Korea, Thailand, Sri Lanka, Vietnam, Sweden, Denmark, Canada, USA, Finland, Germany, etc.

• Services to: UNEP, UNIDO, InWEnt, APO, Colombo Plan, DANIDA, universities, …. (4 continents, 50+ governments)
Potential Areas of Action Program [Cohen-Rosenthal]

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<thead>
<tr>
<th>Quality of Life/Community Connections</th>
<th>Marketing</th>
<th>Materials</th>
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<tbody>
<tr>
<td>• Integrating Work and Recreation</td>
<td>• Green Labeling</td>
<td>• Common Buying</td>
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<td>• Cooperative education Opportunities</td>
<td>• Accessing Green Markets</td>
<td>• Customer/Supplier Relations</td>
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<td>• Volunteer and Community programs</td>
<td>• Joint Promotions (e.g. advertising, trade shows)</td>
<td>• By-Product Connections</td>
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<td>• Involvement in Regional planning</td>
<td>• Joint Ventures</td>
<td>• Creating New Material Markets</td>
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<td>• Recruiting Value Added Companies</td>
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<tr>
<th>Information/Communications Systems</th>
<th>Transportation</th>
<th>Environment, Health and Safety</th>
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<tr>
<td>• Internal Communications</td>
<td>• Shared Commuting</td>
<td>• Accident Prevention</td>
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<td>• External Information Exchange</td>
<td>• Shared Shipping</td>
<td>• Emergency Response</td>
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<td>Monitoring Systems</td>
<td>• Common Vehicle Maintenance</td>
<td>• Waste Minimization</td>
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<td>• Computer Compatibility</td>
<td>• Alternative Packaging</td>
<td>• Multi-media Planning</td>
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<td>• Joint Management Information System for Park Management</td>
<td>• Intra-Park Transportation</td>
<td>• Design for Environment</td>
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<td>• Integrated Logistics</td>
<td>• Shared Environmental Information Systems Joint Regulatory Committee</td>
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<tr>
<th>Production Process</th>
<th>Human Resources</th>
<th>Energy</th>
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<tr>
<td>• Pollution Prevention</td>
<td>• Human Resources Recruiting Joint Benefit Packages</td>
<td>• Green Buildings</td>
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<tr>
<td>• Scrap Reduction and Re-use</td>
<td>• Wellness Programs</td>
<td>• Energy Auditing</td>
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<tr>
<td>• Production Design</td>
<td>• Common Needs (payroll, maintenance, security)</td>
<td>• Cogeneration</td>
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<tr>
<td>• Common Subcontractors</td>
<td>• Training</td>
<td>• Spin-off Energy Firms</td>
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<tr>
<td>• Common Equipment</td>
<td>• Integrated Logistics</td>
<td>• Alternative Fuels</td>
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<td>• Technology Sharing Integration</td>
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EID Components

[Chiu] (Scale ... Temporal, geographical, human factors)

- **Primary (Hardware): Interaction - Industrial Metabolism**

- **Supportive (Software): Inter-relationship among the elements in the industrial system**
EID Component 1

• Primary (Hardware): Interaction - Industrial Metabolism
  • Energy and material flow (physical accountability)
  • System Design: Product, process, and service (determinants) [e.g. micro-forest design at Burnside for the social benefits vs. ISO14001-certified reservoir design] [e.g. Factor X, green planning and architecture, transportation system, ecosystem restoration, etc.]
  • information management (catalyst)
Primary Component

- Energy use
- Renewable energy?

  - Water use
    - Waterless operation design
    - Water recycle / reuse
    - Water harvest via catchments or pipe net

  - Material use
    - CP mgt & technology (LHF)

  - Information flow
    - Technical information for industrial symbiosis to take off

[can refer to Cohen Rosendal’s nine categories as well]
Primary Component

- Estate-level Facilities and Services
  - Infrastructure Design
    - Landscape
    - Sun and wind pattern design
  - Transportation Design
- By product chain
- Resource Recovery
  - Regional hub functionality
  - Value-added approach
  - Co-valued approach
  - Value-downgraded approach
EID Component 2

- Supportive (Software): Inter-relationship among the elements in the industrial system
  - Stakeholders participation (government, citizen, NGO, academe, researchers, etc.) – network concept, political will, policies, management, participatory process, PPP ...
  - Quality of life, consumer education, capacity development
Supportive Component

Audited planning
Urban and rural plans
- Health, economic, and environment planners
- Current economic sector structure
- Strong R&D
  - Priority items
  - Urgent items (e.g. energy substitute ... agri subs)
- Stakeholder education
  - Information exchange and education for consumerism

Policy
- Universal guidelines and local enforcement
- Autonomy

Finance
- Incentives, tax holiday

Management structure
- Single entity, e.g. programmatic EIA, IEAT model
- Business incubation
- EIP management style
- Capacity building

A significant component if the IEAsia 7 issues were revisited
the conclusion of the Conference came out with seven concerned issues:

1. Terminology (indicator/reporting)
2. Communications
3. Policies
4. Financing
5. Research and Development
6. Management Structure
7. Future of EID

Source: Chiu JIE 5:2
Eco-Industrial Initiatives Worldwide

Source: Updated by Anthony SF Chiu on June 15, 2005
## Selected EIP Initiatives in Asia Pacific

<table>
<thead>
<tr>
<th>Asian economies (source reference)</th>
<th>Some participating agencies</th>
<th>Location of some EIP initiatives (updated June 22, 2004)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia (3,4)</td>
<td>Western Australian Water Corp., University of Canberra</td>
<td>Shenton Sustainability Park, Synergy Park Brisbane, Gladstone, Projects involved by Curtin University Cleaner Production Program and Australian BCSD.(Kwinana)</td>
</tr>
<tr>
<td>China (1)</td>
<td>SEPA, UNEP, Dalian Univ of Tech, Tsinghua Univ IE Team, EU, Dalhousie, Indigo, GTZ</td>
<td>Dalian, Yantai, Soo Chow, Tianjin, Guiging, Yixing, Taihu, Shanghai, Chong Yuan, Guiyang and Jiansu, Shi Hezi, Guigang, Nanhai, Quzhou, Zaozhuang, Labei</td>
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<tr>
<td>Philippines (1,2)</td>
<td>UNDP PRIME and EPIC projects, Yale University, USAEP</td>
<td>Laguna International Industrial Park, Light Industry and Science Park, Carmelray Industrial Park, LIMA, Laguna Technopark, Philippine National Oil Company Petrochem Industrial Park, Clean City Center project (USAID). GTZ project with PEZA &amp; EPIC.</td>
</tr>
<tr>
<td>Indonesia (1)</td>
<td>Kaiserslautern University, GTZ</td>
<td>Lingkungan (LIK), Tangerang; Semarang; Industri Sona Maris</td>
</tr>
<tr>
<td>India (1)</td>
<td>Kaiserslautern University, ICAST, Technology Exchange Network</td>
<td>Naroda; Tirupur Textile sector; Tamil Nadu tanneries; Calcutta foundries; Tamil Nadu paper/sugar; Bangalore water project; Ankleshwar, Nandeseri, Thane-Belapur.</td>
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<tr>
<td>Malaysia (1)</td>
<td>USAEP</td>
<td>LHT resources linkage.</td>
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<tr>
<td>Japan (1,2)</td>
<td>UNEP, Tokyo - Osaka - Toyo Univ, Japanese government</td>
<td>19 eco-towns (e.g. Kawasaki, Kitakyushu, Itabashi), Fujisawa, Toyota city.</td>
</tr>
<tr>
<td>Korea (3)</td>
<td>NCPC Korea</td>
<td>15 year 3-phase Master EIP Plan launched in 2003. Six proposals submitted. (Banwol Siwha, Mipo Onsan, Yeosu, Chungju, Jinhae Haman Jinju, and Pohang)</td>
</tr>
<tr>
<td>Vietnam (1)</td>
<td>Amata developer, USAEP, University of Natural Sciences</td>
<td>Amata (environment management), Hanoi Sai Dong II (feasibility study).</td>
</tr>
<tr>
<td>Thailand (1)</td>
<td>GTZ, IEAT</td>
<td>Industrial Estate Authority of Thailand plans (Map Ta Phut, northern region, Amata Nakorn, eastern sea-board, Bang Poo); Samut Prakarn province CPIE project (ADB-funded); Bangkok (Panapanaan).</td>
</tr>
<tr>
<td>Singapore (2,4)</td>
<td>JTC developer, National University of Singapore</td>
<td>Jurong Island Industrial Park</td>
</tr>
<tr>
<td>Sri Lanka (1)</td>
<td>Ministry of Economic and Industrial Development</td>
<td>ADB supported major policy studies in 2002</td>
</tr>
</tbody>
</table>

Sources: (1) IEAsia Conference 2001 (2) EIEAsia Conference 2004 (3) JCP Special Issue on IE (4) personal contacts
Developmental Stages Model

- **East Asia and Oceania (China, Japan, Korea, Taiwan, Australia)**
  - Layout of macro- and IRMP-oriented policy
  - Sustainable technology or EST development
- **South and Southeast Asia (Philippines, Thailand, Singapore, Vietnam, India, Sri Lanka, Indonesia)**
  - Initial EID elements on no-cost and low-cost programs
  - Evolution from firm-level to park-level programs
- **Inland Asia and others**
  - Premature to EID awareness
Continuum Stages Model of EIP Development in Southeast Asia

Source: Chiu, 2001
## Description of the Continuum Model

<table>
<thead>
<tr>
<th>Stages</th>
<th>Internal Neutral</th>
<th>Internal Supportive</th>
<th>External Neutral</th>
<th>External Supportive</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Industry-level Optimization</td>
<td>Tenant Business Partner Network</td>
<td>Estate-level Optimization</td>
<td>Estate as asset to neighboring entities</td>
</tr>
<tr>
<td>Description</td>
<td>Minimizes individual industry environmental impact</td>
<td>Takes on supportive role on business partners’ environmental performance within the industrial estate system</td>
<td>Minimizes environmental impact at estate level</td>
<td>Provides environmental services as competitive edge to regional network (e.g. neighboring estates, stand alone industries, communities)</td>
</tr>
<tr>
<td>Environmental impact of individual tenant (unit)</td>
<td>(0)</td>
<td>(+)</td>
<td>(++)</td>
<td>(+++)</td>
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<tr>
<td>Environmental impact of industrial estate (system)</td>
<td>(-)</td>
<td>(-)</td>
<td>(0)</td>
<td>(+)</td>
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<tr>
<td>Economic performance of system</td>
<td>(+)</td>
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<td>(+++</td>
<td>(++++)</td>
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<tr>
<td>Social image of system</td>
<td>(-)</td>
<td>(-)</td>
<td>(0)</td>
<td>(+)</td>
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<tr>
<td>Programs</td>
<td>Cleaner Production (CP)</td>
<td>Corporate Synergy System (CSSII)</td>
<td>Extended Product Responsibilities (EPR)</td>
<td>Integrated Resource Recovery System</td>
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<td>Environmental Management System (EMS)</td>
<td>Green Procurement</td>
<td>Product Stewardship</td>
<td>Regional Resource Management</td>
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<td>Ecodesign</td>
<td>Eco-labeling</td>
<td>Material and Water Recycling</td>
<td>Life Cycle Assessment (LCA)</td>
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<td>Life Cycle Assessment (LCA)</td>
<td>Programmatic Cleaner Production (P-CP)</td>
<td>Energy Cascading</td>
<td>Substance Flow Accounting (SFA)</td>
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<td>Environmental Management Accounting (EMA)</td>
<td>Programmatic Environmental Impact Assessment (P-EIA)</td>
<td>Co-generation</td>
<td>Material Flow Accounting (MFA)</td>
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<td>Environmental Performance Indicator (EPI)</td>
<td>By Product Exchange (BPX)</td>
<td>Collective Utility Sharing of transport, warehousing logistics, training, recruitment, marketing, procurement</td>
<td>National Policy on Circular Economy</td>
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<td></td>
<td>Corporate Social Responsibility (CSR)</td>
<td>Packaging material take back</td>
<td>Green architecture</td>
<td>Intra- and Inter-estate Collaboration</td>
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<td>Design for Environment (DfE)</td>
<td>Landscape Ecology</td>
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<td>Reverse Manufacturing / End of life Disassembly</td>
<td>Centralized WWTF (see Kalundborg Box)</td>
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<td>Cross Industry By product Exchange (BPX)</td>
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<td>Emergency Response System</td>
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<td>Park Environmental Management</td>
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Note: (0) means neutral, no positive or negative contribution to the parameter

(+): means positive (good) impact on the environment or good social image

(-): means negative (bad) impact on the environment
System Thinking

Objectives:

- to MAXimize output with MINimum input, and operating within the carrying capacity of the eco-system
- Human well-being and social equity
- Environmental risks and ecological scarcities

Conservation of Resources

Resource Efficiency

Products & Services

Conservation of Resources

Resource Efficiency
Hoi An city PC’s strategic vision of eco city

**HOI AN RESIDENTS AND COMMERCIAL ESTABLISHMENTS**

**RESOURCES INPUT**

1M TOURISTS

**PRODUCT SERVICES**

= GDP + ENVI + HAPPINES

Minimum non-product
Green Industry Opportunities

3R services and management to wastewater, solid waste

1M TOURISTS

- HOTELS
- RESTAURANTS
- BOATS
- TOUR OPERATOR
- RESIDENT & COM’L
- VEGETABLE VILLAGE
- CRAFT
- BUSES
- CERAMIC VILLAGE

Utilities: clean water, clean energy, etc.
The Basic MFA Model

Source: WRI et al., 2000; Rapera, Corazon
INDICATORS

INPUT

Total Material Requirement (TMR)

- Direct Material Input (DMI) = Domestic Extraction (DE) + imports
- Domestic Hidden Flows (DHF)
- Foreign Hidden Flows (FHF)

OUTPUT

- Domestic Processed Output (DPO)
- Total Domestic Output (TDO) = Domestic Processed Output (DPO) + DHF
- Direct Material Output (DMO)
- Total Material Output (TMO)

BALANCE

- Net Addition to Stocks (NAS) = DMI + Air and Water – Exports – DPO – Water Vapour
- Imports and Exports
- Air, Water, Water Vapour
MFA Components

**Domestic**
- Non-Renewable
  - Energy Carriers
  - Metal Ores
  - Industrial Minerals
  - Construction Materials
  - Excavation
- Renewable
  - Plant Biomass
  - Animal Biomass
- Soil Erosion

**Imports**
- Non-Renewable
  - Energy Carriers
  - Metal Ores
  - Industrial Minerals
  - Construction Materials
  - Excavation
- Renewable
  - Plant Biomass
  - Animal Biomass
- Semi-Manufactures
- Final Products
- Hidden Flows
  - Imported Raw Materials
  - Imported Semi-Manufactures
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Resource Utilization

Philippine DMI and GDP

- Domestic Material Input (metric tons)
- GDP (million pesos, at constant 2000 prices)