Tailoring EW-MFA (Economy-Wide Material Flow Accounting/Analysis) **information and indicators to developing Asia:**

increasing research capacity and stimulating policy demand for resource productivity

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Introduction

Sustainable resource management is becoming a policy concern

- Resource scarcity, resource price fluctuation
- for Both developed and developing countries.
- Resource circulation(3R), Resource productivity (RP)

Asian developing countries:
Rapid industrialisation / emerging ecnomies
Benefit from monitoring Material Flow data

- rely heavily on imports of raw materials and exports of manufactured goods

- Few countries in Asia
- If they apply EW-MFA for policy development, it would contribute to improving global resource productivity

Would like to
Enhance capacity of developing Asia to utilise EW-MFA indicators for policy development

Analysing economic & social driver to utilise EW-MFA / Resource productivity indicator for policy in G8 and OECD countries

Brief assessment of the national capacity for MFA in selected developing countries

New Project: "Stimulating policy demand for indicators on sustainable resource use and resource productivity and strengthening research capacity for Economy-Wide Material Flow Analysis in Asia"

Analysing economic & social driver to utilise EW-MFA / Resource productivity indicator for policy (2007-08)

- Analysed policy application of EW-MFA in G8 and Selected OECD countries
- Assessed Activeness in Policy application of EW-MFA by the following points

Implementation	Focuses	National target
Conducts EW-MFA at • **Whole country/national level** • **On Regular basis** • **Under the initiative of governments**	• Sustainability and **Efficiency** of **resource-use**, • Environmental **impacts** due to **material use** • **Sustainability** of **waste management**	the setting of • **national target** • **time boundary to achieve the target**

Methodology
• Policy application of EW-MFA : Literature survey based on a report of OECD (2007) with a combination of on-line data surveys officially available from governmental websites
• Comparative analysis on Policy application of EW-MFA and its relations with economic characteristics

• About Position and perception of EW-MFA Indicators in G8 governmental policies:On-line data surveys officially available from governmental websites and Interview survey with a combination of questionnaire to
   • the governmental officials of ministries in charge of 3R-related policies or statistics office
   • research institutes in charge of development of MFA indicators

Analysing economic & social driver to utilise EW-MFA / Resource productivity indicator for policy (2007-08)

- Countries with (a) large trade deficit for natural resources and (b) large exporting-oriented manufacturing sector

  – Active in integration of EW-MFA into governmental policy development
  – Strong incentives to manage natural resources efficiently
  – Especially **Germany, Italy** and **Japan** have time boundary target setting.

Policy application of economy–wide MFA	Resource import surplus (billion US$)			Manufactured goods export surplus (billion US$)			Manufacturing (% of GDP, year 2006)		
	Below 0	0 to 50	More than 50	Below 0	0 to 25	More than 25	Below 14	15 to	More than 20
Active		•Austria •UK •Finland	•Japan •Germany •Italy	•UK	•Finland •Austria	•Germany •Japan •Italy	•UK	•Italy •Austria	•Germany •Japan •Finland
		•Belgium		•Belgium				•Belgium	
Less Active	•Denmark •Norway •Australia •Canada •Russia	•Netherlands •Sweden	•US •France	•France •Denmark •Sweden •Norway •Canada •Russia •Australia •US	•Netherlands		•US •Denmark •Netherlands •France •Australia •Norway	•Russia	•Sweden

trade of ore, metals and fuels (UNCTAD Handbook of statistics 2007)

Chemical products, machinery and transport equipment and other manufactured goods (UNCTAD Handbook of statistics 2007)

World Development indicator 2008

Indicators and target setting of resource productivity in G8 countries

(2007-08)

> **MFA indicator and national target**
>
> - EU countries has developed MFA indicator as National Sustainable Development indicator, but only Italy and Germany as target to achieve.
>
> - US and Canada no plan to calculate MF indicator and set target.
>
> - Japan practically uses MF indicators for policy development on 3R.

	UK	Italy	Germany	France	EC	Canada	US	Japan
MFA indicator	DMC	TMR	Raw Material Productivity= GDP/(DMI-biomass)	DMC	DMC			• Resource Productivity = (GDP/Natural resources etc.) • Cyclical Use Rate • Final Disposal Amount
Its position in national policy	Sustainable Development Indicator	National Strategy for Sustainable Development	National Strategy for Sustainable Development / German Environment Barometer	National Sustainable Development Indicator <u>by IFEN</u> (planned: TMC, TMR)	Sustainable Development Indicator			Basic Plan for Establishing the Sound Material Cycle Based Society
Target	No	90% reduction of TMR in 2050	Double RMP by 2020	No	No	No	No	• Year 2015 • RP:420,000JPY(5,000US$)/t • Cyclical Use Rate: 14-5% • Final Disposal Amount: 23Mt

Indicators and target setting of resource productivity in G8 countries

(2007-08)

> *Opinion to National / International Common Target Setting*
>
> - Japan and EC are positive to policy binding goal setting in national target
>
> - Some countries are against to set international common target setting
>
> - But, many countries are positive to develop international common indicator
>
>   – Most countries agree, "at least at the expert level", on the effectiveness of MFA for resource management policy.

○:positive, △:in-between, × :not positive

	UK	Italy	Germany	France	EC	Canada	US	Japan
	△	△	△	×	△∼○	×	×∼△	○
Opinion to national target	Useful but not be set on the basis of MFA	**Not** regarded as the **implementation target** of government	**Not** considered as **goal setting,** but rather an indicator for making synergies among different policy areas	No strong emphasis on material use	Energy efficiency is more important, but likely set resource productivity targets in future	Difficult to set explicit national targets due to powerful local governments	Focus on particular material flows of concern, effectiveness of an aggregated indicator is not clear	Utilise indicator & target for policy assessment on Basic Plan for Establishing the Sound Material Cycle Based Society
Common target setting	×	△	○	×	△	×	×	○
Common indicator development	○	○	○	△	△	×	○	○

Indicators and target setting of resource productivity in G8 countries

- Significantly influenced by the difference in **Industrial and Economic structure** as well as **political systems (**federal or central government**)**.

Industrial and Economic structure	Political system

• Economies with **relatively large manufacturing industrial sector** are interested
 	
  - Reduction of materials input
  - **the economies' dependence on resource extracted** in other countries.
	• Especially the **relationship between central and local governments** influences
	
	  - Data collection
	  - Possibility to set national target indicator

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Assessment on the national capacity for EW-MFA in selected developing countries (2007)

- All countries surveyed seem to have most of the basic input and output related statistics available.
- Some countries seem to have sufficient data to estimate their DMI and DMC.
- The availability of MFA data in some countries surveyed is not much different from in some OECD countries.

Table: Overview of the main findings of the study

	input data			Output data		Sector data			Use in Public Policy		SFA	
	All	Some	Few	All	Some	Some	No	Unknown	Yes	No	Yes	No
Brazil		○		●		○			●		●	
China		○					●		●		●	
India	●			●		○			●		●	
Indonesia			●		○		●			●		●
Malaysia		○		●				○		●	●	
Philippines	●			●				○	●		●	
Russia		○		●		○			●		●	
Singapore	●				○		●			●		●
Thailand	●			●		○			●		●	
VietNam			●	●		○				●	●	

Methodology
Questionnaire survey to related Ministry, Statistical office, University, Research Institute and Others

Assessment on the national capacity for EW-MFA in selected developing countries (2007)

- A **large number of organisations**, including governmental bodies and academia, are already **collecting statistics relevant to MFA**,

- HOWEVER, **data collection is fragmented**
  - split up among many governmental bodies and research institutes.

- There is a **lack of coordination**
  - difficult to get an overview of existing data, and

- Limited awareness among policy makers on the potential benefits of MFA

④ Low awareness of and perceived need for MFA

① Limited efforts to collect data systematically and to co-ordinate MFA activities

Vicious Circle

② Low capacity for MFA

③ Difficult to generate visible results and to show benefits of MFA

Figure: The vicious circle of low capacity for MFA studies and low utilisation of MFA in policy making

How can we break the vicious circle…

For capacity development in Asia - recommendation

- Establishment of national focal points for **coordination of MFA data collection and compilation** → ①②

- **Training and capacity development** to harmonise data definitions and documentation formats→②

- Development of case studies **illustrating how MFA has provided policy makers with an improved basis for policy design** →③④
    - Promote interaction between analysts/experts and policy makers on good practices

- **International collaborative research projects** to further develop the capacity of Asian countries (governments, academia and research institutes) to complete and analyse MFA data → ①②③④

④ Low awareness of and perceived need for MFA

③ Difficult to generate visible results and to show benefits of MFA

Vicious Circle

① Limited efforts to collect data systematically and to co-ordinate MFA activities

② Low capacity for MFA

Figure: The vicious circle of low capacity for MFA studies and low utilisation of MFA in policy making

A Project Proposal *- "Stimulating policy demand for indicators on sustainable resource use and resource productivity and strengthening research capacity for Economy-Wide Material Flow Analysis in Asia"*

1. Deepen the Assessment of the existing capacity for EW-MFA, and for the use of MF indicators for policy making

2. Identify the potential benefits of MF indicators in policy processes of developing Asian countries
   - Analysing **Economic & social driver** for Asian countries to **effectively utilise EW-MFA** for 3R, Economy, Resource productivity and decoupling policy

3. Explore Effective ways to upgrade capacity for systematic and regular EW-MFA activities in developing Asia

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┌─────────────────────────┐         ┌─────────────────────────┐
│ Work 1 :                │         │ Work 2:                 │
│ Assessing existing EW-  │         │ Identify the potential  │
│ MFA capacity            │         │ benefits of MF          │
│                         │         │ indicators for Asian    │
│                         │         │ countries               │
└────────────┬────────────┘         └────────────┬────────────┘
             └──────────────┬────────────────────┘
                ┌───────────┴──────────────────┐
                │ Work 3: Explore Effective     │
                │ ways to upgrade capacity      │
                └──────────────────────────────┘
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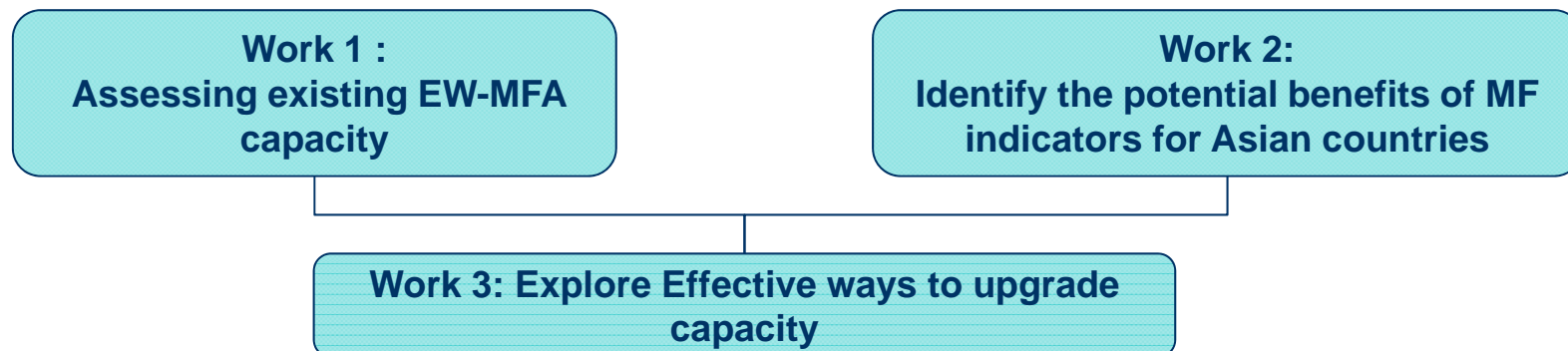
Work 1 : Assessing existing EW-MFA capacity

- **Data availability** of MF related statistics
  - Availability & Consistency with international data
  - Sectral data
  - By Exploring existing national statistics and international statistics as complement
  - Collectors of data

- **Institutional Capacity**
  - Institutional arrangement of **organizations which collect** MF related environmental information/statistics or
  - Existence of **organization which coordinate** (environmental) information/statistics collected by several different organization in the country, and
  - Previous/existing **applications of MF related indicators to policy** making
  - **Awareness/needs** on the effectiveness EW-MFA for 3R/decoupling/ RP policies among stakeholders
    - Government (ministries and national institutes), Industry associations, others

Work 2: Identify the potential benefits of MF indicators

- Economic & social driver to effectively utilise EW-MFA for 3R, Resource productivity and decoupling policy

- **Economical structure and the development status**
  - Poverty, large informal economy,
  - Transition agrarian to industrial economies,
  - High density developing economies
  - Exporters of large amounts of products to developed countries.
  - High dependency on biomass resources
  - Large investments in building up their infrastructure

> • **Population, Population density,**
> • **GDP, GDP/capita,**
> • **Trade (metal, energy, manufactured goods etc..),**
> • **Economic structure(sector contribution to GDP),**
> • **Sectoral Investments,**
> • **Other data**

- **Waste Composition**
  - Organic waste is major components in Asia
  - Potential of material resource cycle

- **Institutional and political system**
  - Countries' administrative structure
  - Role of local government to national statistical system
    - impact the availability of nation-wide MFA data.

Work 3: Explore Effective ways to upgrade capacity

- **Formulating <u>roadmap to establish</u> systematic and regular implementation of <u>EW-MFA</u> and Resource Productivity analysis.**

  - <u>**Drawing experiences in OECD countries**</u> for developing adapted MFA tools.

  - <u>**Expected institutional arrangements**</u> for EW-MFA data collection, MF analysis and policy-making,
  - Role-sharing and collaboration among the organisations involved

  - Ways to **<u>strengthen the availability of MF data</u>**
  - Identifying challenges to develop sectral data & internationally consistent statistic format

  - Identifying **<u>policy domains and users</u>** (ministries, etc.) that may be informed by EW-MFA

  - Developing **<u>effective package of EW-MF indicators</u>** for policy use that reflect the situation in developing Asia to achieve sustainable resource use.

Thank you!

Any recommendation, suggestion and comments are welcomed!

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iGES Institute for Global Environmental Strategies

Needs for indicators for international hidden flow / environmental burden shifting of resource use

- **As a MFA-indicator, TMR is an indicator to reflect hidden flow associated with domestic material extraction and imports.**

- **The countries with relatively large manufacturing sector have more policy interest over dependence on materials import and associated impact from resource extraction**

UK	Italy	Germany	France	EC	Canada	US	Japan
△	○	○	△	△	×	△	○
interested in environmental burden shifting of resource use	necessary to show foreign constrains of resource use	Raw Material Productivity does not reflect biomass, so alternative indicator is considered.	indirect and foreign flows are considered important at the level of experts (IFEN)	Prefers indicators reflecting environmental burden such as ecological foot print	no plan to calculate because of difficulties to make consensus on methodologies and data to use.	interested in methodological development	planning to apply TMR to quantify environmental impacts at global level

IGES Institute for Global Environmental Strategies

Linking MFA and environmental impact

- **EU emphasized the significance of environmental impact indicator for harmonization of development and environmental conservation.**

UK	Italy	Germany	France	EC	Canada	US	Japan
△	×	N.A.	△	○	×	△	△
-Interesting step -Methodology development is necessary	not favor (ISTAT)	One of alternative indicators to be compared for the next step	strong interest in the development of an MFA-base environmental indicator (IFEN)	would like to introduce EMC (environmentally-weighted material consumption)	no plan to caluculate	not opposing to working together for methodology development	The development of inventories in each country related to calculation of environmental impact and setting conversion factors to be shared internationally

a3

Resource **productivity indicator based on MFA is better served to show win-win solution between resource conservation and industrial competitiveness.**

Need careful assessment for the integration of environmental impact into MFA

a3 (need to ask hotta-san he context of this sentence)
aoki, 2010/10/28