

# SNA 2008, Satellite Accounts and Environmental Accounts



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# Session outline

- Brief introduction system of national accounts (SNA)
- Why extend or modify the national accounts?
- Environmental accounts: what are they and what do they cover?



# What are national accounts?

- An integrated set of macro-economic accounts showing relevant **flows** and **stocks** related to economic activity
- Accounts are based on relevant international guidelines - SNA
- System of National Accounts, SNA (1993 → 2008)



# Information system



## Key macro economic indicators

GDP, household consumption, industry gross value added, trade balance and government deficit

## Detailed macro economic accounts

Supply – use tables,  
Sector accounts,  
Financial accounts,  
Balance sheets

**Basic data**



# SNA: An integrated framework based on accounting identities

- Transaction identity:  
 $\text{Outlay} = \text{Receipt}$
- For goods and services  
 $\text{Supply} = \text{Use}$
- When international trade is included:  
 $\text{Domestic production} + \text{import (Supply)} = \text{Domestic use} + \text{export (Use)}$



# Framework based on accounting identities...

- Based on double entry accounting principle (same as business accounts)

Example: cash sale / purchase of motor car

|                            | Car seller |   | Car buyer |
|----------------------------|------------|---|-----------|
| Goods and services account |            |   |           |
| Car                        | \$20,000   | → | \$20,000  |
| Financial account          |            |   |           |
| Cash                       | \$20,000   | ← | \$20,000  |

# Supply-Use table

| Supply table \$Bn     |                  |                    |          |         |           |
|-----------------------|------------------|--------------------|----------|---------|-----------|
|                       | Agric-<br>ulture | Manuf-<br>acturing | Services | Imports | Total     |
| Agricultural products | 10               |                    |          |         | 10        |
| Manufactured products |                  | 16                 |          | 10      | 26        |
| Services              |                  |                    | 33       |         | 33        |
|                       |                  |                    |          |         | <b>69</b> |
| Total                 | 10               | 16                 | 33       | 10      |           |

| Use table \$Bn           |                  |                    |          |                  |                      |        |           |
|--------------------------|------------------|--------------------|----------|------------------|----------------------|--------|-----------|
|                          | Agric-<br>ulture | Manuf-<br>acturing | Services | Consum-<br>ption | Capital<br>formation | Export | Total     |
| Agricultural products    |                  |                    |          | 8                |                      | 2      | 10        |
| Manufactured products    | 2                | 6                  | 4        | 4                | 6                    | 4      | 26        |
| Services                 | 6                | 5                  | 10       | 10               |                      | 2      | 33        |
|                          |                  |                    |          |                  |                      |        | <b>69</b> |
| Value added<br>(balance) | 2                | 5                  | 19       |                  |                      |        | 26        |
|                          |                  |                    |          |                  |                      |        |           |
| Total                    | 10               | 16                 | 33       | 22               | 6                    | 8      |           |

# Production Boundary

- All **economic production** carried out under the control and responsibility of an institutional unit that uses inputs of labour, capital, and goods and services to produce outputs of goods and services falls within the SNA production boundary.





# Asset Boundary

- All assets over which ownership rights are enforced by institutional units, individually and collectively; and from which **economic benefits** may be derived by their owners by holding them, or using them over a period of time, fall within the SNA asset boundary.



# Defining Gross Domestic Product (GDP)

- *Income approach:*  
GDP = Value added (compensation of employees, gross operating surplus, net taxes on production)
- *Production approach:*  
GDP = outputs – intermediate consumption
- *Expenditure approach:*  
GDP = consumption + investment + exports – imports (= C + I + E + M)



# Defining GDP volume growth

- GDP growth in current prices =

GDP Current Prices x GDP deflator

In practice, it is the various components making up GDP that are individually deflated (i.e. the GDP deflator is a composite deflator)



# SNA Classifications

- Based on the UNSD classifications
- Industries
  - International Standard Industrial Classification (ISIC)
  - Agriculture; Mining & Quarrying; Manufacturing etc...
- Products
  - Central Product Classification (CPC)
- Consistency between SNA & SEEA



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# Institutional sector accounts

- **Standard Institutional Sector Classification of Australia**
- Non-financial corporations; Financial corporations; General government; Households NPIs, serving households; Rest of the world
- Enables transfers to be identified



# Conclusions

- A very brief picture...  
Strength of national accounts:
  - \* internationally accepted and widely used system
- Links indicators and accounts
- Definitions, concepts and classifications serve mainstream economic analyses well
  - But not necessarily other types of analyses...



# General principles of satellite accounting

- National accounts governed by the principles of System of National Accounts (SNA)
- these principles are consistent, coherent
- but, sometimes more appropriate to use different principles



# General principles of satellite accounting, *cont...*

- we prefer not to disrupt the 'core' national accounts
- so we undertake these analyses separate from the 'core' national accounts (i.e. in 'satellite' context)



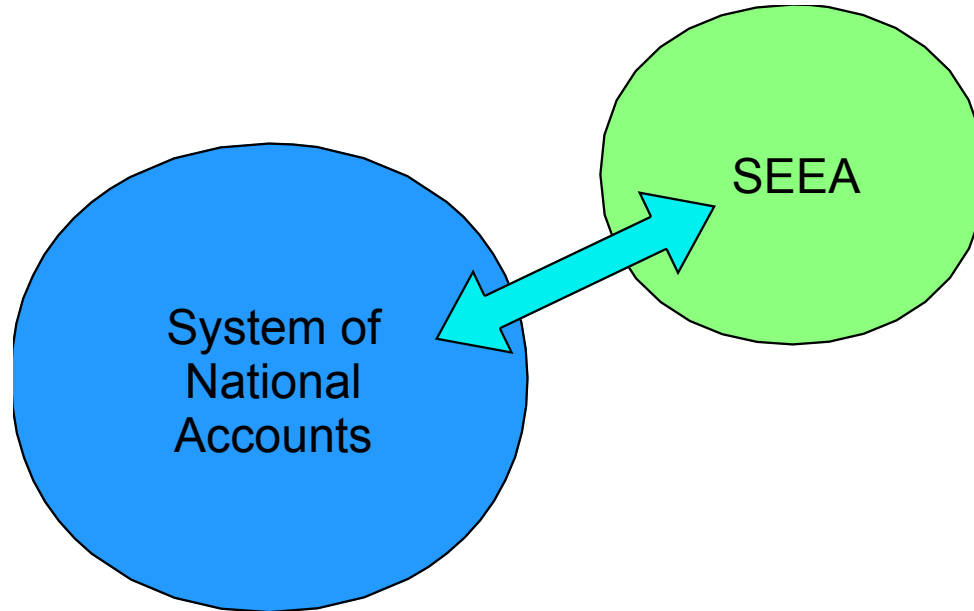


# General principles of satellite accounting, *cont...*

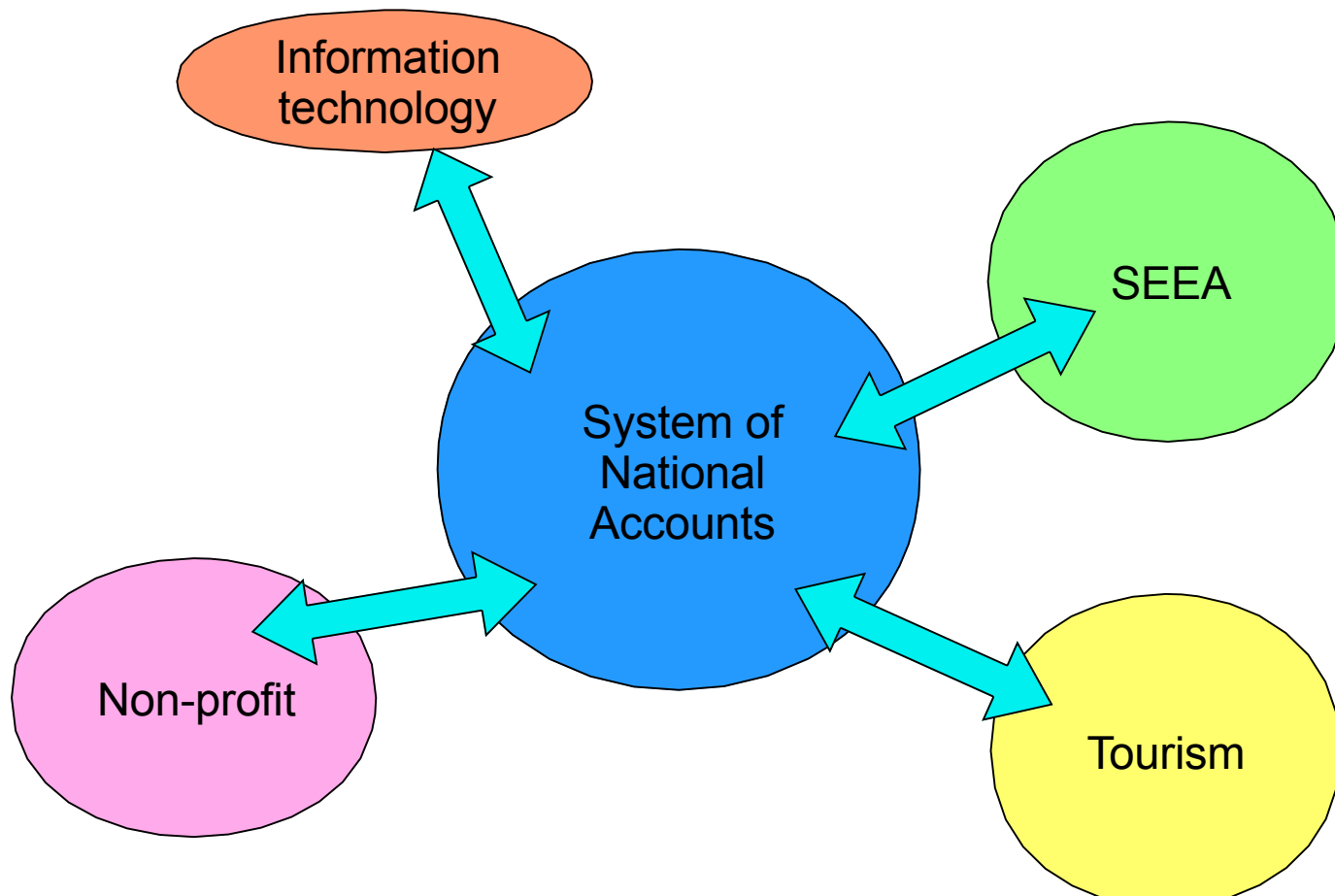
- Most satellite accounts use re-worked versions of the key SNA tables
  - e.g. GDP account, showing depletion of natural resources
- Many are based on supply and use tables
  - e.g. Tourism, IT
- Some construct new suites of tables
  - e.g. SEEA (Physical Accounts)



# SEEA began as a 'satellite account' of the SNA



# SEEA is one of many satellite accounts



# Why satellite accounting?

1. Deepening of specific sectors or functional activities – transport, health, environment...
2. Introduce alternative concepts
3. Supplementary datasets





# 1. Deepening specific sectors

- E.g. how much does environment protection contribute to employment or to GDP?
  - Main producers of environment protection services: water purification; waste treatment...
  - Suppliers of environmental protection equipment
  - Environment protection activities on own account



# Why satellite accounting?

1. Deepening of specific sectors or functional activities – transport, health, environment...
- 2. Introduce alternative concepts**
3. Supplementary datasets



# Alternative concepts in the national accounts

- Production boundary
  - Most household production excluded
  - Services provided by the natural environment are excluded
  - Learning is not a productive activity
- Asset boundary
  - A number of environmental assets are not included as part of economic wealth on the national balance sheet



# Why satellite accounting?

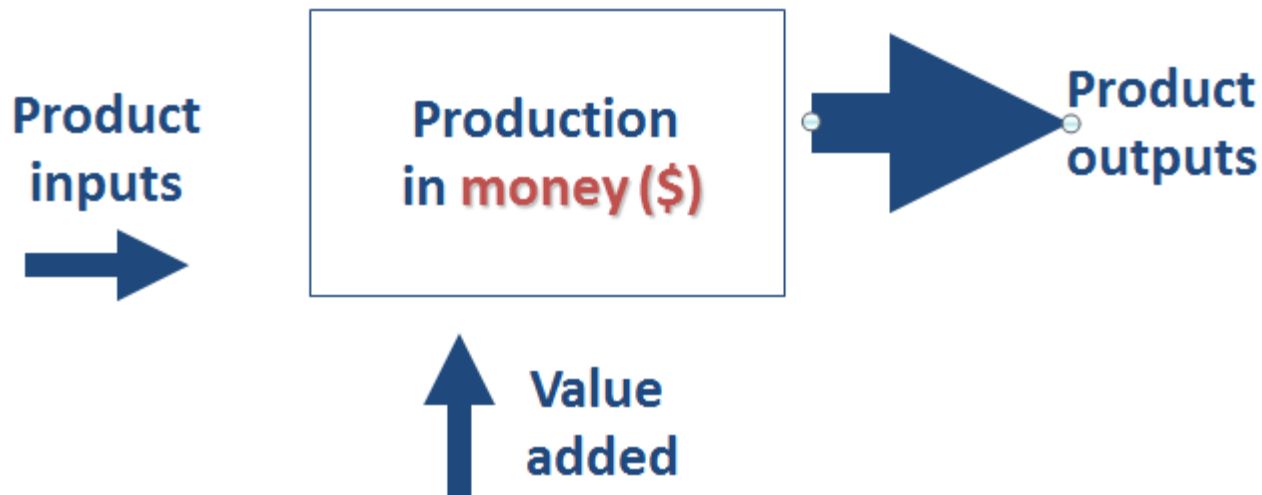
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- 3. Supplementary datasets**





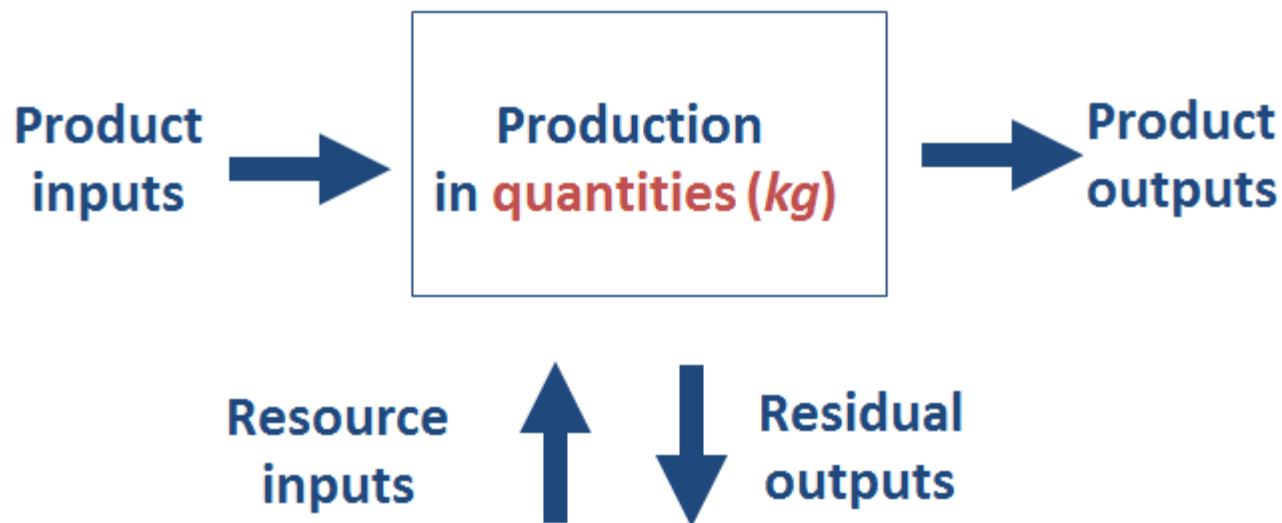
# Supplementary data sets

Monetary data sets:  
*economic accounting (SNA)*



# Supplementary data sets *cont...*

## Non-monetary data sets: *environmental accounting (SEEA)*



# Why satellite accounting?

## Conclusions:

1. Standard national accounts are a powerful tool but are not always appropriate
2. Alternative concepts, classifications and supplementary datasets may add analytical usefulness to national accounts in specific areas.
3. National accounting is a powerful tool to link indicators to detailed information systems



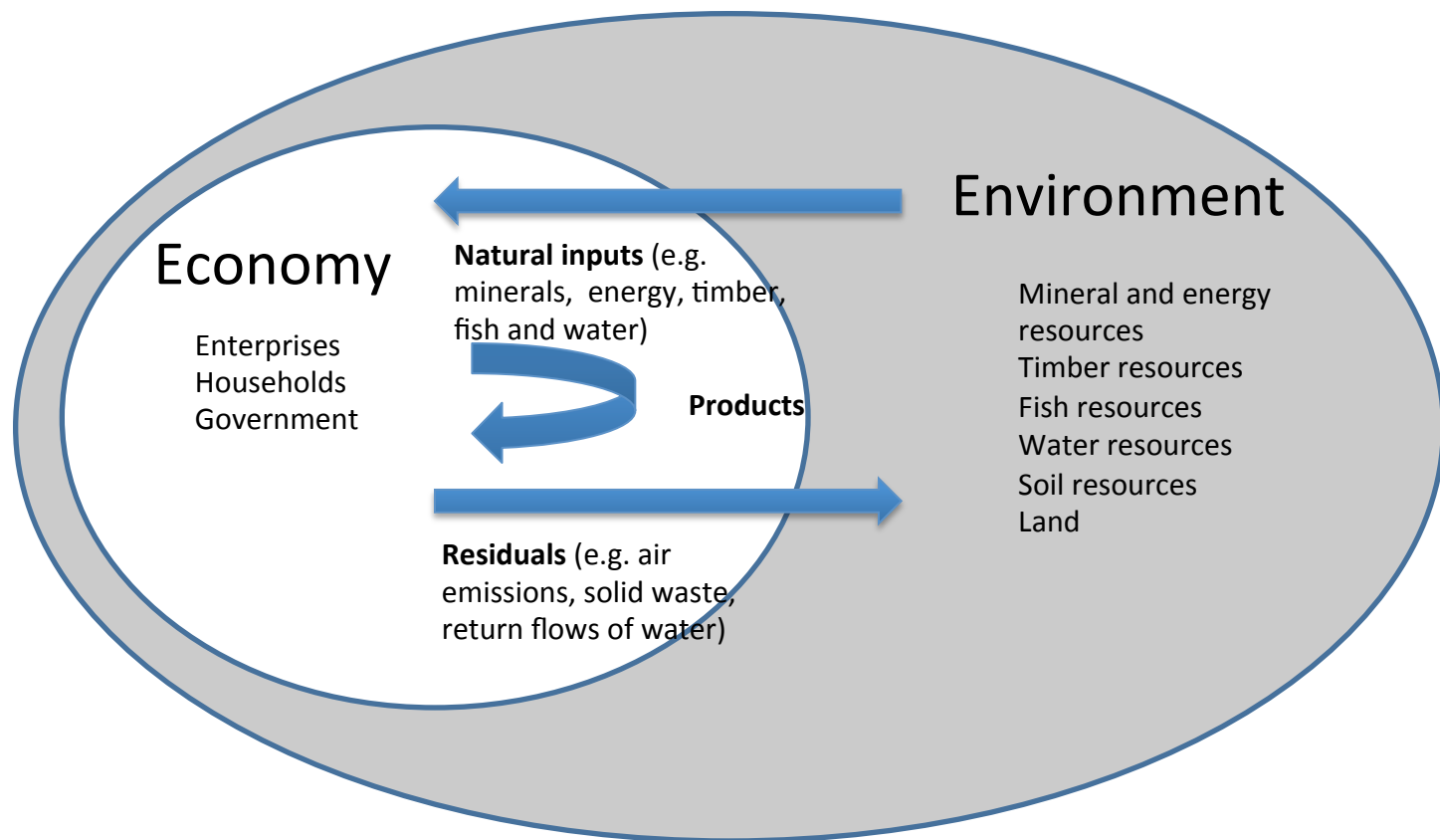
# Environmental accounting:

The application of national accounts concepts, frameworks and classifications for a statistical description of environmental-economic dependencies

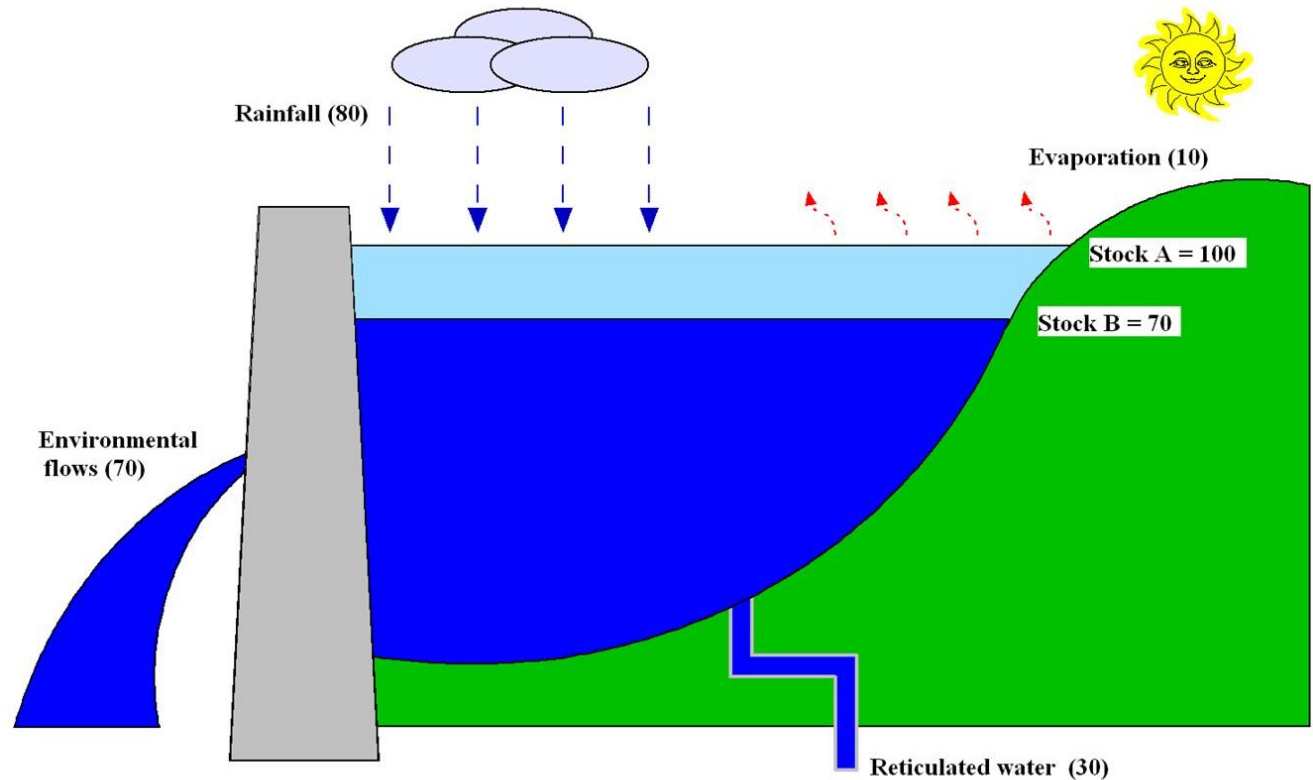




# Environmental accounts, what are they and what do they cover?



# The Concept of Stocks and Flows



Stock A = 100

Flows = -30 (Rainfall - Evaporation - Environmental flows - Reticulated Water)

Stock B = 70

# Environmental accounting

I. The physical economy (flows)

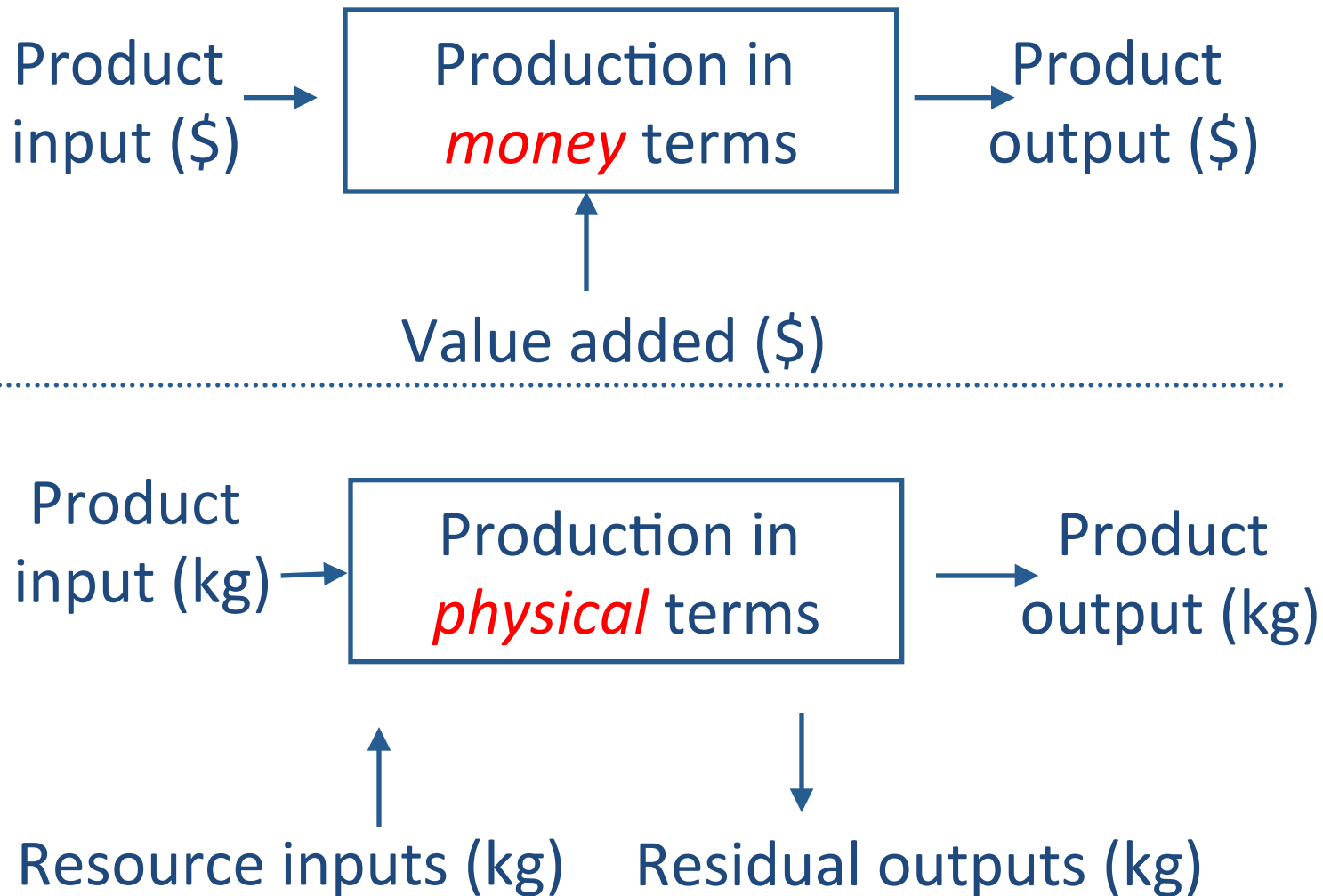
II. Environmental capital

III. Environment-related changes of the economic system

IV. Adjusting national accounts aggregates



# I. The physical economy:

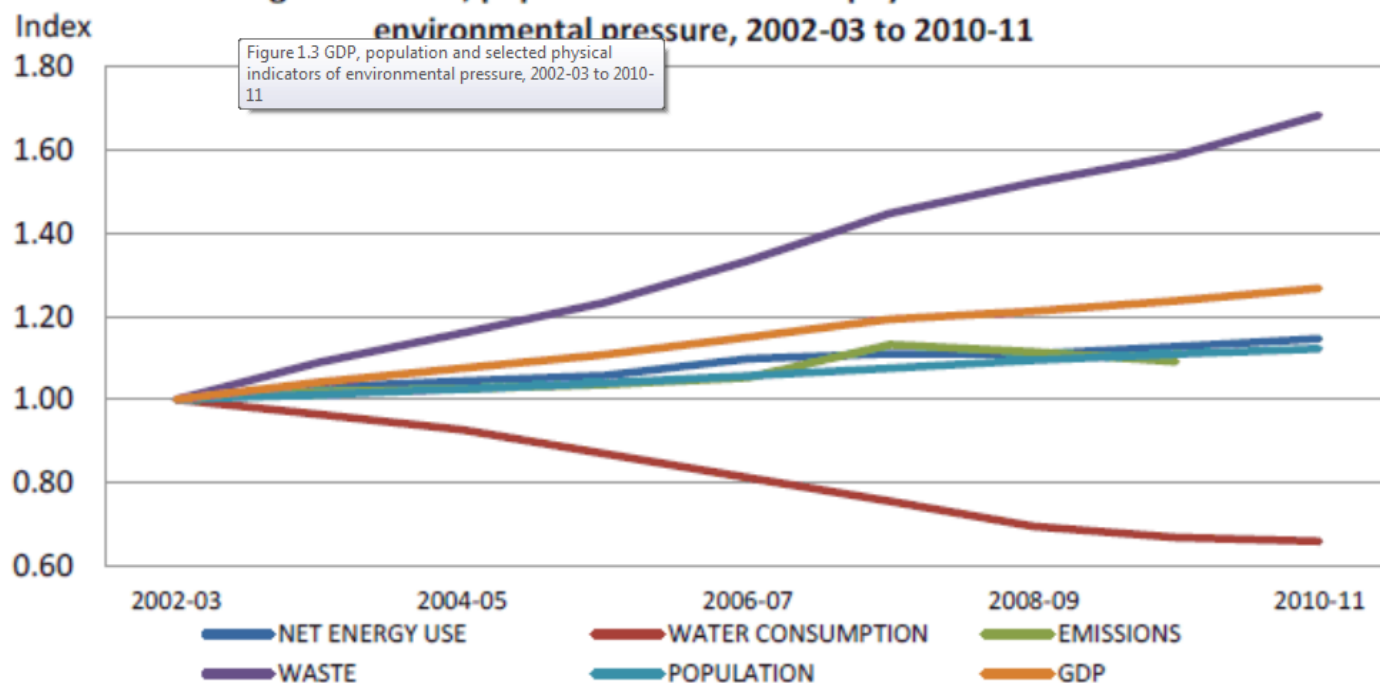




# The physical economy:

## Decoupling environmental pressures from economic growth

Figure 1.3 GDP, population and selected physical indicators of environmental pressure, 2002-03 to 2010-11



Note: Index: 2002-03 = 1

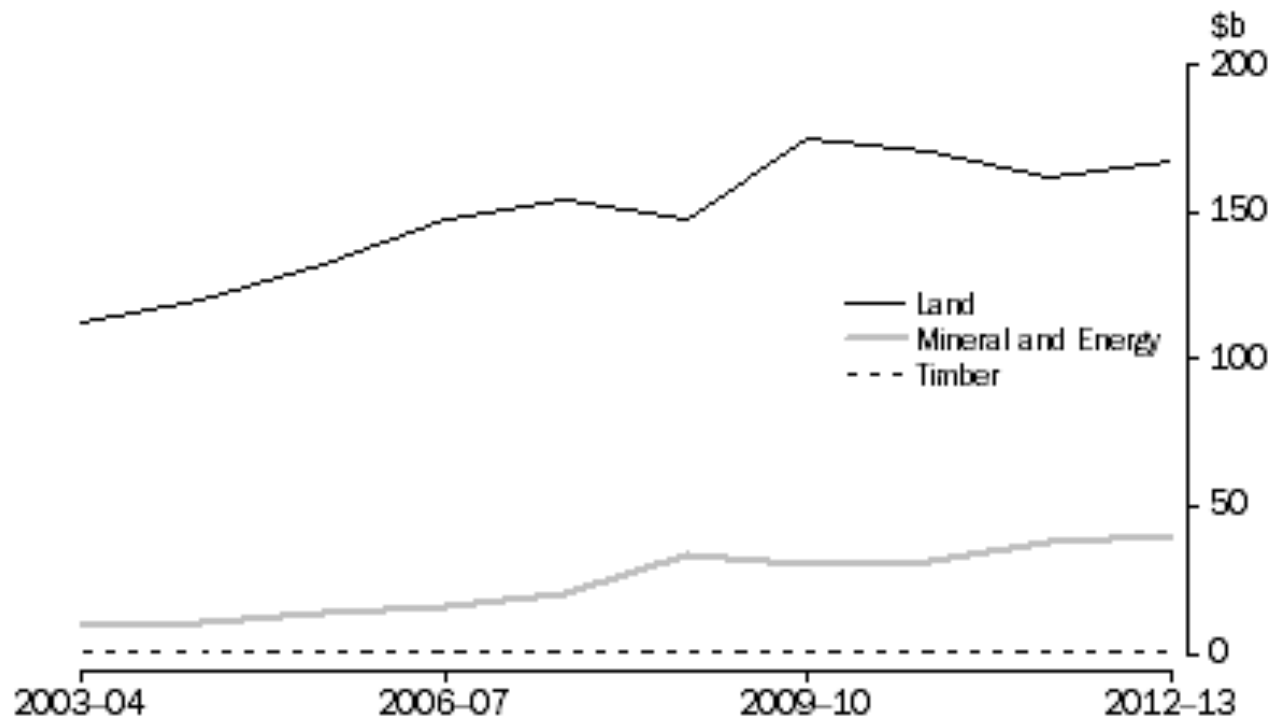
Sources: ABS; Department of Climate Change and Energy Efficiency; Department of Sustainability, Environment, Water, Population and Communities.

## II. Environmental capital:

- Capital in the **national accounts**:
- Fixed assets (produced: machinery, equipment, dwellings)
- Non-produced assets:
  - ⇒ Tangible (land, subsoil assets, non-cultivated biological assets, water resources)
  - ⇒ Intangible (goodwill)
- Financial assets (currency, loans, bonds, shares)



## II. Environmental capital:



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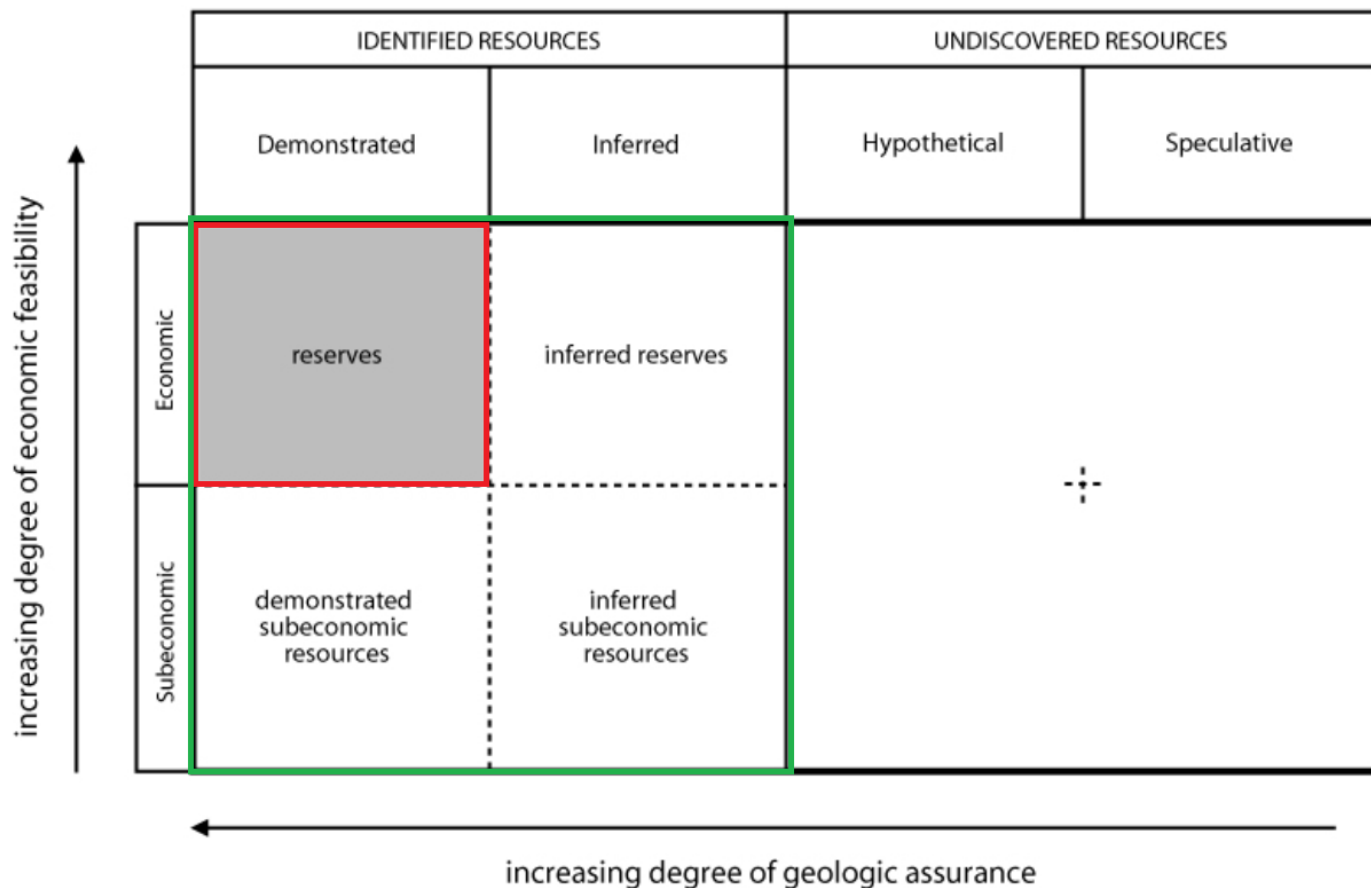
- Capital in the Integrated **Environmental-Economic Accounts (SEEA)**:
- Expansion of the non-produced tangible assets in detail and in number of categories, for example:
- Different types of land and water bodies
- Additional asset types, for example:
  - ⇒ Soil resources
  - ⇒ Ecosystems (terrestrial, aquatic)





# II. Environmental capital:

McKelvey diagram for coal or gas reserves



**SNA Scope** – Economic Demonstrated Resource  
**SEEA Scope** – ALSO INCLUDES Subeconomic Demonstrated Resource

### III. Environment-related changes of the economic system:

- Environment related economic activities
- Environment related services  
*⇒ Environmental Protection Expenditure Accounts (EPEA)*
- Environmental taxes and subsidies
- Clean up costs and environmental costs related to the disposal of fixed assets



## IV. Adjusting national accounts aggregates:

- How can the costs of using up or damaging the environment be reflected in national accounts aggregates (GDP, Saving)?
- A variety of possible answers:  
*'Env-adjusted Domestic Product', 'Sustainable NI', 'Genuine Saving', 'Green GDP'...*
- What are the underlying concepts and what are their policy uses?



# Conclusions

## *Domains of environmental accounting:*

1. Accounting for the physical economy and its industrial metabolism
2. Accounting for environmental assets
3. Accounting for environment related transactions
4. Valuation of environmental damages and the adjustment of national accounts balancing items





# Questions?

