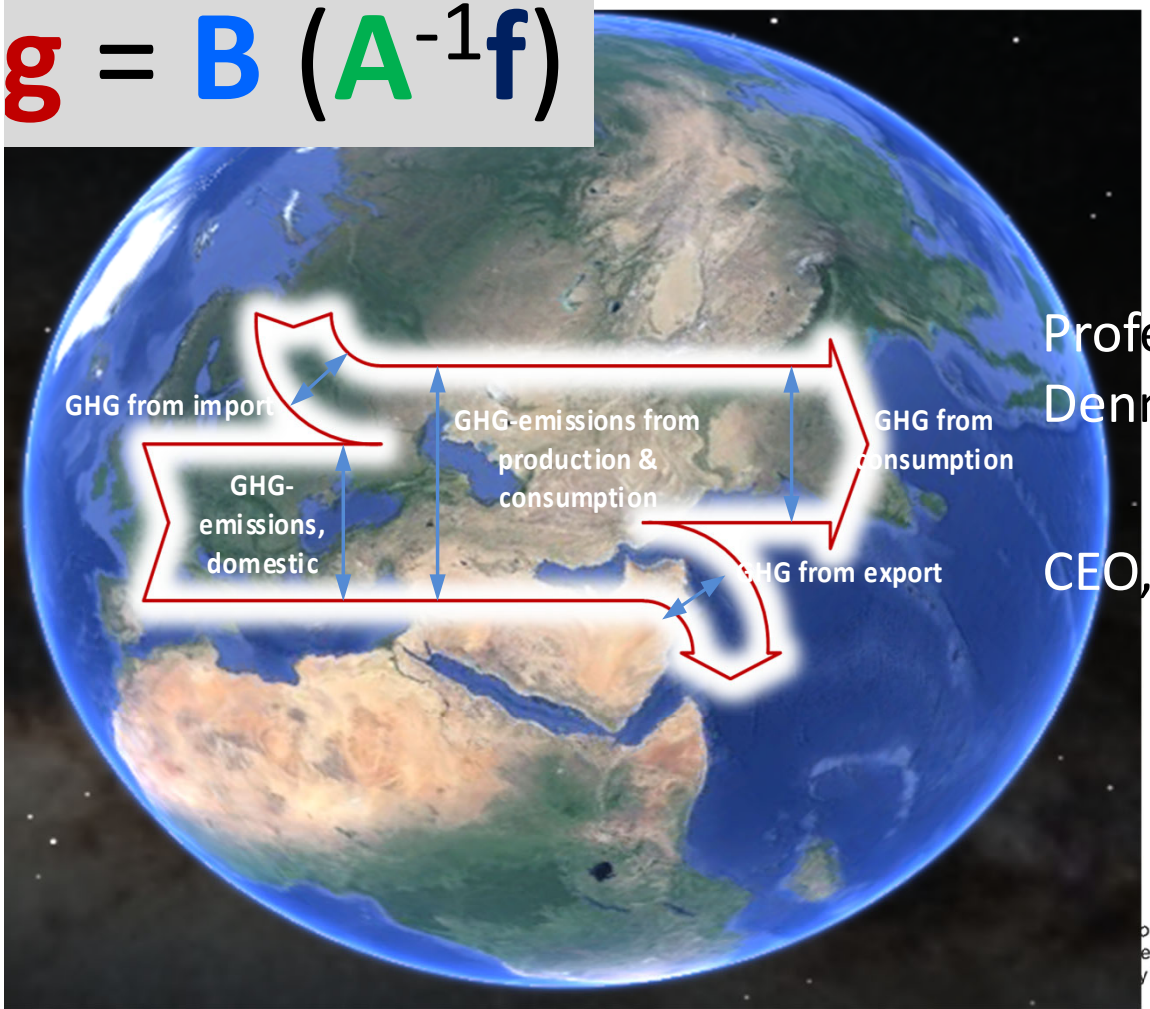
Input-output modelling

Dealing with imports and exports

$$g = B\,(A^{-1}f)$$



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DCEA | THE DANISH CENTRE FOR ENVIRONMENTAL ASSESSMENT

CEO, 2.-0 LCA consultants

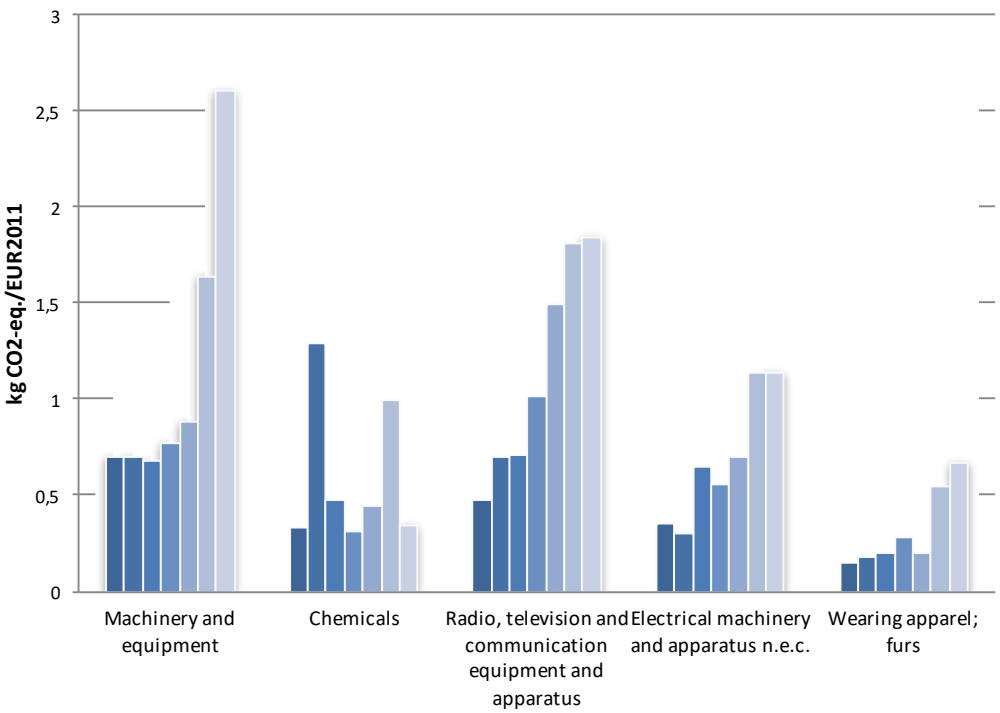
Updated: 20th April 2022

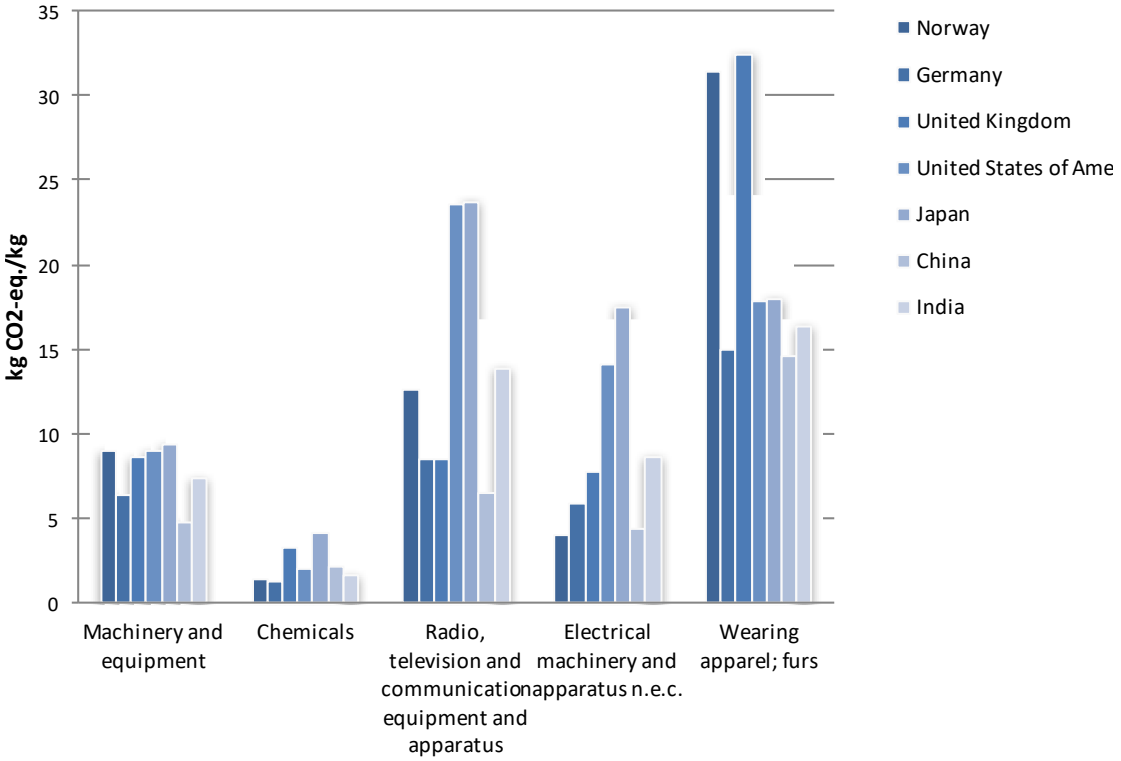
Agenda

- Does trade matter?
- Different ways to deal with trade in IO models
- Using markets for the modelling of trade in the SUT framework
- Linking by-product to international markets in the SUT framework

Does trade matter?
- GHG-intensity

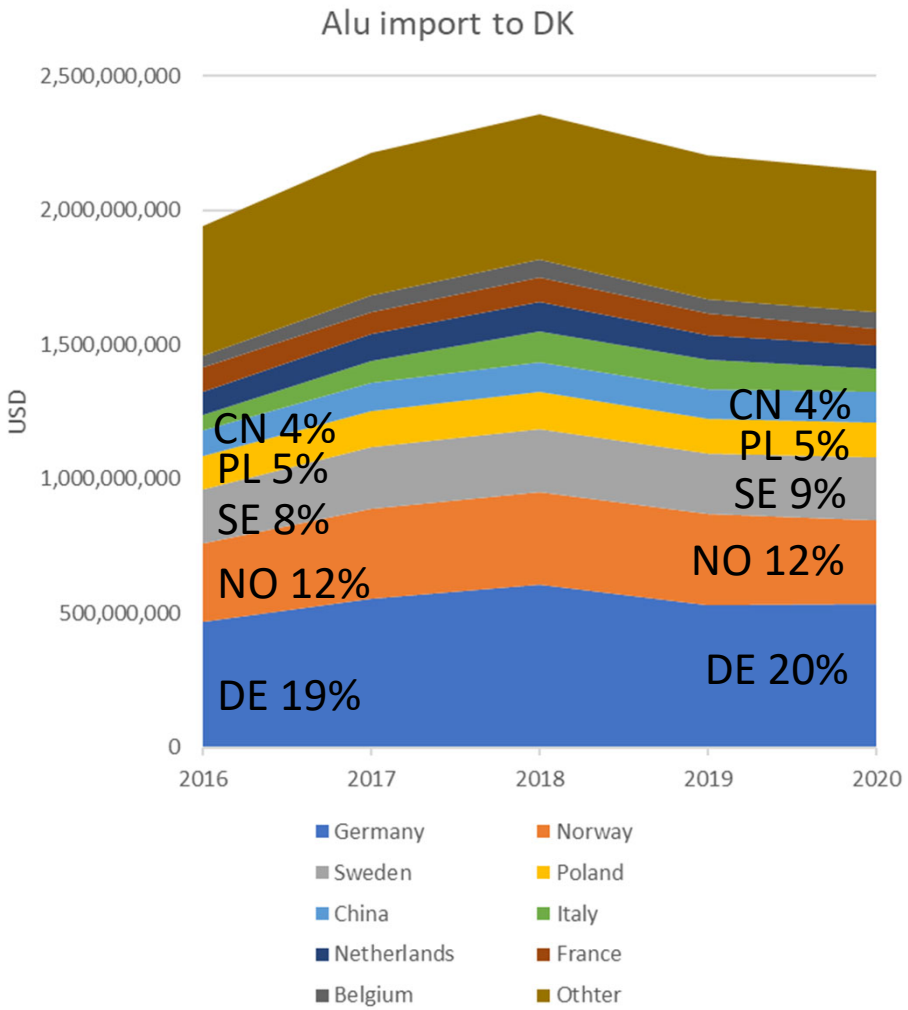
- Exiobase v3.3.13b1, year 2011
- http://www.exiobase.eu/

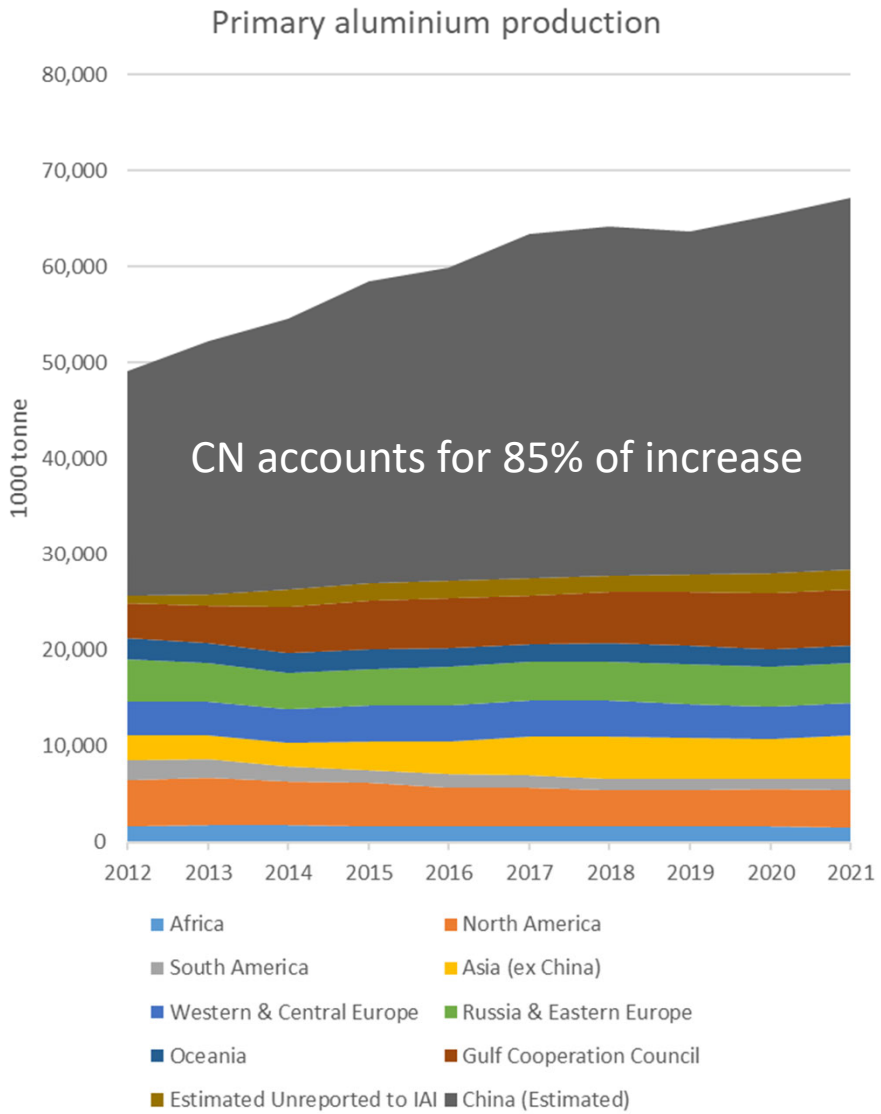




Challenges relating to the modelling of trade
- consequential vs attributional models

- **Inputs to markets**
  - Average vs marginal
  - By-products





https://comtrade.un.org/

https://international-aluminium.org/statistics/primary-aluminium-production/

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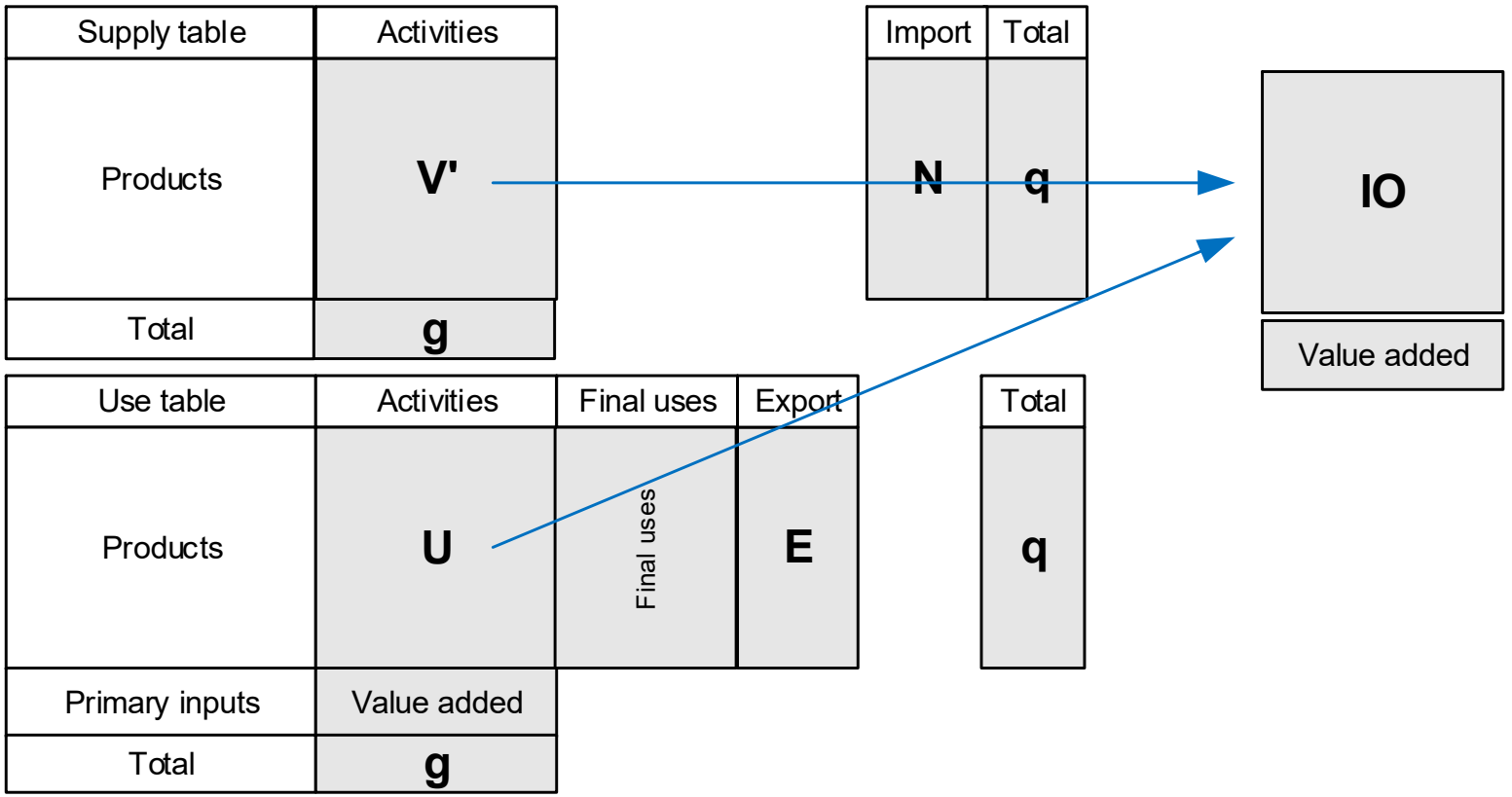
Simplest solution to deal with trade

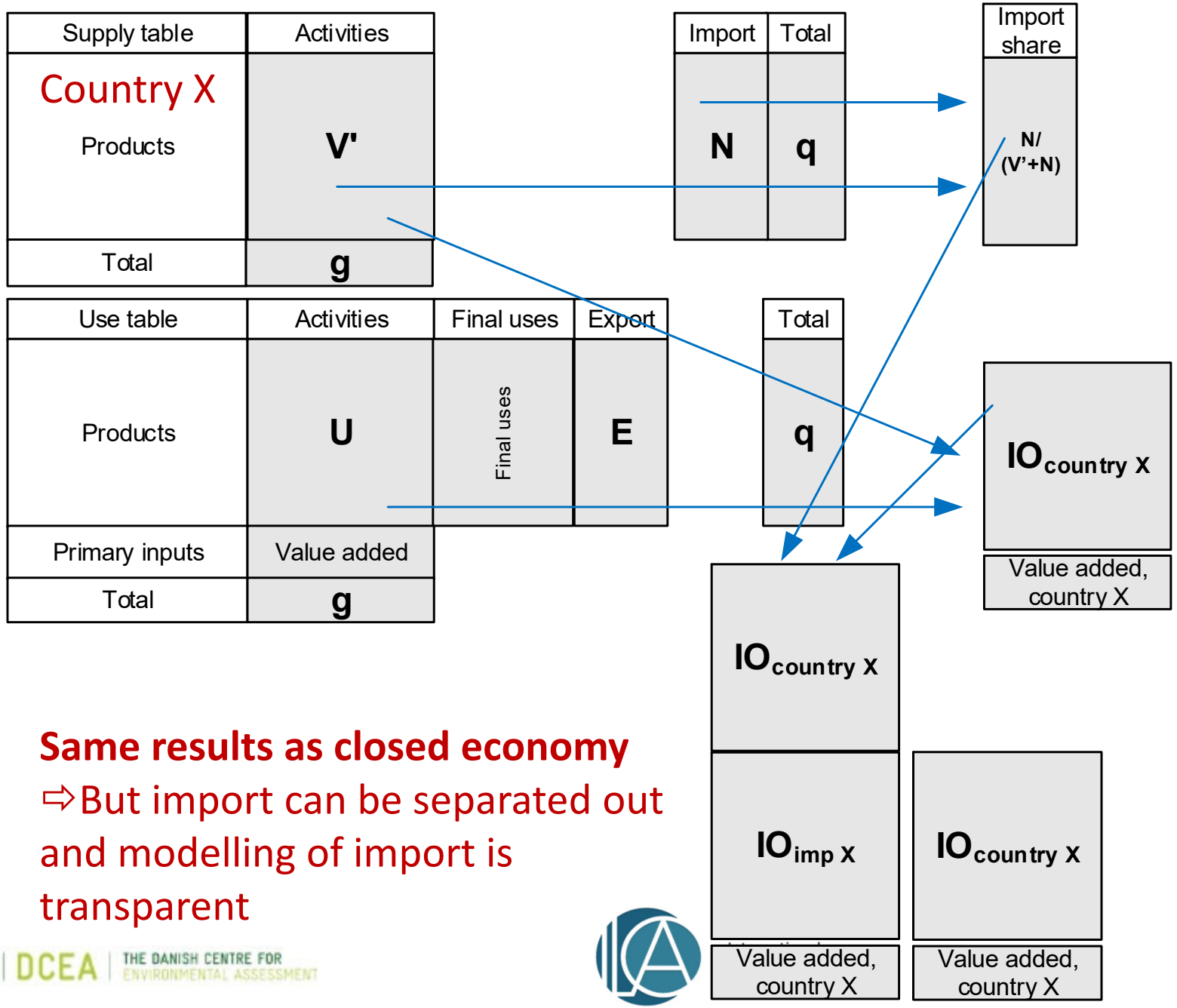
- Closed economy assumption



- Why is this this method problematic?
  - Analysing final uses do not add up to domestic flows
  - Impact per unit of product varies from country to country

Simplest solution to deal with trade

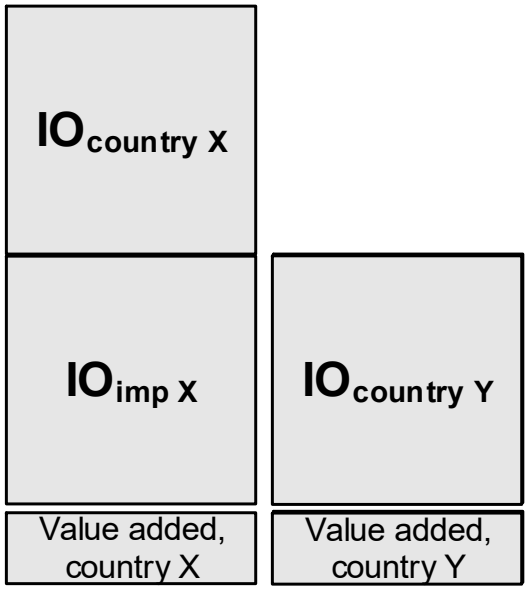
- Closed economy assumption – transparent



Same results as closed economy

⇨But import can be separated out and modelling of import is transparent

Simplest solution to include other countries
- Link import to other IO tables



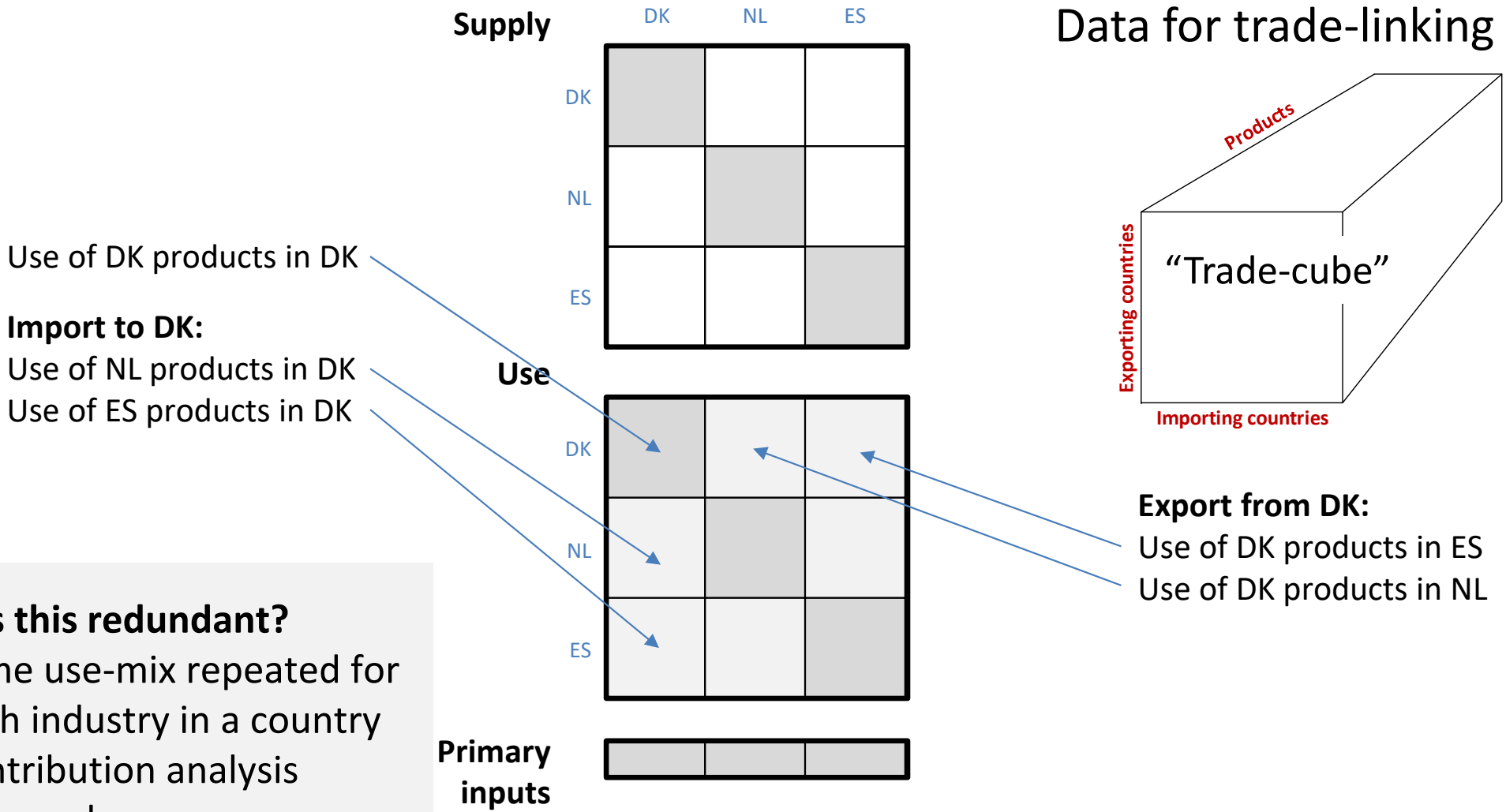
Import can be modelled from relevant countries

⇨Exporting countries modelled using a closed economy assumption

⇨No balance in trade

Fully trade-linked system

- Conventional (Simple and redundant approach)



Why is this redundant?

- Same use-mix repeated for each industry in a country
- Contribution analysis awkward

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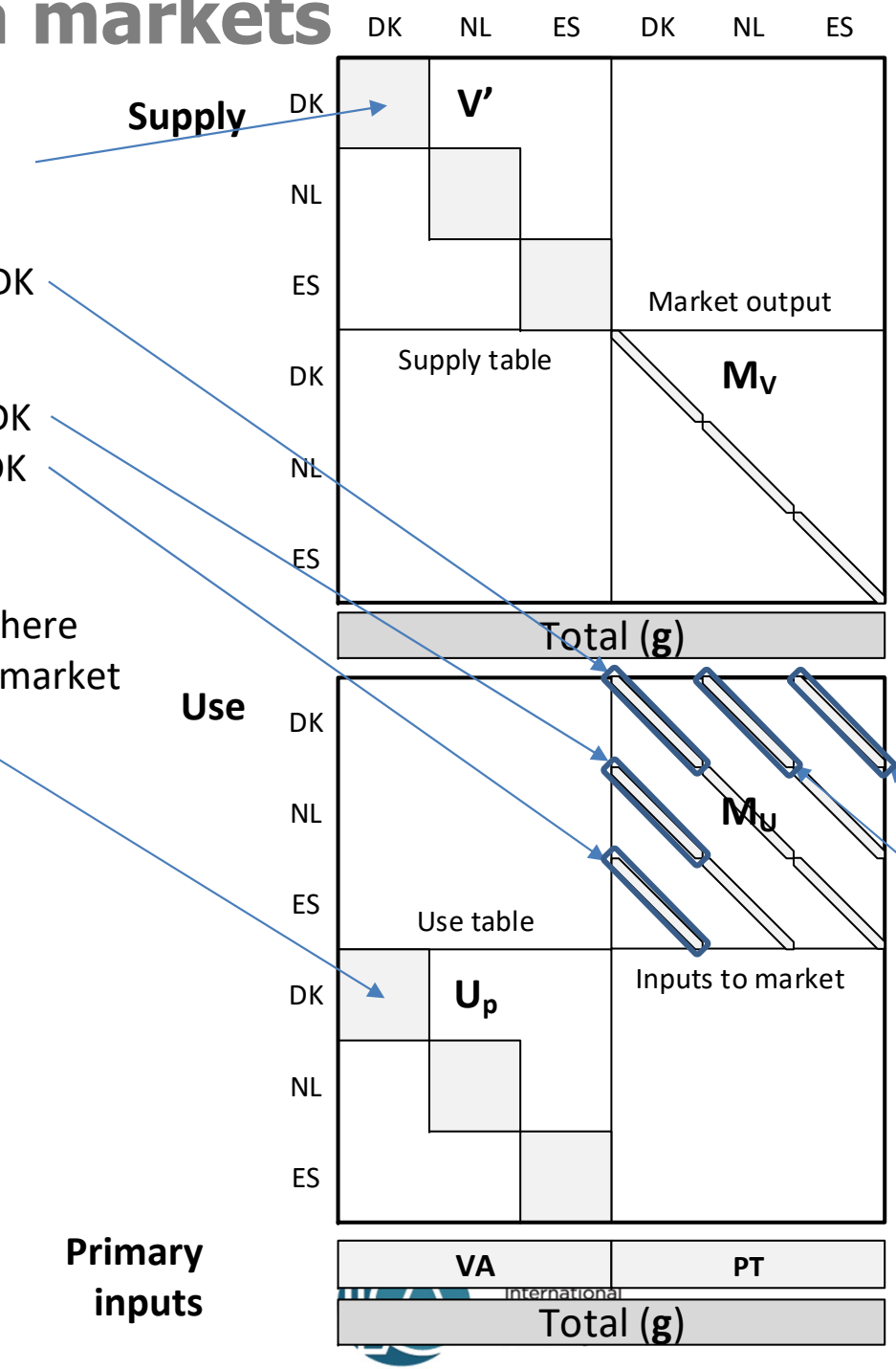
Fully trade-linked system

- Linking via markets



"Normal" supply table

Use of DK products in DK

Import to DK:
Use of NL products in DK
Use of ES products in DK

"Normal" use table, where each row is a product market

N.B. by-products are not adressed here – see next bullet on agenda

Export from DK:
Use of DK products in ES
Use of DK products in NL

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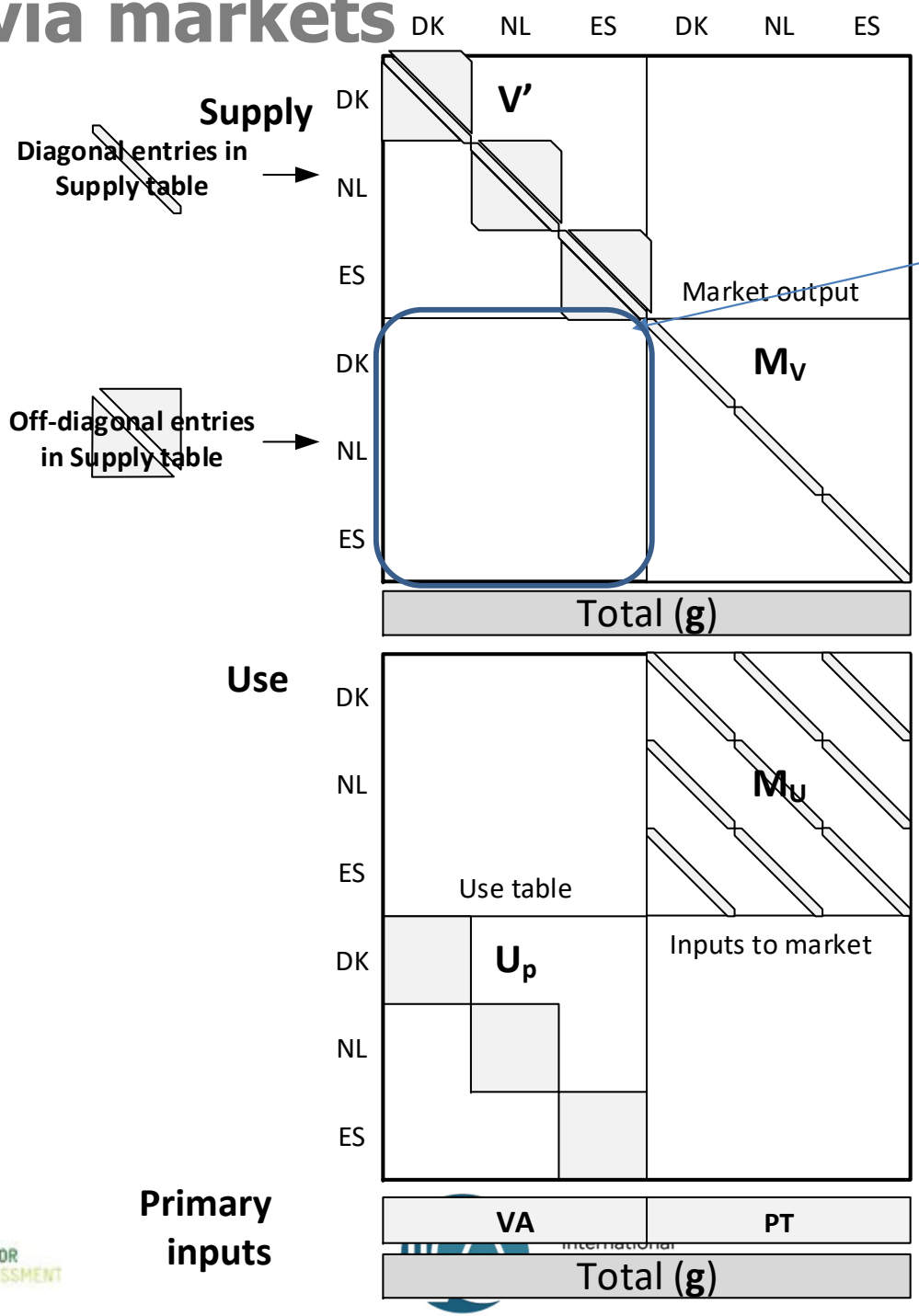

By-products:
Links to international markets