



Virtual Event 15-18 June 2020  
**2020 Asia-Pacific  
Statistics Week**

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## **Environmentally-Extended Input Output Tables – Integrated Analysis for Low Carbon Development in Indonesia**

Action Area C. Integrated statistics for integrated analysis (SC1)

### **Methodological approaches to integrated analysis: Use of sound methodologies**

Presenter:

**Zanial Fahmi Firdaus**  
**Statistics Indonesia**

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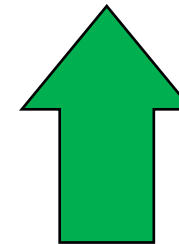
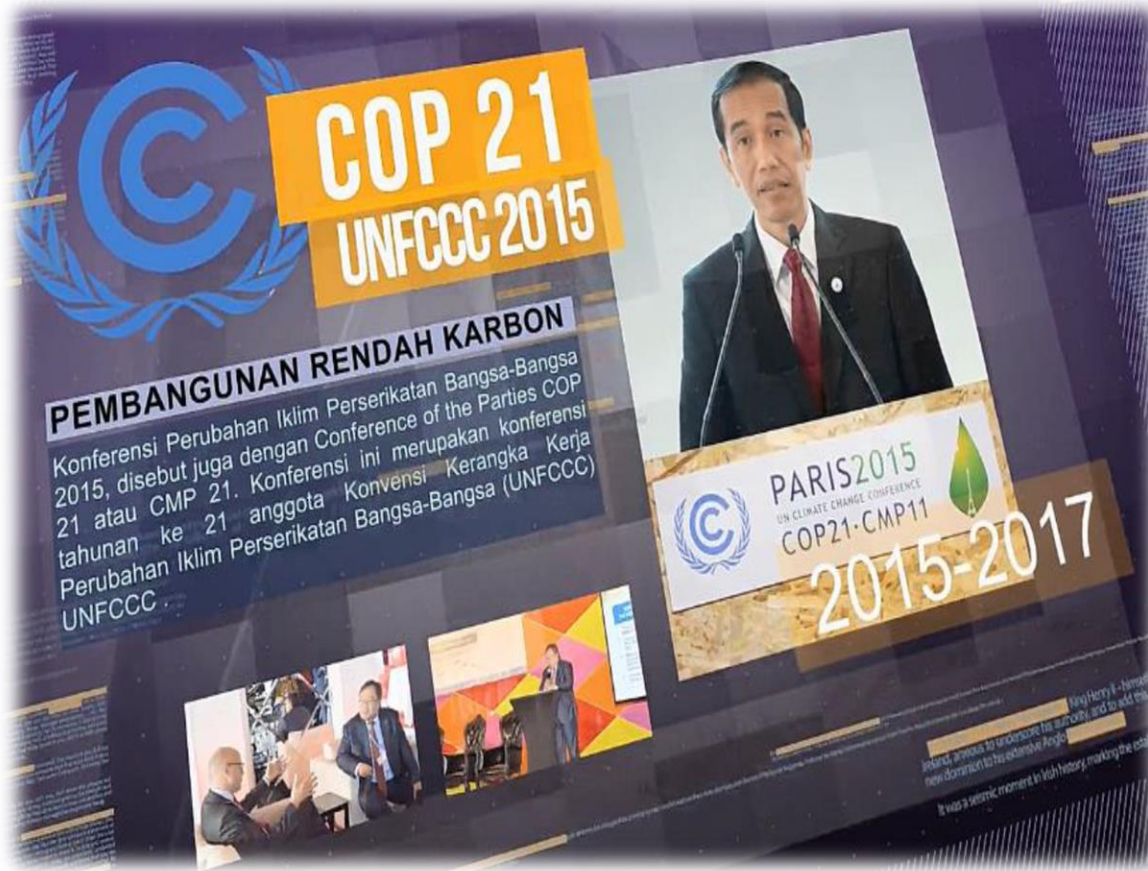


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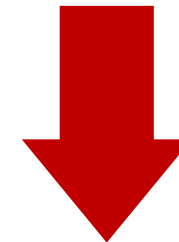
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**5,7%**

Economic Growth  
Target



**29%**

Emission Reduction  
Target

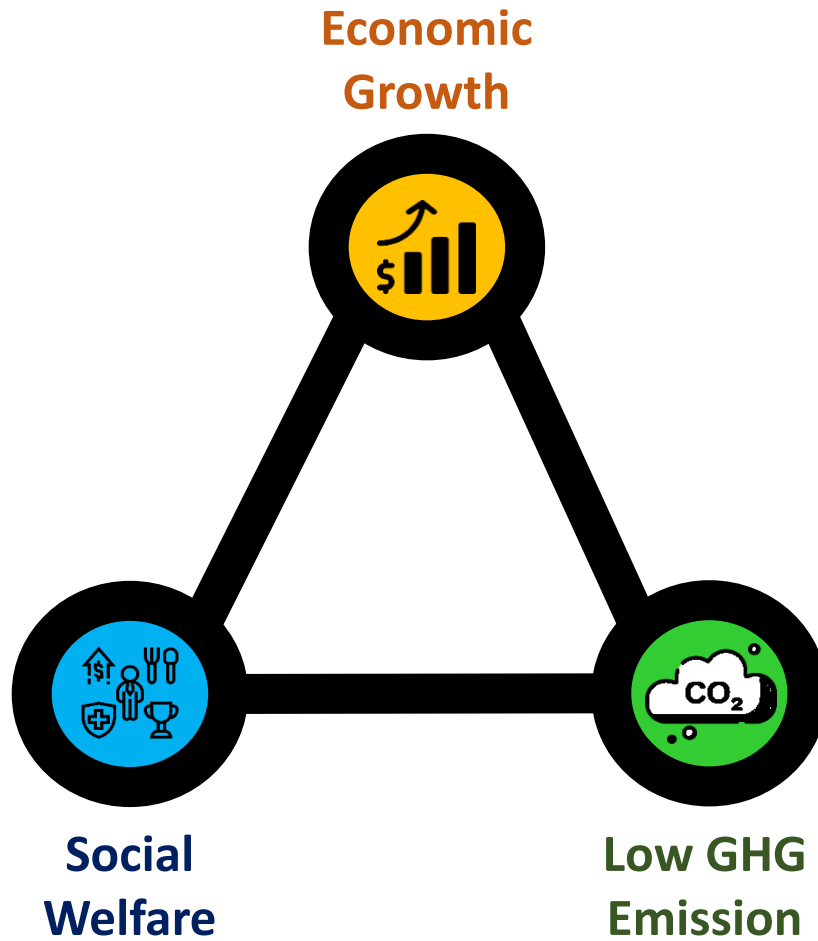




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## Low carbon development

is a paradigm of forward-looking economic development that encompasses low-emission and climate-resilient economic growth



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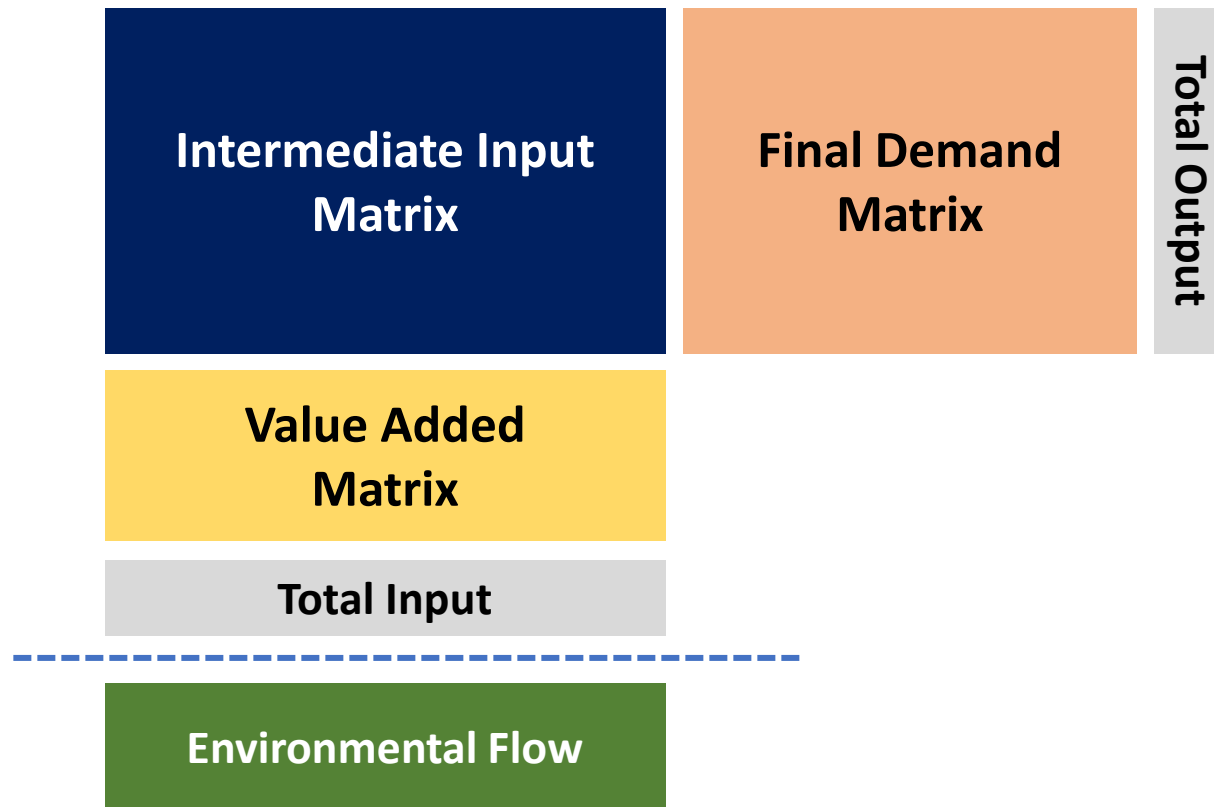


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## Environmentally-Extended Input-Output Table (EE-IOT)



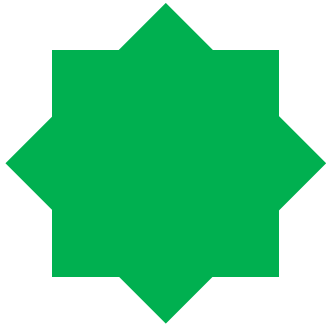
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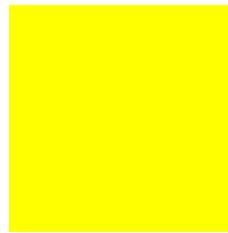
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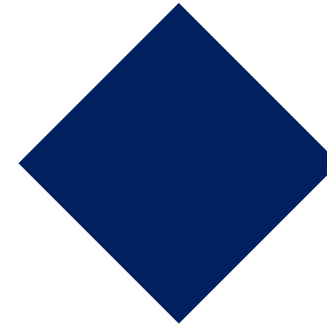
EE-IOT

=



IO Table

+



Environmental  
Accounts

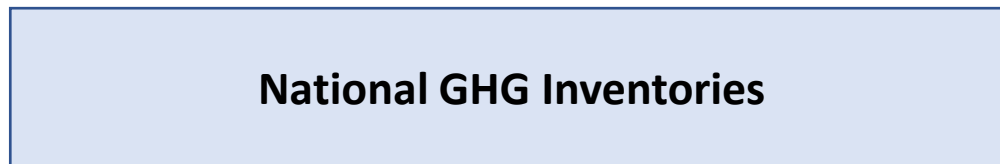
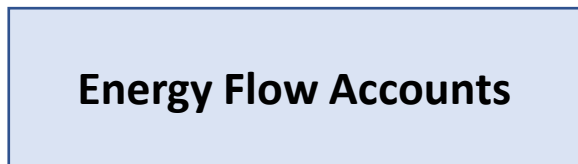
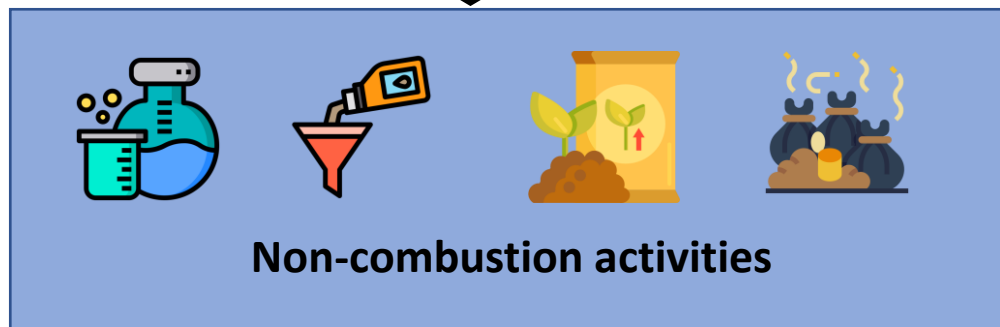


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## Air Emission Accounts





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Domain	Data	Source
ECONOMY	<ul style="list-style-type: none"> <li>Input- Output Table</li> </ul>	 Statistics Indonesia
ENERGY	<ul style="list-style-type: none"> <li>Energy Balance</li> <li>Energy Flow Accounts</li> </ul>	 International Energy Agency  Statistics Indonesia'
EMISSION	<ul style="list-style-type: none"> <li>Emission Factor</li> <li>National GHG Inventory</li> </ul>	 Intergovernmental Panel on Climate Change  Ministry of Environment and Forestry



## Analysis Methods



Multiplier Analysis



Linkage Analysis



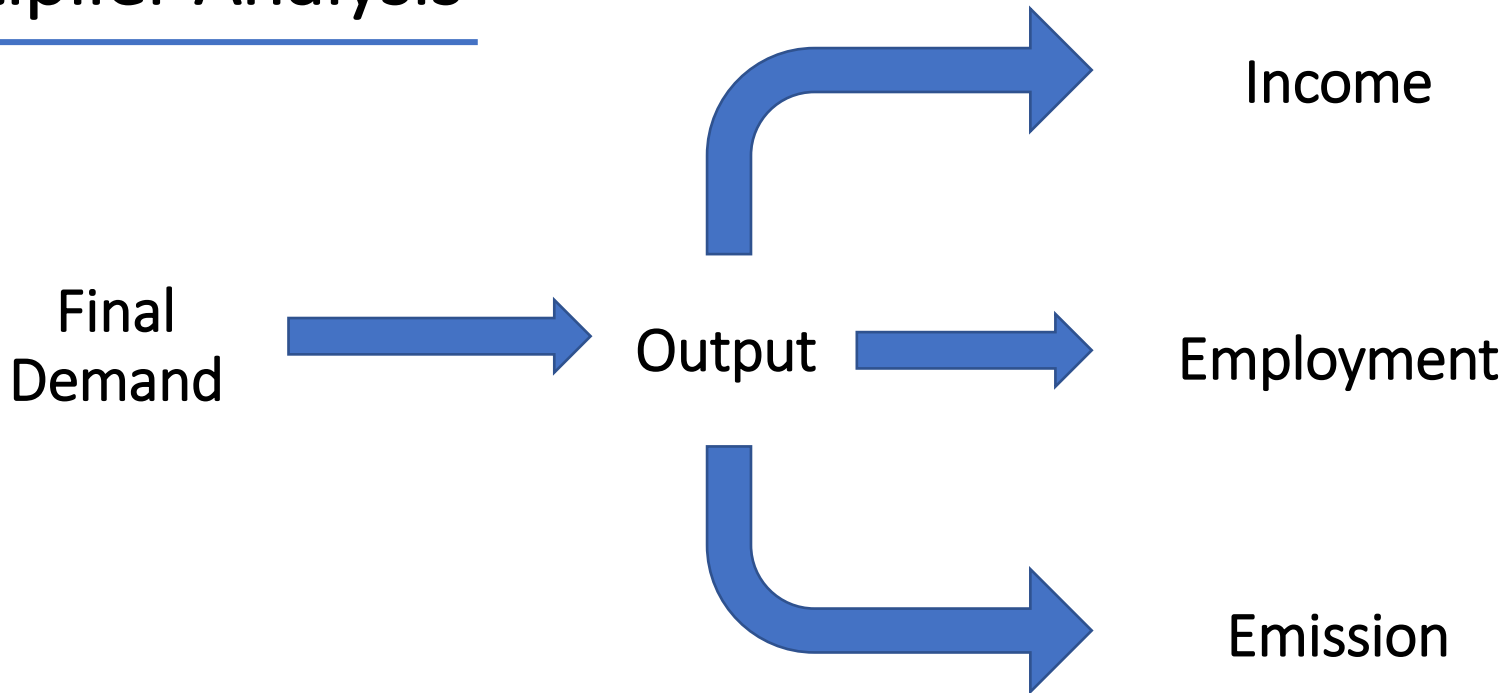


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## Multiplier Analysis



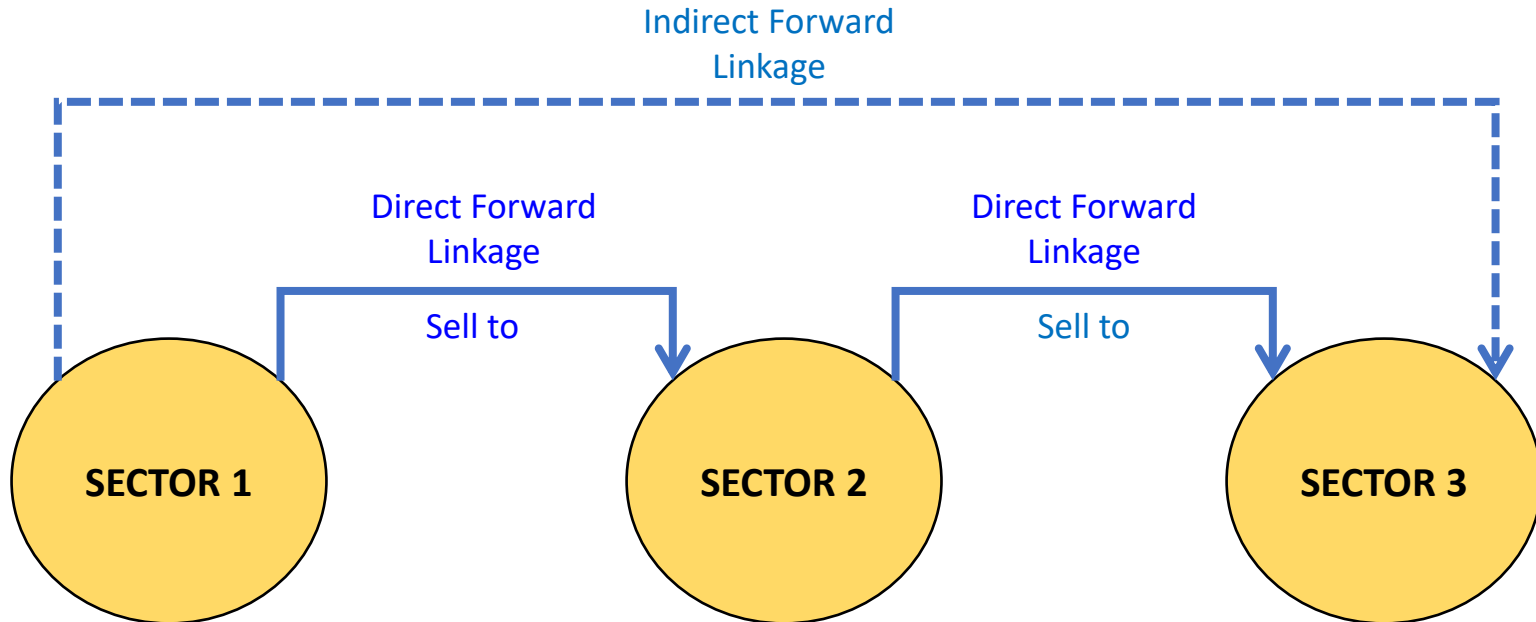


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— . — . — Forward Linkage



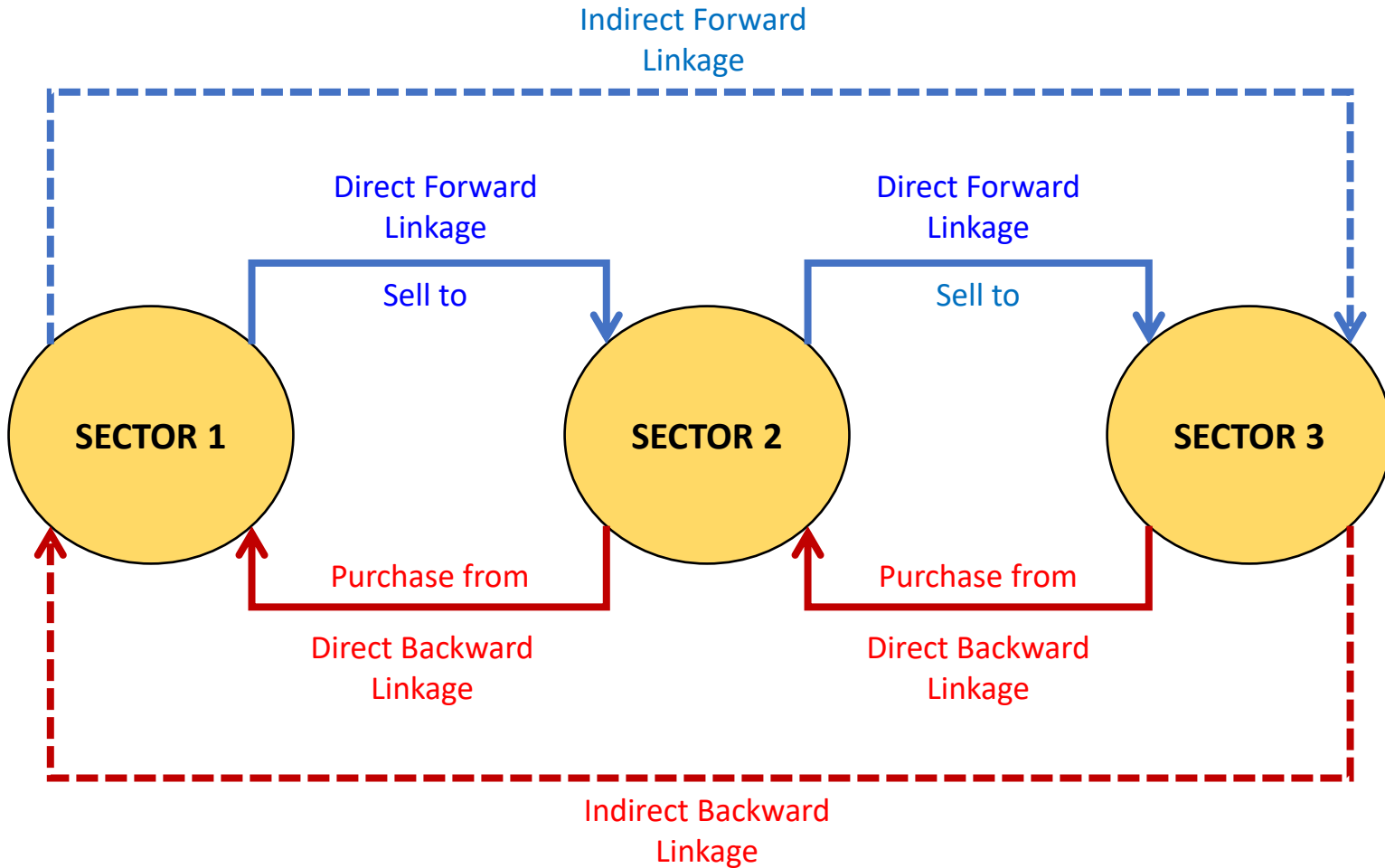


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— · — · — Forward Linkage  
- · - · - Backward Linkage





## Backward Linkage

- Calculated from Leontief Inverse Matrix
- Backward Linkage formula

$$BL_j = \sum_{i=1}^n l_{ij}$$

- Normalized Backward Linkage formula

$$NBL_j = \sum_{i=1}^n l_{ij} / \frac{1}{n} \sum_{i=1}^n \sum_{j=1}^n l_{ij}$$

## Forward Linkage

- Calculated from Ghosh Inverse Matrix
- Forward Linkage formula

$$FL_i = \sum_{j=1}^n g_{ij}$$

- Normalized Forward Linkage formula

$$NFL_i = \sum_{j=1}^n g_{ij} / \frac{1}{n} \sum_{i=1}^n \sum_{j=1}^n g_{ij}$$



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NBL

**KEY ECONOMIC SECTORS**

**$NBL > 1$**

**$NFL > 1$**

NFL

1

1



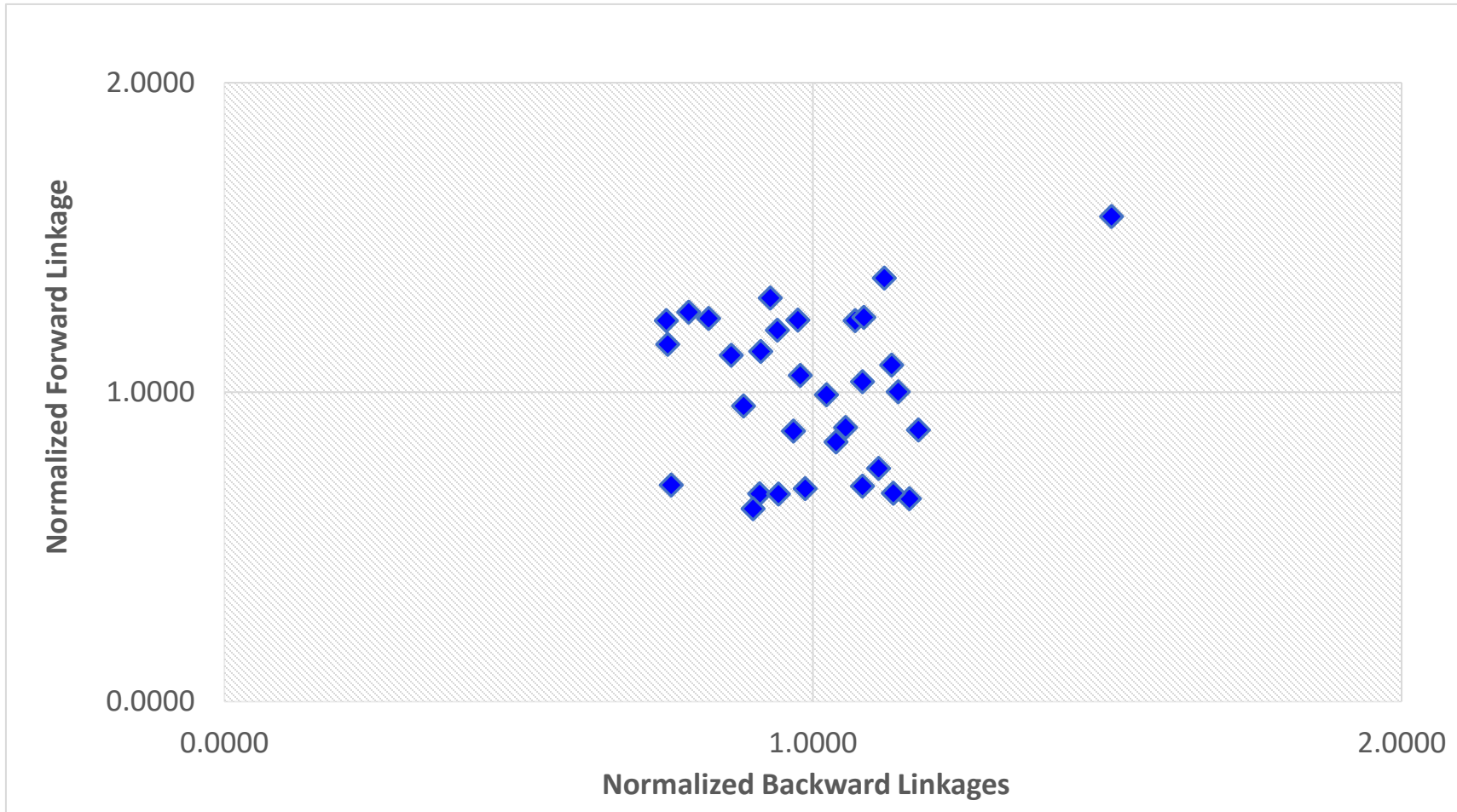
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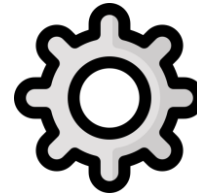
# Results: Key Economic Sectors



Electricity and  
gas supply



Manufacture of  
rubber and  
plastics products



Manufacture of  
basic metals



Manufacture of  
other non-metallic  
mineral products



Manufacture of  
paper, paper  
products, printing and  
reproduction of  
recorded media










Other manufacturing,  
repair and installation  
of machinery  
equipment



Manufacture of wood and  
of products of wood and  
cork, except furniture;  
manufacture of articles of  
straw and plaiting materials



# Results: Key Economic Sectors

Sectors							
Output multiplier	2.56	1.94	1.92	1.90	1.84	1.84	1.82
CO <sub>2</sub> emission multiplier	0.81	0.05	0.12	0.06	0.28	0.06	0.13



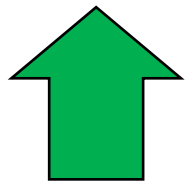


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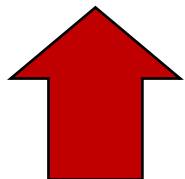


### Electricity and gas supply



**2.56**

Output Multiplier

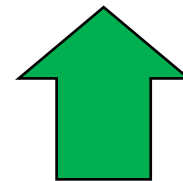


**0.80**

CO2 Emission Multiplier

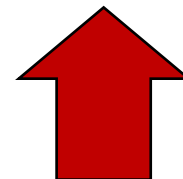


### Manufacture of rubber and plastics products



**1.94**

Output Multiplier



**0.05**

CO2 Emission Multiplier



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# Conclusion



- The EE-IOT provides an integrated framework to analyze the interconnection between economic sectors and environmental flows.
- The EE-IOT enables the policy-makers to consider the trade-offs between economic growth and environmental degradation



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## Environmental Flows



GHG Emission



Water Use



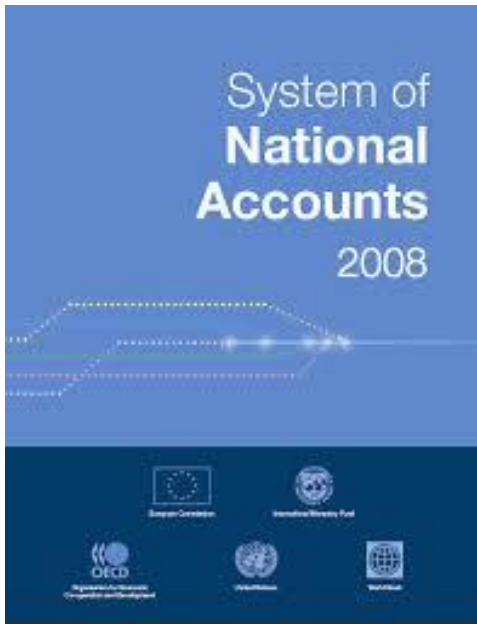
Energy Use



Waste  
Generation



# integrated framework for integrated analysis



System of National Accounts

System of Environmental-Economic Accounting



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# THANK YOU



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