

Physical flow accounting

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Outline

- Learning objectives
- Review of basics (10 min.)
- Level 1 What? Why? (compilers)
 - Concepts (25 min.)
 - Group exercise and discussion (30 min.)
- Level 2
 - Concepts (15 min)
 - Group discussion (10 min.)

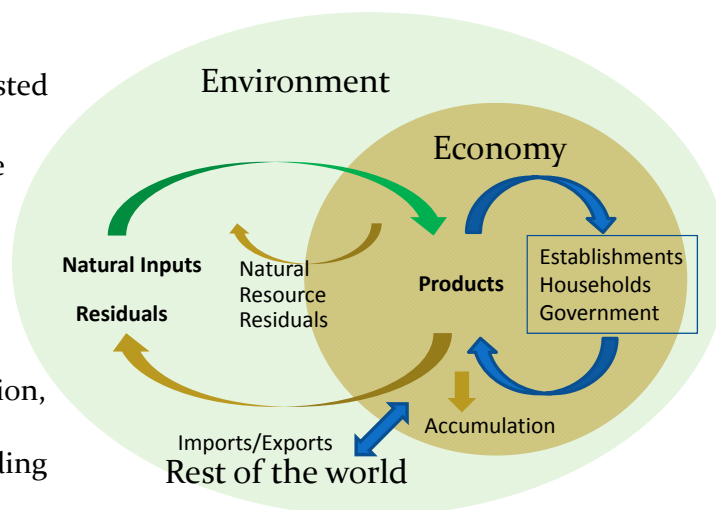


Learning objectives

- Level 1
 - Understand what Physical Flow are and why they are important
 - Understand the basic concepts
 - Understand how treated in the SEEA
 - Learn the steps of compiling
- Level 2
 - Understand further concepts required
 - Learn about data sources and measurement challenges

What is physical flow accounting?

Natural inputs are extracted and harvested to create **Products**, which are consumed, accumulated and discarded, in the process creating **Residuals** as by-products of production, consumption and accumulation including **Natural resource residuals** (unused natural inputs)



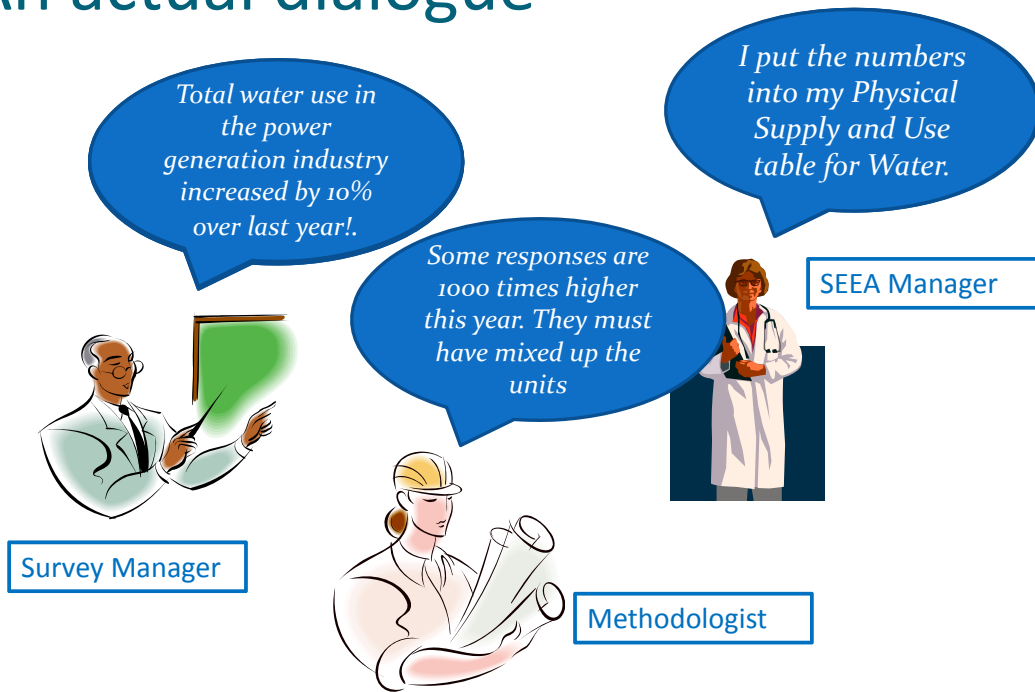
Physical flows in the SEEA

- Natural inputs
 - Economy-wide material flows (aggregate tonnes)
 - Energy
 - Water
- Residuals
 - Air emissions
 - Effluents (wastewater)
 - Solid waste
- Linked to Asset Accounts (Stock +/-changes in stock)
 - Minerals & Energy
 - Water
 - Land, Soil
 - Timber, Aquatic Resources, Other Biological Resources

Accounts “balance the books”

- Source statistics, e.g.:
 - Water abstracted by municipal water supply
 - Water used for irrigation
- come from different sources & use different:
- Methods, concepts and classifications
 - Units of measure
 - Accounting periods
- Accounts harmonize, integrate and improve source statistics
 - Can be used to show and estimate data gaps

An actual dialogue



Uses of physical flow accounts

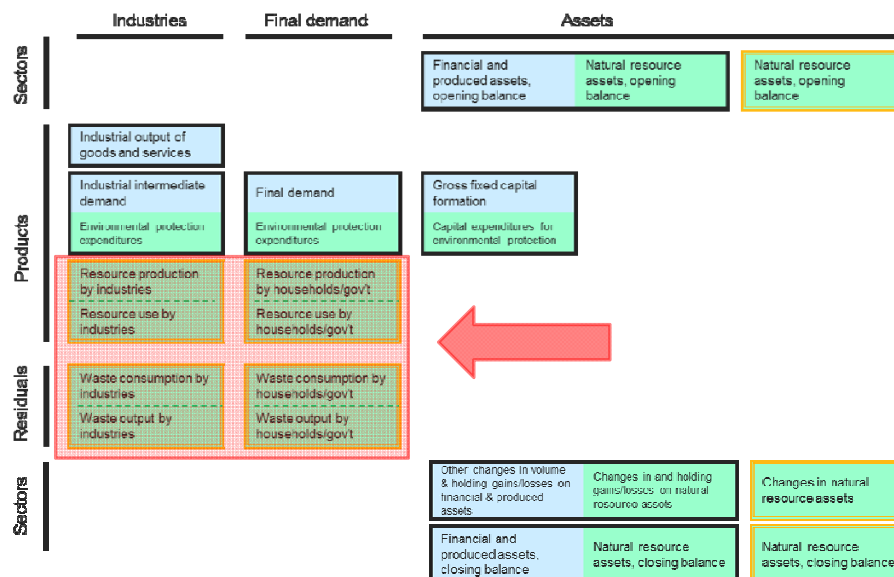
- Natural inputs
 - Sustainable consumption and production
 - Natural resource management (minerals, energy, water, food, timber)
 - Footprint calculations
- Energy
 - Analyse use and distribution
- Water
 - Analyse supply/use, distribution
- Residuals
 - Analyse air emissions, wastewater, solid waste
 - Total quantities, main sources



Basic concepts

- Physical flow accounting
- Physical supply and use tables
- The supply/use chain
- Accounting identities
- Definitions
 - Natural Inputs
 - Products
 - Residuals

Physical flows in the SEEA



Physical supply table

If households extract materials, they are “producers”

Environment

Rest of the world

Domestic production, consumption and accumulation

Supply table

	Production; generation of residuals		Accumulation			Total
	Production; generation of residuals by industries (including household production on own account), classified by ISIC	Generation of residuals by households	Industries —classified by ISIC	Flows from the rest of the world	Flows from the environment	
Natural inputs					A. Flows from the environment (including natural resource residuals)	Total supply of natural inputs (TSNI)
Products	C. Output (including sale of recycled and reused products)			D. Imports of products		Total supply of products (TSP)
Residuals	I1. Residuals generated by industry (including natural resource residuals) I2. Residuals generated following treatment	J. Residuals generated by household final consumption	K1. Residuals from scrapping and demolition of produced assets K2. Emissions from controlled landfill sites	L. Residuals received from rest of the world	M. Residuals recovered from the environment	Total supply of residuals (TSR)
Total supply						

SEEA-CF Table 3.1

Physical use table

Government final consumption is recorded as intermediate consumption

Environment

Rest of the world

Domestic production, consumption and accumulation

Use table

	Intermediate consumption of products; use of natural inputs; collection of residuals	Final consumption*	Accumulation			Total
	Industries —classified by ISIC	Households	Industries —classified by ISIC	Flows to the rest of the world	Flows to the environment	
Natural inputs	B. Extraction of natural inputs B1. Extraction used in production B2. Natural resource residuals					Total use of natural inputs (TUNI)
Products	E. Intermediate consumption (including purchase of recycled and reused products)	F. Household final consumption (including purchase of recycled and reused products)	G. Gross capital formation (including fixed assets and inventories)	H. Exports of products		Total use of products (TUP)
Residuals	N. Collection and treatment of residuals (excluding accumulation in controlled landfill sites)		O. Accumulation of waste in controlled landfill sites	P. Residuals sent to the rest of the world	Q. Residual flows to the environment Q1. Direct from industry and households (including natural resource residuals and landfill emissions) Q2. Following treatment	Total use of residuals (TUR)
Total use						

SEEA-CF Table 3.1

The supply/use chain

Natural inputs supplied by environment → used by production

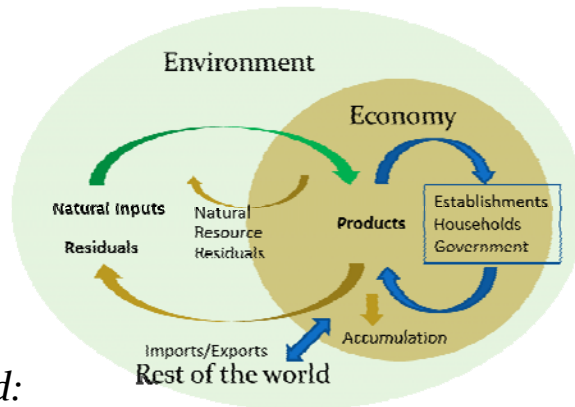
Products supplied by (production and imports) → used by intermediate consumption, households, accumulation and exports

Residuals supplied (created) by all → used by collection & treatment, accumulation, export and environment

Table 3.1
General physical supply and use table

		Production/generation of residuals			Accumulation					
		Production/generation of residuals by industries (including household production on own accounts), classified by ISIC	Generation of residuals by households	Industries—classified by ISIC	Flows from the rest of the world	Flows from the environment	Total			
Supply table										
Natural inputs						A. Flows from the environment (including natural resource residuals)	Total supply of natural inputs (TSNI)			
Products	C. Output (including sale of recycled and reused products)				D. Imports of products		Total supply of products (TSP)			
Residuals	I1. Residuals generated by industry (including natural resource residuals) I2. Residuals generated following treatment	J. Residuals generated by household final consumption	K1. Residuals from scraping and dismantling of scrapped assets K2. Emissions from controlled landfill sites	L. Residuals received from rest of the world	M. Residuals recovered from the environment		Total supply of residuals (TSR)			
Total supply										
Use table		Intermediate consumption of products; use of natural inputs; collection of residuals			Final consumption			Accumulation		
		Industries—classified by ISIC			Households	Industries—classified by ISIC	Flows to the rest of the world	Flows to the environment	Total	
Natural inputs	B. Extraction of natural inputs B1. Extraction used in production B2. Natural resource residuals							Total use of natural inputs (TUNI)		
Products	E. Intermediate consumption (including purchase of recycled and reused products)	F. Household final consumption (including purchase of recycled and reused products)	G. Gross capital formation (including fixed assets and inventories)	H. Exports of products						
Residuals	N. Collection and treatment of residuals (excluding accumulation in controlled landfill sites)				O. Accumulation of waste in controlled landfill sites	P. Residuals sent to the rest of the world	Q. Residual flow to the environment	Total use of residuals (TUR)		
Total use										
									Q1. Direct from industry and households (including natural resource residuals and landfill emissions) Q2. Following treatment	

Accounting identities



Input-output identity

- Over an accounting period:
flows of materials **into** an economy must equal flows of materials **out** of an economy plus any **net additions** to stock in the economy

Accounting identities

Supply and use identity (double entry accounting)

- Total **Supply** (including imports) = Total **Use** (including exports)

Total Supply of	= Total Use of
Natural Resource Inputs	= Natural Resource Inputs
Products	= Products
Residuals	= Residuals

Definitions: Natural inputs

3.45 *Natural inputs are all physical inputs that are **moved** from their location in the environment as a part of economic production processes or are **directly used** in production.*

Table 3.2
Classes of natural inputs

1	Natural resource inputs
1.1	Extraction used in production
1.1.1	Mineral and energy resources
1.1.1.1	Oil resources
1.1.1.2	Natural gas resources
1.1.1.3	Coal and peat resources
1.1.1.4	Non-metallic mineral resources (excluding coal and peat resources)
1.1.1.5	Metallic mineral resources
1.1.2	Soil resources (excavated)
1.1.3	Natural timber resources
1.1.4	Natural aquatic resources
1.1.5	Other natural biological resources (excluding timber and aquatic resources)
1.1.6	Water resources
1.1.6.1	Surface water
1.1.6.2	Groundwater
1.1.6.3	Soil water
1.2	Natural resource residuals

2 Inputs of energy from renewable sources

2.1	Solar
2.2	Hydro
2.3	Wind
2.4	Wave and tidal
2.5	Geothermal
2.6	Other electricity and heat
3	Other natural inputs
3.1	Inputs from soil
3.1.1	Soil nutrients
3.1.2	Soil carbon
3.1.3	Other inputs from soil
3.2	Inputs from air
3.2.1	Nitrogen
3.2.2	Oxygen
3.2.3	Carbon dioxide
3.2.4	Other inputs from air
3.3	Other natural inputs n.e.c.

Definitions: Products

3.64 Following the SNA, products are **goods and services** that result from a process of production in the economy.

CPC Ver. 2
(Central Product Classification, Ver. 2)

Click on any code to see more detail. Click [here](#) for top level only.

- 0 - Agriculture, forestry and fishery products
 - 01 - Products of agriculture, horticulture and market gardening
 - 02 - Live animals and animal products (excluding meat)
 - 03 - Forestry and logging products
 - 04 - Fish and other fishing products
- 1 - Ores and minerals; electricity, gas and water
 - 11 - Coal and lignite; peat
 - 12 - Crude petroleum and natural gas
 - 13 - Uranium and thorium ores and concentrates
 - 14 - Metal ores
 - 15 - Stone, sand and clay
 - 16 - Other minerals
 - 17 - Electricity, town gas, steam and hot water
 - 18 - Natural water
- 2 - Food products, beverages and tobacco; textiles, apparel and leather products
 - 21 - Meat, fish, fruit, vegetables, oils and fats
 - 22 - Dairy products and egg products
 - 23 - Grain mill products, starches and starch products; other food products
 - 24 - Beverages
 - 25 - Tobacco products
 - 26 - Yarn and thread; woven and tufted textile fabrics
 - 27 - Textile articles other than apparel
 - 28 - Knitted or crocheted fabrics; wearing apparel
 - 29 - Leather and leather products; footwear
- 3 - Other transportable goods, except metal products, machinery and equipment
 - 31 - Products of wood, cork, straw and plating materials
 - 32 - Pulp, paper and paper products; printed matter and related articles
 - 33 - Coke oven products; refined petroleum products; nuclear fuel
 - 34 - Basic chemicals
 - 35 - Other chemical products; man-made fibres
 - 36 - Rubber and plastics products
 - 37 - Glass and glass products and other non-metallic products n.e.c.
 - 38 - Furniture; other transportable goods n.e.c.
 - 39 - Wastes or scraps
- 4 - Metal products, machinery and equipment
 - 41 - Basic metals
 - 42 - Fabricated metal products, except machinery and equipment
 - 43 - General-purpose machinery
 - 44 - Special-purpose machinery
 - 45 - Office, accounting and computing machinery
 - 46 - Electrical machinery and apparatus
 - 47 - Radio, television and communication equipment and apparatus
 - 48 - Medical appliances, precision and optical instruments, watches and clocks
 - 49 - Transport equipment
- 5 - Constructions and construction services
 - 51 - Constructions
 - 52 - Construction services
- 6 - Distributive trade services; accommodation, food and beverage serving services; transport services; and electricity, gas and water distribution services
 - 61 - Wholesale trade services
 - 62 - Retail trade services
 - 63 - Accommodation, food and beverage services
 - 64 - Passenger transport services
 - 65 - Freight transport services
 - 66 - Rental services of transport vehicles with operators
 - 67 - Supporting transport services
 - 68 - Postal and courier services
 - 69 - Electricity, gas and water distribution (on own account)
- 7 - Financial and related services; real estate services; and rental and leasing services
 - 71 - Financial and related services
 - 72 - Real estate services
 - 73 - Leasing or rental services without operator
- 8 - Business and production services
 - 81 - Research and development services
 - 82 - Legal and accounting services
 - 83 - Other professional, technical and business services
 - 84 - Telecommunications, broadcasting and information supply services
 - 85 - Support services
 - 86 - Support services to agriculture, hunting, forestry, fishing, mining and utilities
 - 87 - Maintenance, repair and installation (except construction) services
 - 88 - Manufacturing services on physical inputs owned by others
 - 89 - Other manufacturing services; publishing, printing and reproduction services; materials recovery services
- 9 - Community, social and personal services
 - 91 - Public administration and other services provided to the community as a whole; compulsory social security services
 - 92 - Education services
 - 93 - Human health and social care services
 - 94 - Sewage and waste collection, treatment and disposal and other environmental protection services
 - 95 - Services of membership organizations
 - 96 - Recreational, cultural and sporting services
 - 97 - Other services
 - 98 - Domestic services
 - 99 - Services provided by extraterritorial organizations and bodies

Definitions: Residuals

2.92 Residuals are flows of solid, liquid and gaseous materials, and energy, that are discarded, discharged or emitted by establishments and households through processes of production, consumption or accumulation

Table 3.4

Typical components for groups of residuals

Group	Typical components
Solid waste (includes recovered materials) ^a	Chemical and health-care waste, radioactive waste, metallic waste, other recyclables, discarded equipment and vehicles, animal and vegetal wastes, mixed residential and commercial waste, mineral wastes and soil, combustion wastes, other wastes
Wastewater ^a	Water for treatment and disposal, return flows, reused water
Emissions to air	Carbon dioxide, methane, dinitrogen oxide, nitrous oxides, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride, carbon monoxide, non-methane volatile organic compounds, sulphur dioxide, ammonia, heavy metals, persistent organic pollutants, particulates (e.g., PM10 dust)
Emissions to water	Nitrogen compounds, phosphorus compounds, heavy metals, other substances and (organic) compounds
Emissions to soil	Leaks from pipelines, chemical spills
Residuals from dissipative use of products	Unabsorbed nutrients from fertilizers, salt spread on roads
Dissipative losses	Abrasion (tyres/brakes), erosion/corrosion of infrastructure (roads, etc.)
Natural resource residuals	Mining overburden, felling residues, discarded catch

^a This list of typical components for groups of residuals can also be applied to certain flows defined as products.

Compilation exercise

Compile a physical supply and use table for oil resources:

- Oil resources extracted by **Mining** (100 mln kg)
- **Mining** supplies 100 mln kg crude oil to **Refining**
- **Refining** produces 80 mln kg petrol
 - **Exports** 50 mln kg petrol
 - Supplies 30 mln kg petrol to **Households** (all is burned)
 - Burns 20 mln kg crude oil for own energy
- Burning (combustion):
 - Uses 3 units oxygen (O₂) per unit crude oil or petrol
 - Creates 4 units of CO₂ per unit of crude oil or petrol

Complete the table

How?

A. Follow the supply/use chain

B. Burning 1 kg crude oil and petrol uses 3 kg O₂ to create 4 kg CO₂

C. Calculate column and row totals and check accounting identities (supply = use)

D. Questions:

- Total natural inputs?
- Total products?
- Total residuals?
- Total materials?

Supply		Industry		Households	Import	Environment	Total
		Mining	Refining				
Natural Inputs	Oil resources					1	
	O ₂						
Products	Crude oil	3	5				
	Petrol						
Residuals	CO ₂						
Total							
Use		Industry		Households	Export	Environment	Total
		Mining	Refining				
Natural Inputs	Oil resources	2					
	O ₂						
Products	Crude oil		4				
	Petrol				6		
Residuals	CO ₂						
Total							

The supply/use chain

Supplier

User

1 Environment

→ 2 Mining

3 Mining

→ 4 Refining

5 Refining

→ 6 Households & Exports

Answers

Total natural inputs = 250

Total products = 180

Total residuals = 200

Total materials = 630

Supply		Industry		Households	Import	Environment	Total
		Mining	Refining				
Natural Inputs	Oil resources					100	100
	O ₂					150	150
Products	Crude oil	100					100
	Petrol		80				80
Residuals	CO ₂		80	120			200
Total		100	160	120	0	250	630

Use		Industry		Households	Export	Environment	Total
		Mining	Refining				
Natural Inputs	Oil resources	100					100
	O ₂		60	90			150
Products	Crude oil		100				100
	Petrol			30	50		80
Residuals	CO ₂					200	200
Total		100	160	120	50	200	630

Answers: Why?

Environment supplies 100 mln kg oil resources Mining

Supply		Industry		Households	Import	Environment	Total
		Mining	Refining				
Natural Inputs	Oil resources					100	100
	O ₂					150	150
Products	Crude oil	100					100
	Petrol		80				80
Residuals	CO ₂		80	120			200
Total		100	160	120	0	250	630

Use		Industry		Households	Export	Environment	Total
		Mining	Refining				
Natural Inputs	Oil resources	100					100
	O ₂		60	90			150
Products	Crude oil		100				100
	Petrol			30	50		80
Residuals	CO ₂					200	200
Total		100	160	120	50	200	630

Answers: Why?

Mining supplies 100 mln kg crude oil to Refining

Supply		Industry		Households	Import	Environment	Total
		Mining	Refining				
Natural Inputs	Oil resources					100	100
	O ₂					150	150
Products	Crude oil	100					100
	Petrol		80				80
Residuals	CO ₂		80	120			200
Total		100	160	120	0	250	630

Use		Industry		Households	Export	Environment	Total
		Mining	Refining				
Natural Inputs	Oil resources	100					100
	O ₂		60	90			150
Products	Crude oil		100				100
	Petrol			30	50		80
Residuals	CO ₂					200	200
Total		100	160	120	50	200	630

Answers: Why?

Refining supplies 30 mln kg petrol to Households and 50 mln kg to Exports

Supply		Industry		Households	Import	Environment	Total
		Mining	Refining				
Natural Inputs	Oil resources					100	100
	O ₂					150	150
Products	Crude oil	100					100
	Petrol		80				80
Residuals	CO ₂		80	120			200
Total		100	160	120	0	250	630

Use		Industry		Households	Export	Environment	Total
		Mining	Refining				
Natural Inputs	Oil resources	100					100
	O ₂		60	90			150
Products	Crude oil		100				100
	Petrol			30	50		80
Residuals	CO ₂					200	200
Total		100	160	120	50	200	630

Answers: Why?

Refining burns 20 mln kg crude oil, environment supplies 60 mln kg O₂ to supply 80 mln kg CO₂

Households burn 30 mln kg petrol, environment supplies 90 mln kg O₂ to supply 120 mln kg CO₂

Supply		Industry		Households	Import	Environment	Total
		Mining	Refining				
Natural Inputs	Oil resources					100	100
	O ₂					150	150
Products	Crude oil	100					100
	Petrol		80				80
Residuals	CO ₂		80	120			200
Total		100	160	120	0	250	630

Use		Industry		Households	Export	Environment	Total
		Mining	Refining				
Natural Inputs	Oil resources	100					100
	O ₂		60	90			150
Products	Crude oil		100				100
	Petrol			30	50		80
Residuals	CO ₂					200	200
Total		100	160	120	50	200	630

Welcome to Level 2!

- A few more concepts
 - Types of natural resource residuals
 - Is it a product or a residual?
 - Transboundary flows
 - How to account for losses
- Data sources
- Compilation challenges
- Discussion on country priorities

Concepts

- Types of natural resource residuals

Losses during
extraction

Resources the extractor would prefer to retain;
Example: losses of gas through flaring and venting

Unused extraction

Resources in which the extractor has no ongoing
interest;
Example: mining overburden; mine de-watering;
discarded catch

Reinjections

Natural resources that are extracted but are immediately
returned to the deposit and may be re-extracted at a
later time;
Example: water injected into aquifer; natural gas
reinjection

Concepts

- Product or residual?
 - If *payment* made = solid waste **product** (e.g., recycled materials)
 - Household
 - Newspapers = recycled or garbage?
 - Recycling industry: recovers residual → product
 - Waste management industry → solid waste → residual
 - Business
 - Newspapers = recycled
 - Sell to Recycling industry → product

Concepts

- Transboundary flows of residuals
 - Only **products** are imported and exported (could include solid waste “products” such as scrap metal)
 - **Residuals** (e.g. polluted water, emissions, solid wastes) flow within the environment

Concepts

“Losses” are residuals the supplier would prefer to retain

Losses during extraction	...occur during extraction before processing...
Losses during distribution	...between abstraction, extraction or supply and point of use...
Losses during storage	...energy products and materials...
Losses during transformation	Losses during transformation

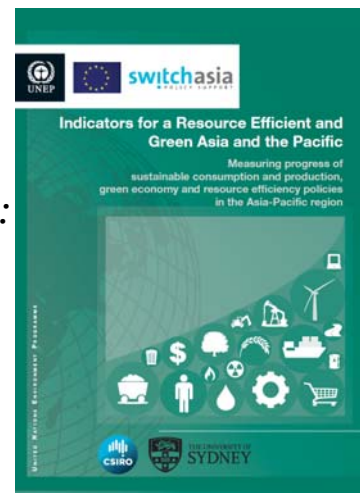
Data sources

- Industry & household surveys
 - Inputs/outputs of materials, energy, water, residuals
 - Government/private waste management
- Administrative & regulatory data
 - Imports, exports, consumption
 - Pollutant release and transfer register
- Field measurement
 - Waste, water, energy, materials audits
 - Engineering design factors (estimate losses...)
- Existing statistics
 - National Accounts (\$ supply/use to estimate physical)
 - Energy balances
 - Company reports

Data sources

UNEP: *Indicators for a Resource Efficient and Green Asia and the Pacific: Toolkit Page*

- Data from national and international sources
- Visualize data
- Download data



Compilation challenges

- Correcting for **residence principle**
 - Tourists, foreign airplanes \neq consumers
- Disaggregating & linking information to ISIC
 - Details, details, details (material type...)
 - Data may be on “activity” (fuel used for transport)
 - Household “sector” engaged in productive activity
- Consistency with National Accounts concepts
 - Within enterprise flows in SEEA (not in SNA)
- Compiling time series
 - Sources and detail change over time (e.g., industry surveys include quantities or \$ value)
 - Prices change over time (price x volume = value)

Documentation challenges

- There are some inconsistencies between SEEA-CF and SEEA-Water
 - SEEA-Water is based on SEEA-2003
 - e.g., “Supply” / “Use”
 - e.g., “Consumption” = “Use”
 - Extraction/abstraction = Supply
- SEEA-Energy is based on SEEA-2012
- Suggest using SEEA-CF (2012) as the primary guidance and sub-components for details



Discussion

- Which physical flow accounts could be a priority in your country?
 - Materials, Water, Energy
 - Solid Wastes, Air emissions, Wastewater
- What sources of data do you have?
- What are the gaps?
- What would be the next steps:
 - New data?
 - Collaborate with data sources? Stakeholders? Funding?
 - Learn how to create accounts?

References

- SEEA-CF:
http://unstats.un.org/unsd/envaccounting/seeaRev/SEEA_CF_Final_en.pdf
- SEEA-Energy:
<http://unstats.un.org/unsd/envaccounting/seeae/chapterList.asp>
- SEEA-Water:
<http://unstats.un.org/unsd/envaccounting/seeaw/seeawaterwebversion.pdf>
- SEEA-Agriculture, Forestry and Fisheries:
http://unstats.un.org/unsd/envaccounting/aff/2GC_Draft.pdf
- OECD PRTR (Pollutant release and transfer registry):
<http://www.oecd.org/chemicalsafety/pollutant-release-transfer-register/>
- UNEP: Indicators for a Resource Efficient and Green Asia and the Pacific:
Toolkit Page
<http://www.unep.org/roap/Activities/ResourceEfficiency/IndicatorsforaResourceEfficient/tabid/1060186/Default.aspx>

Acknowledgements

- Materials adapted from:
 - Joe St. Lawrence (Statistics Canada; Chiba, Japan; Feb. 23, 2016)
 - Julian Chow (UNSD; Malaysia; Sept. 23, 2013)
 - Ole Gravgård (Statistics Denmark; Addis Ababa, Ethiopia; Feb. 2, 2015)

Thank you

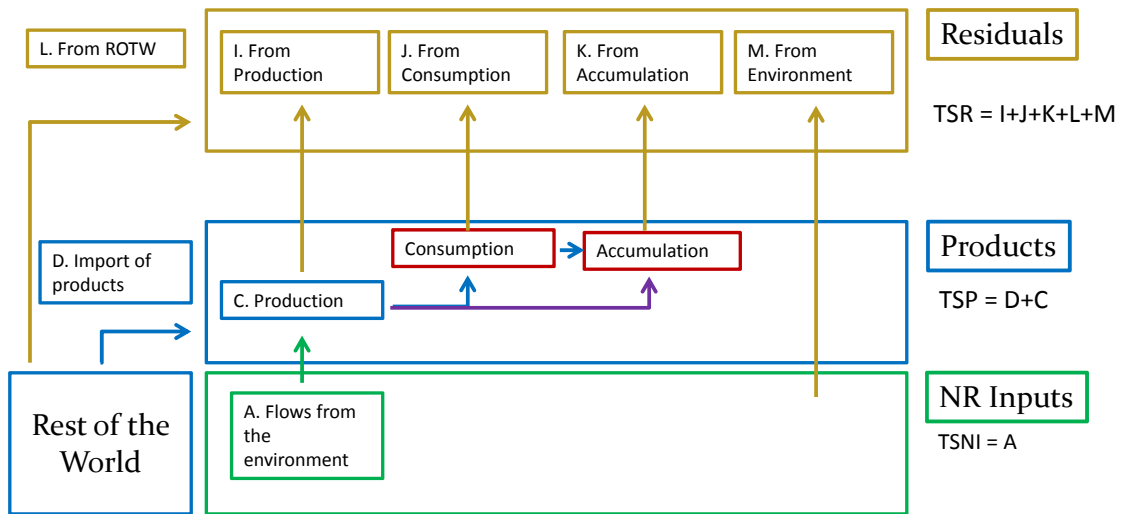
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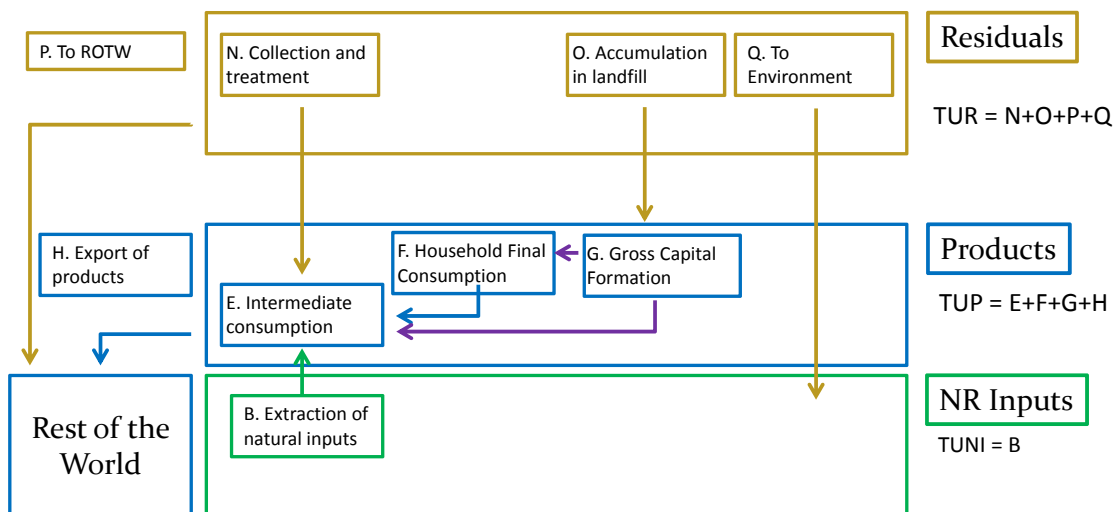
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Physical supply



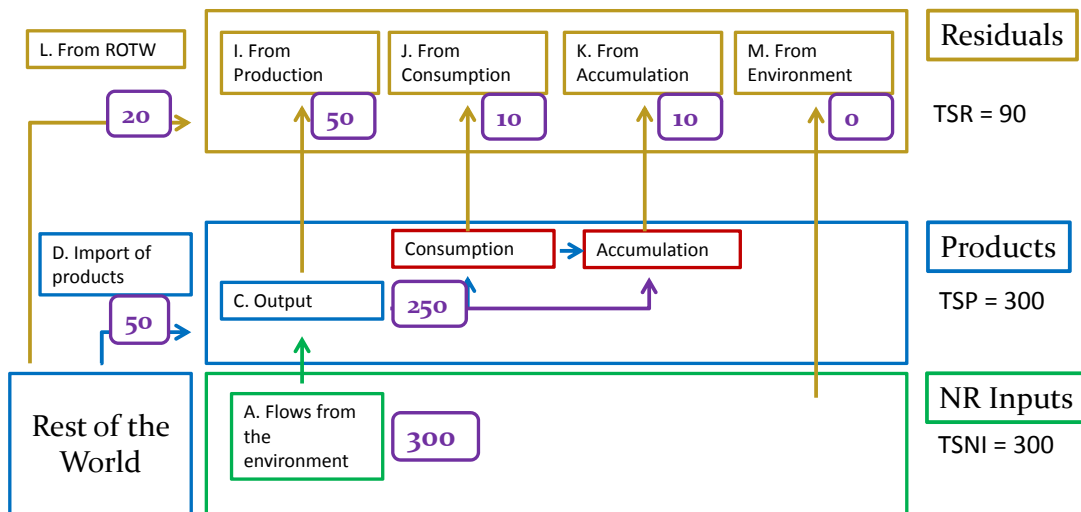
Physical use



Example: Tires

- Supply
 - A. Natural inputs: petroleum (300T)
 - $TSNI = A = 300T$
 - D. Import of tires (50T)
 - C. Manufacture of tires (250T)
 - $TSP = C + D = 300T$
 - I. Residuals generated manufacturing tires (50T)
 - J. Residuals generated by household final consumption (10T)
 - K. Residuals from scrapping and demolition (10T)
 - L. Residuals received from the Rest of the World (scrap tires) (20T)
 - M. Residuals recovered from the environment (scrap tires) (0T)
 - $TSR = I + J + K + L + M = 90T$

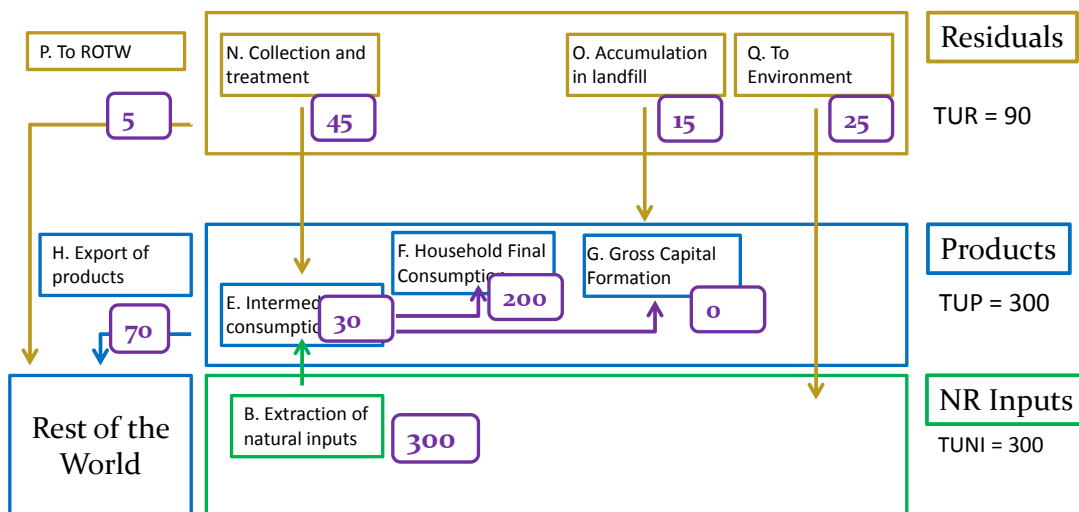
Physical supply: Tires (Mtonnes)



Example: Tires

- Use
 - B. Extraction of natural inputs: petroleum (300T)
 - $TUNI = B = 300T$
 - E. Intermediate consumption (30T)
 - F. Household final consumption (200T)
 - G. Gross fixed capital formation (0T)
 - H. Export of tires (70T)
 - $TUP = E + F + G + H = 300T$
 - N. Collection and treatment of residuals (recycling)(45T)
 - O. Accumulation in controlled landfill (15T)
 - P. Exported scrap tires (5T)
 - $TUR = N + O + P + Q = 90T$
 - Q. Flows to the environment (uncontrolled) (25T)

Physical use: Tires (Mtonnes)



Exercise? Animal and vegetal waste

- Supply
 - Generation of solid waste residuals:
 - Other industries: 50T Agriculture, 200T Food and beverage, 100T Service
 - 100T Households
 - 90T Imported
 - TSR = 540T
 - Generation of solid waste products:
 - 200T generated by agriculture (fertilizer & animal feed)
 - 50T imported
 - TSP = 250T
- Use
 - Use of solid waste residuals
 - Waste collection and treatment industry: 40T landfill, 200T to incineration (40T to generate energy), 90T recycled and reused, 20T other treatment
 - Other industries: 50T used to make recycled products
 - Exported: 20T
 - Flows to the environment: 120T
 - TUR = 540T
 - Use of solid waste products
 - Recycling and reuse: 120T
 - Other industries: 130T
 - TUP = 250T

An actual dialogue

Survey manager: ☺ (release): *Water use in the power generation industry increased by 15% over last year!*

SEEA manager: *OK, but why did it increase by 500% in the nuclear energy sector?*

Survey manager: *How do you know?*

SEEA manager: *I put the numbers into my Physical Supply and Use table for Water.*

Survey manager: *I'll ask the methodologist.*

Methodologist: *Sorry about that! We weighted the responses at the 2-digit level. Nuclear power (population of one at 3-digit level) was weighted by 4.*

Survey Manager: ☹ (revision): *Total water use in the power generation industry increased by 10% over last year!*

Accounting identities

- Supply and use identity

Total Supply (including imports) = Total Use (including exports)	
Total Supply	Total Use
of Natural Resource Inputs (TSNI) =	of Natural Resource Inputs (TUNI)
of Products (TSP) =	of Products (TUP)
of Residuals (TSR) =	of Residuals (TUR)