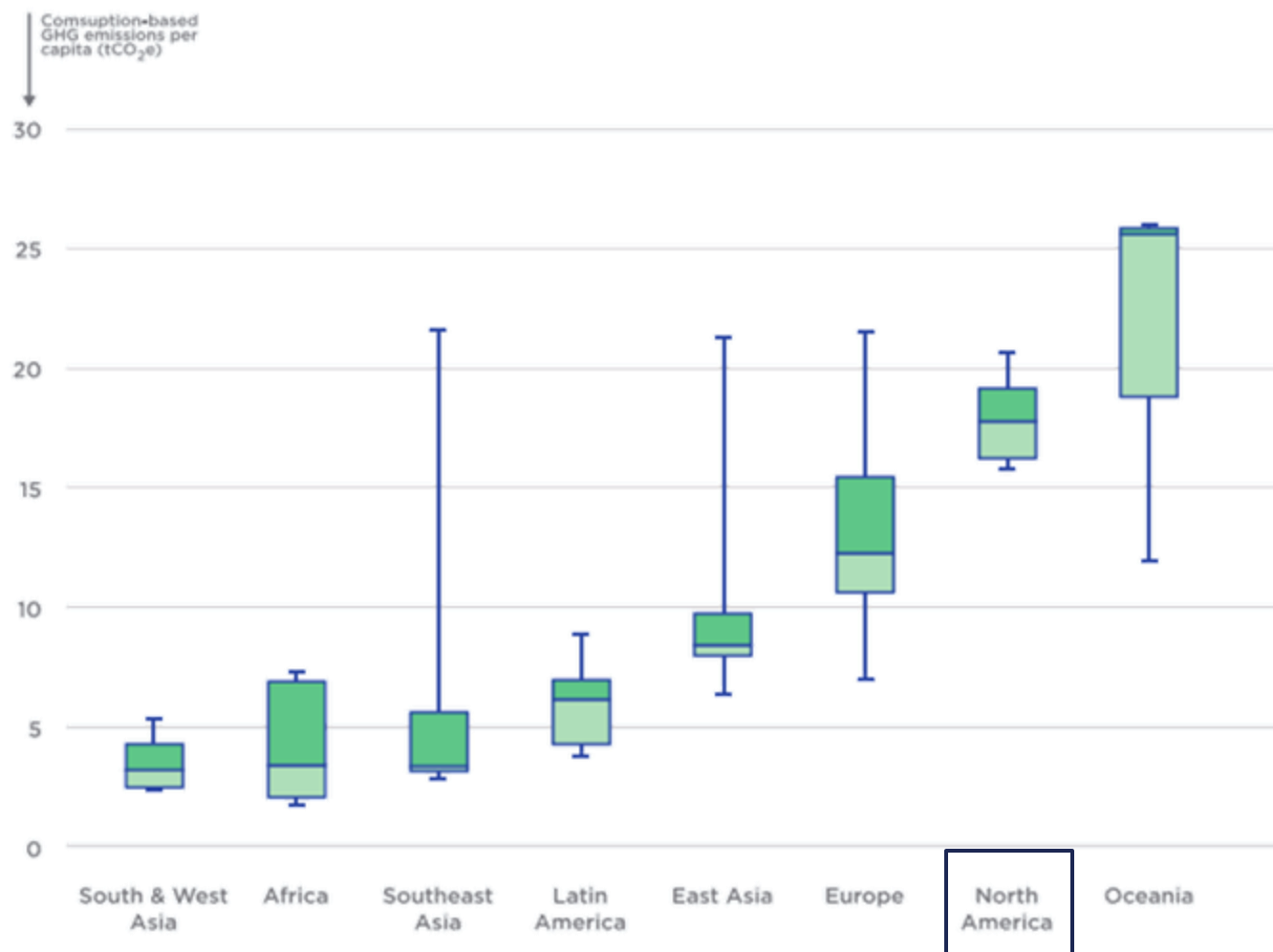




Consumption-Based Emissions Inventories (CBEI)

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NERC's Rethinking Resource Use 2025 Conference



**NORTH AMERICAN
CITIES HAVE HIGH
PER CAPITA
CONSUMPTION-BASED
GHG EMISSIONS**

Connecting Consumption, Emissions & Waste

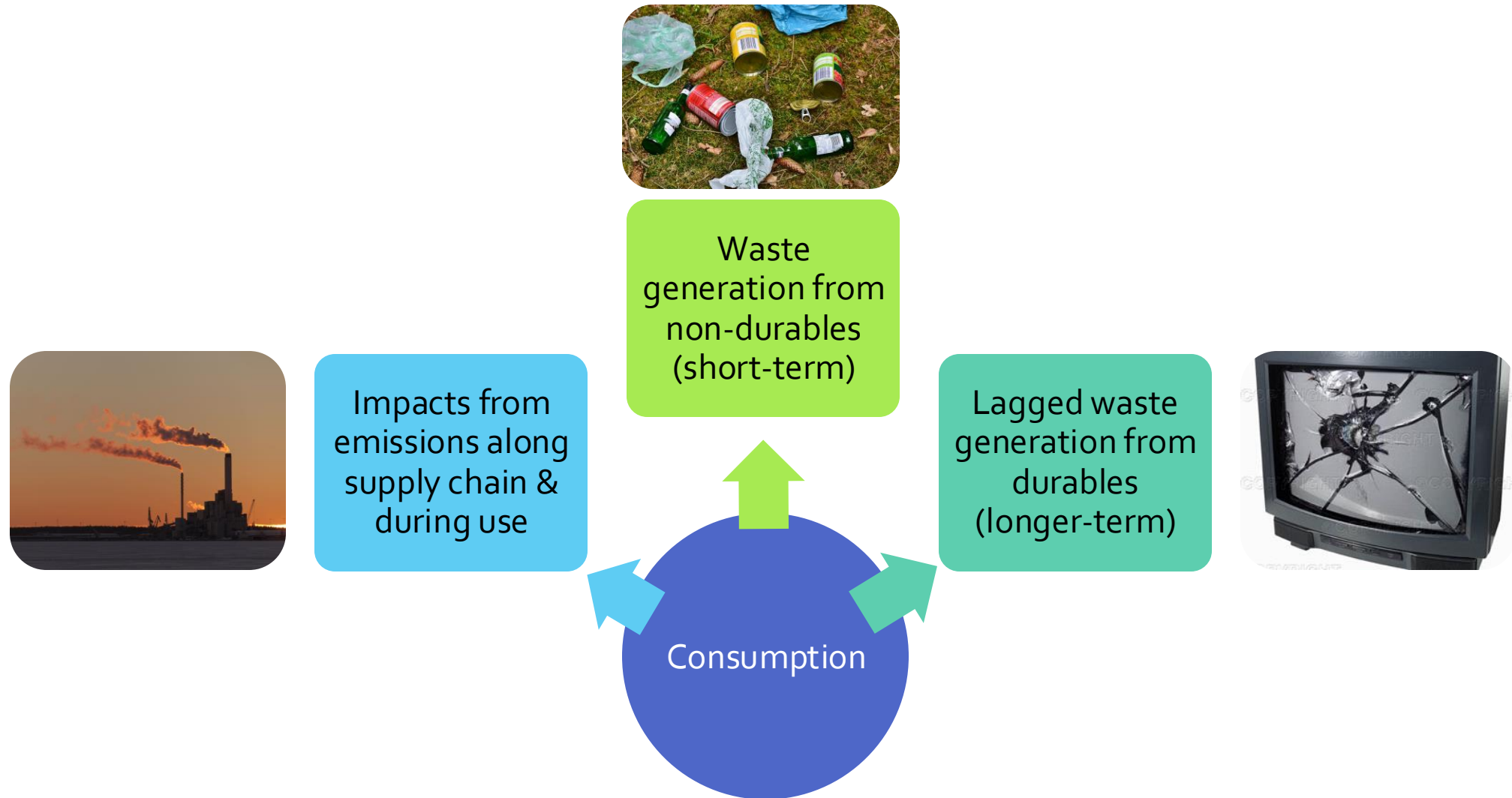
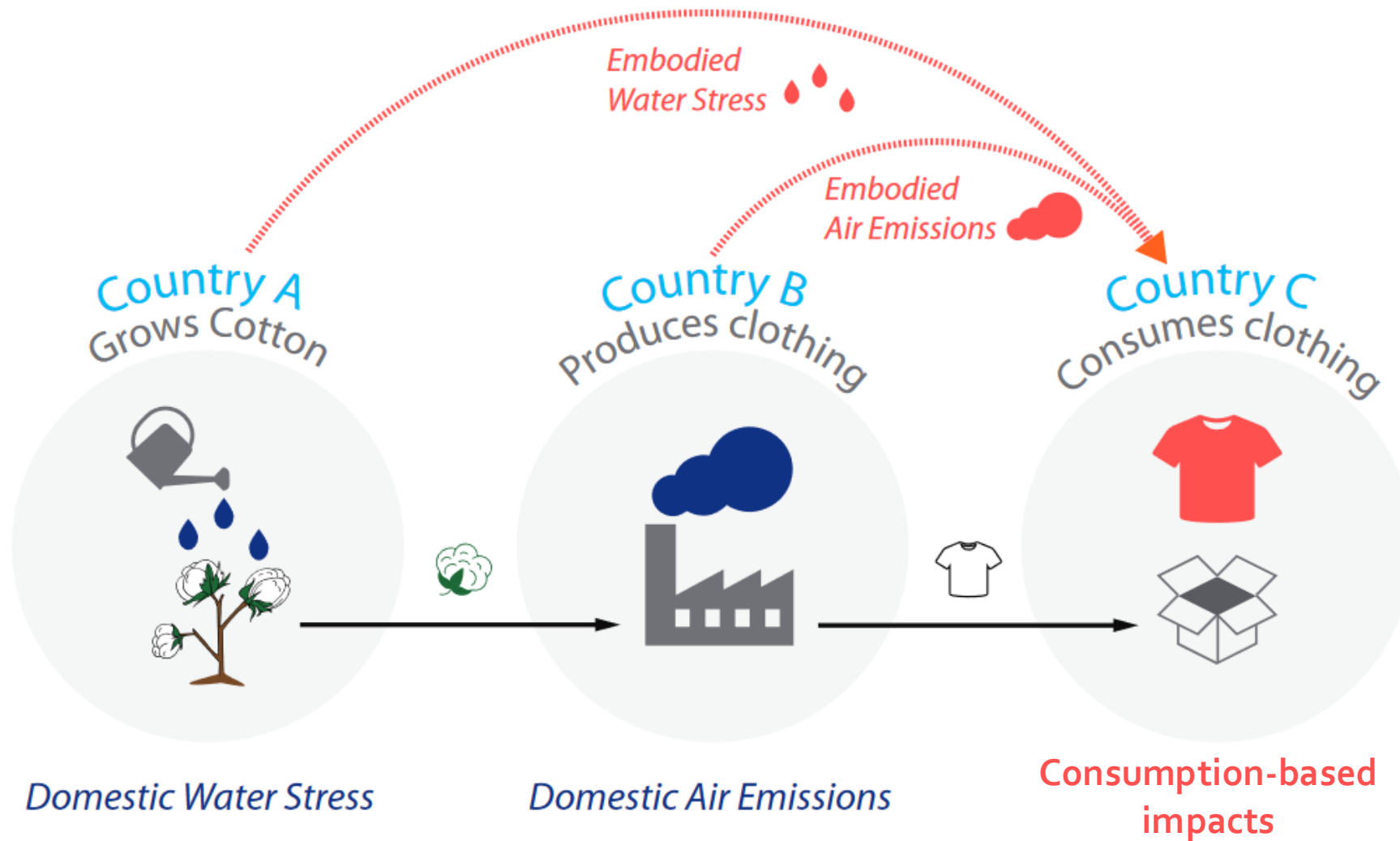


Illustration of environmental impacts embodied in international trade

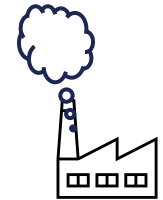


Comparing Types of Emissions Inventories

Consumption-Based includes:



Domestic emissions from products we **use**



Domestic emissions from products we **make and buy**



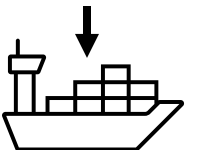
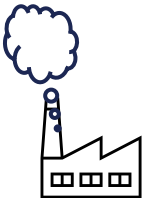
Imported emissions along the supply chain from products we buy

Territorial includes:

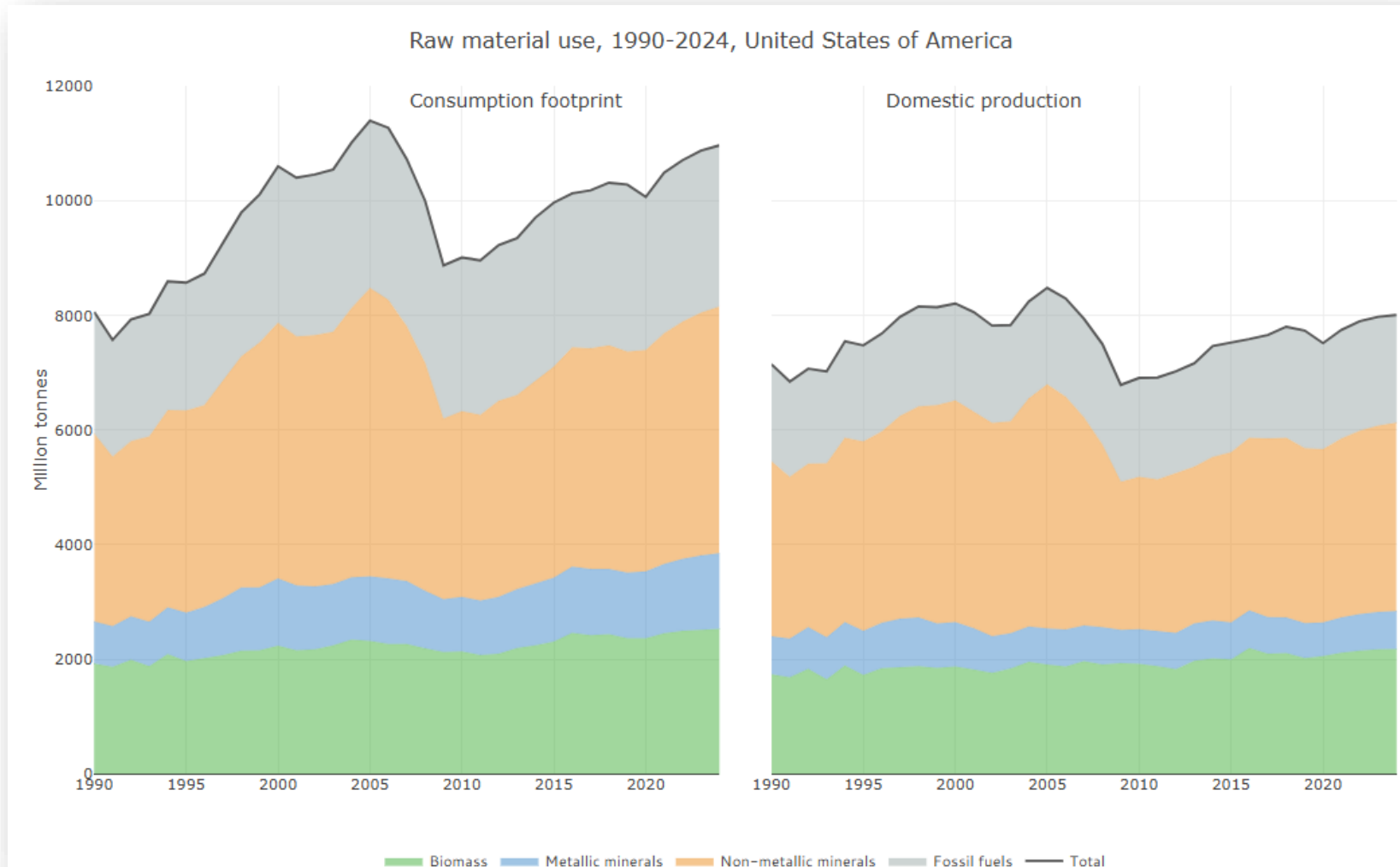
Domestic emissions from products we **use**

Domestic emissions from products we **make and buy**

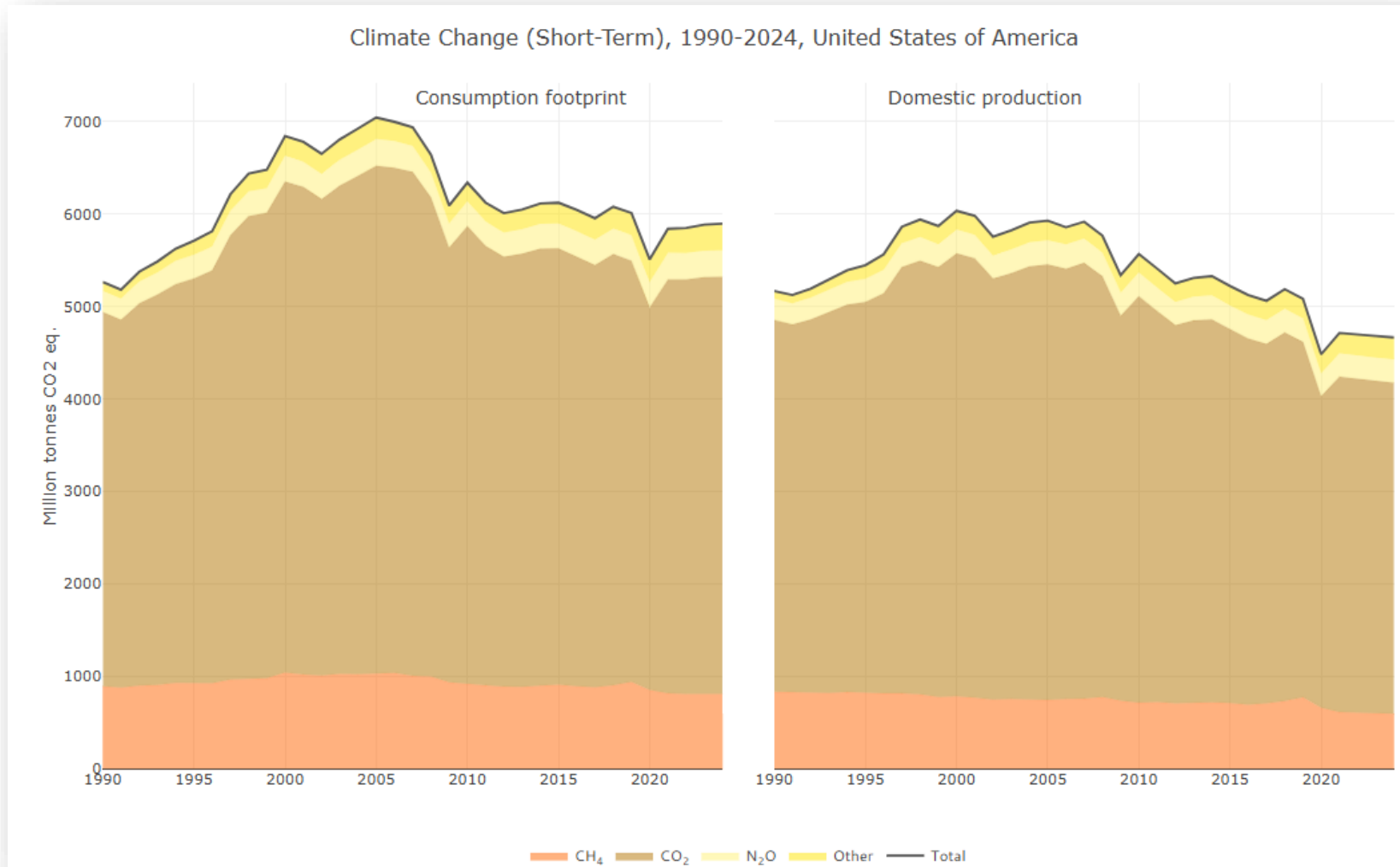
Domestic emissions from products we **make and export**



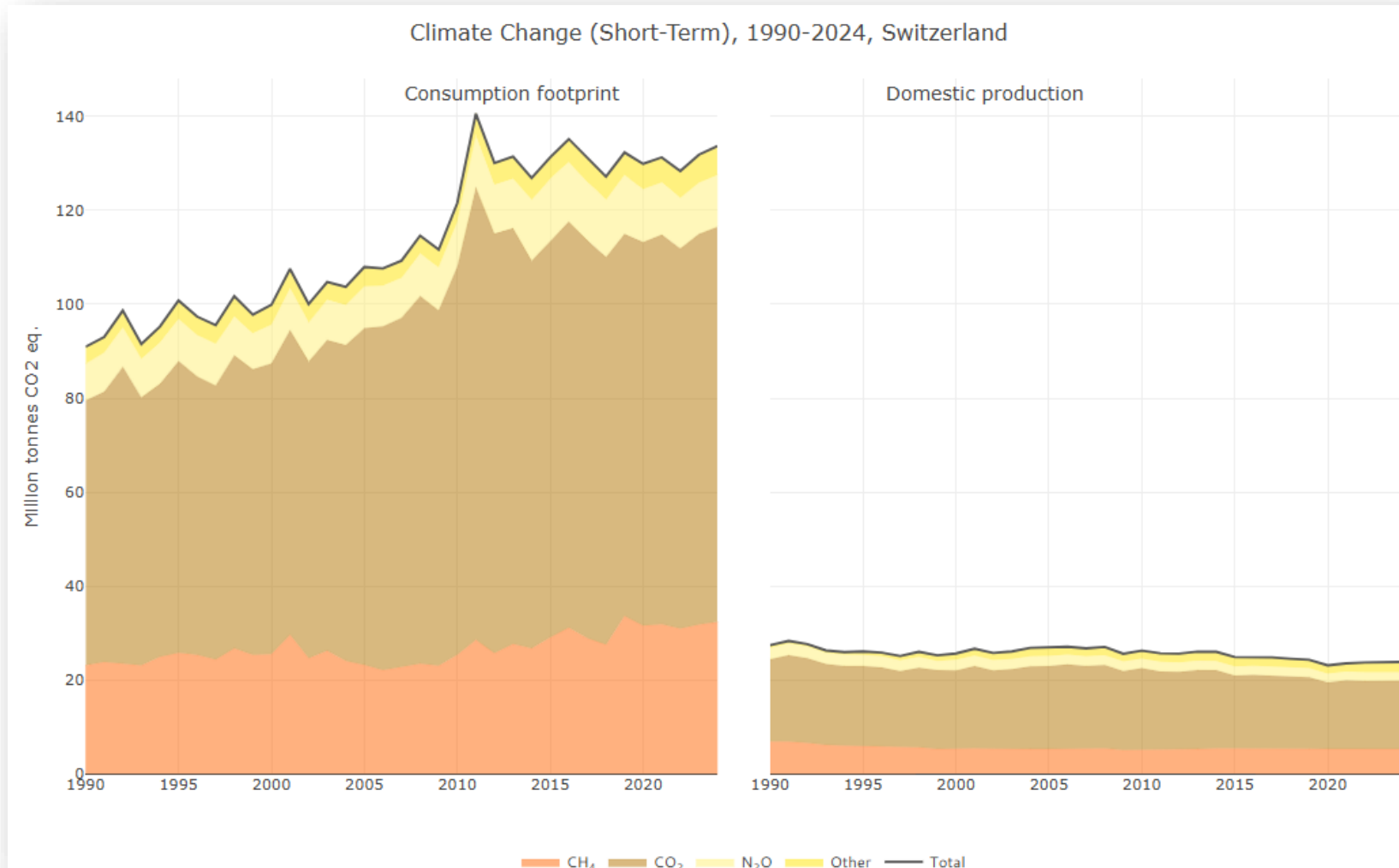
US raw material footprint: consumption > territorial



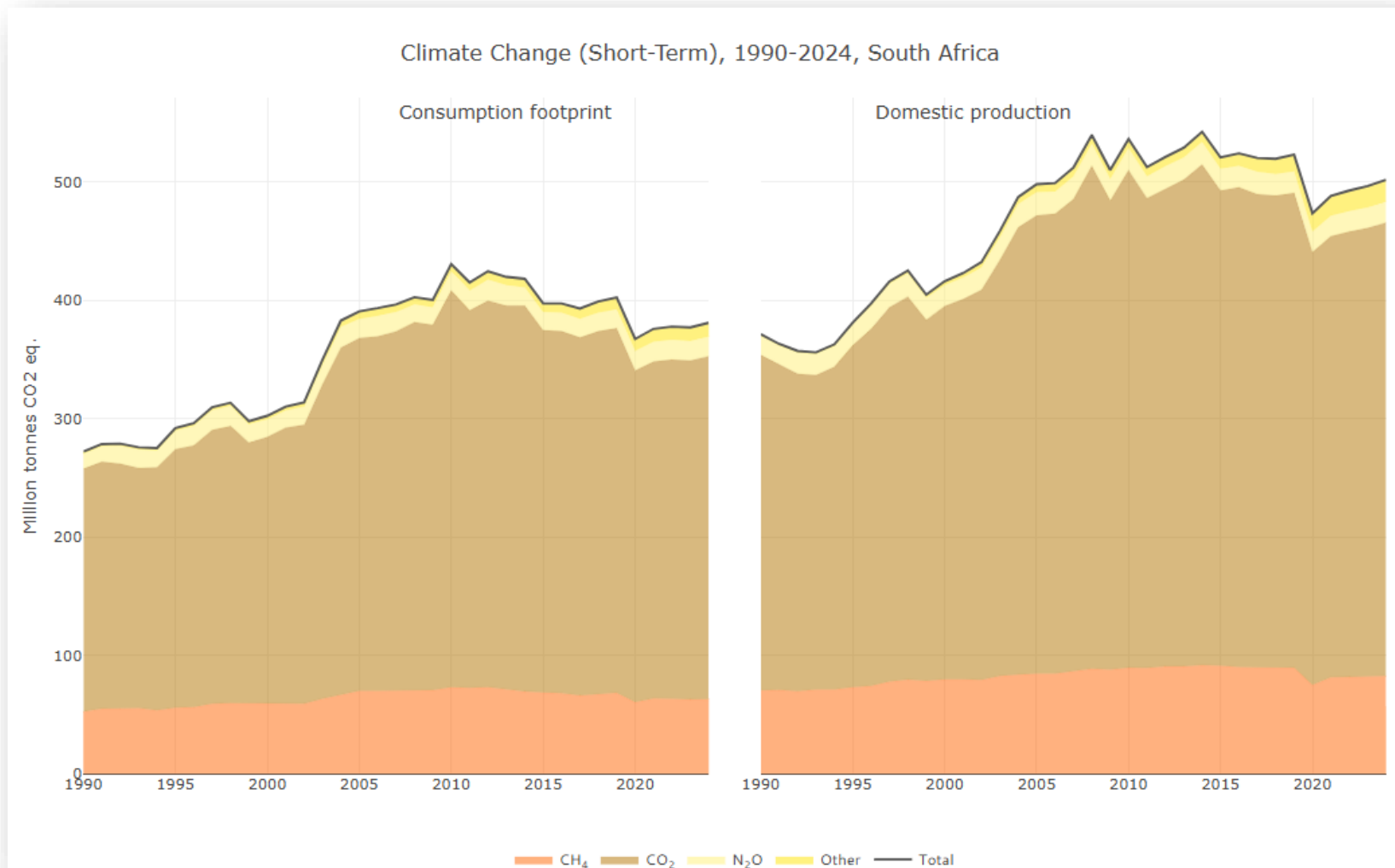
US climate change footprint: consumption > territorial



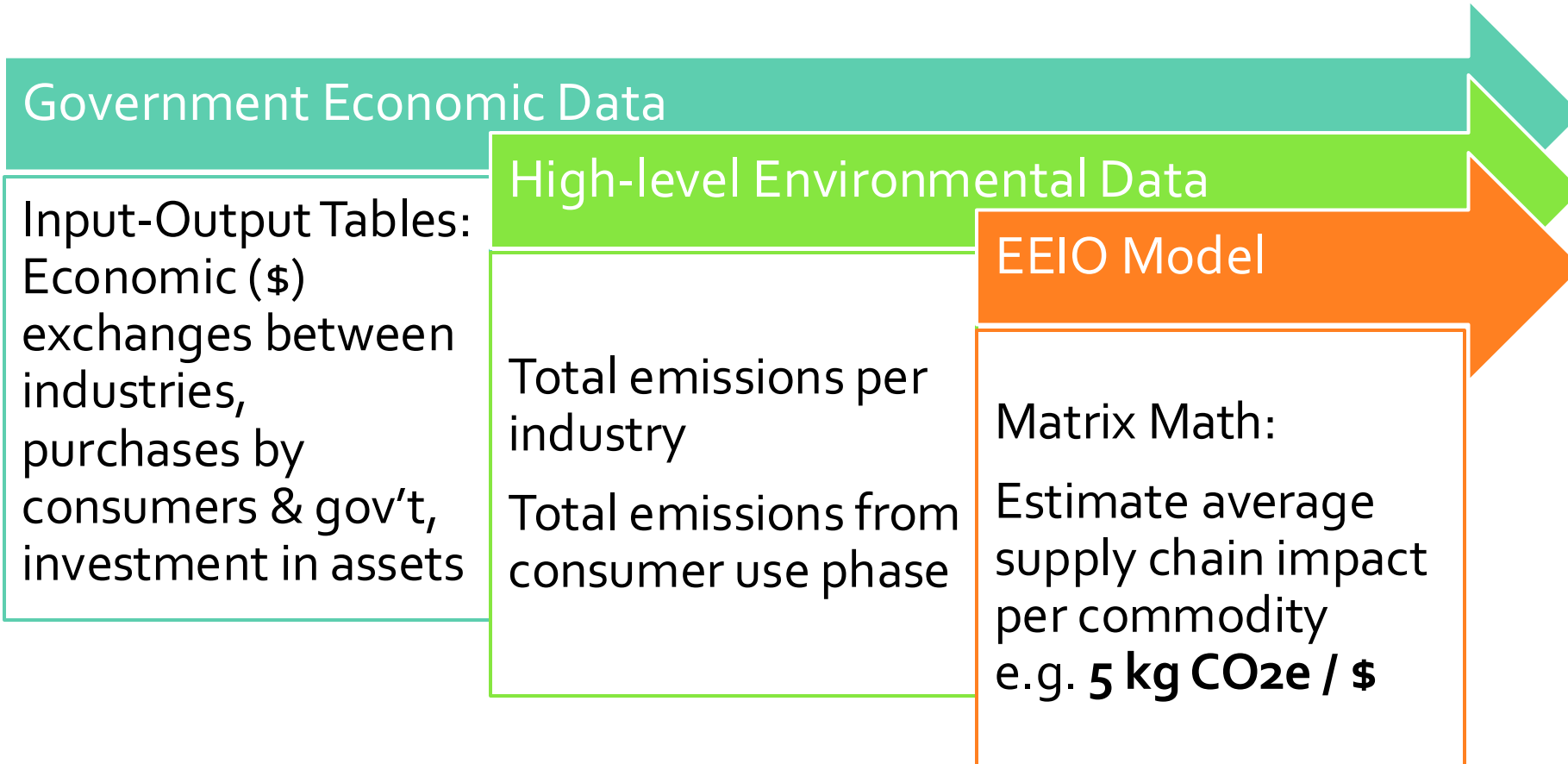
Switzerland climate change footprint: consumption >>> territorial



South Africa's climate change footprint: consumption < territorial



How are CBEI estimates calculated?



Environmentally-Extended Input Output (EEIO)

...are the
“inputs”
to these
sectors:

Sectors using products				
A. Raw Material	B. Energy	C. Transport	D. Products	E. Services

Final Demand		
Final Consumption	Investment	
	Equipment	Structures
		Intellectual Property

The
“outputs”
of these
sectors...

Sectors making products	A. Raw Material
	B. Energy
	C. Transport
	D. Products
	E. Services

Inter-industry
purchases of
goods & services
used within a year



Final Demand of
goods & services

...which emit:



Environmentally-Extended Input Output (EEIO)

...are the
“inputs”
to these
sectors:

Sectors using products				
A. Raw Material	B. Energy	C. Transport	D. Products	E. Services

Final Demand		
Final Consumption	Investment	
	Equipment	Structures
		Intellectual Property

The
“outputs”
of these
sectors...

Sectors making products	A. Raw Material
	B. Energy
	C. Transport
	D. Products
	E. Services

A → A	A → B	A → C	A → D	A → E
B → A	B → B	B → C	B → D	B → E
C → A	C → B	C → C	C → D	C → E
D → A	D → B	D → C	D → D	D → E
E → A	E → B	E → C	E → D	E → E

A → FC	A → IE	A → IS	A → IIP
B → FC	B → IE	B → IS	B → IIP
C → FC	C → IE	C → IS	C → IIP
D → FC	D → IE	D → IS	D → IIP
E → FC	E → IE	E → IS	E → IIP

...which emit:



Environmentally-Extended Input Output (EEIO)

Sectors using products				
A. Raw Material	B. Energy	C. Transport	D. Products	E. Services

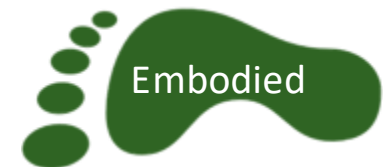
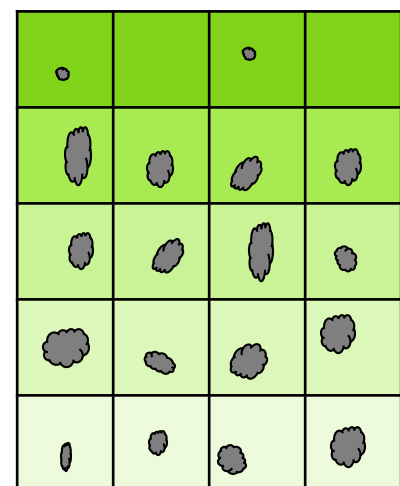
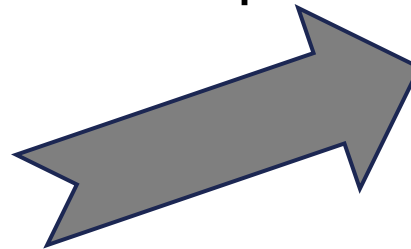
Final Demand		
Final Consumption	Investment	
	Equipment	Structures
		Intellectual Property

Sectors making products	A. Raw Material
	B. Energy
	C. Transport
	D. Products
	E. Services

A→A	A→B	A→C	A→D	A→E
B→A	B→B	B→C	B→D	B→E
C→A	C→B	C→C	C→D	C→E
D→A	D→B	D→C	D→D	D→E
E→A	E→B	E→C	E→D	E→E



Calculate
embodied
emission
footprints

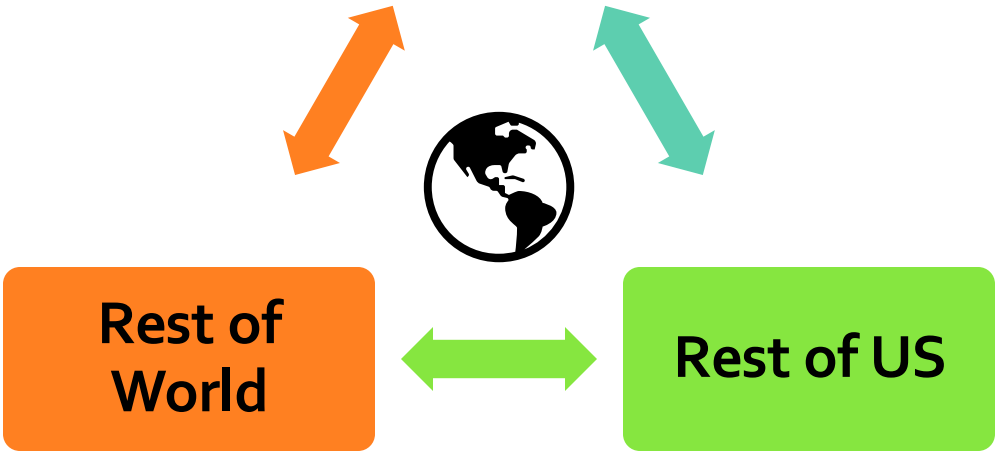


Connect multiple regions together through trade

A→A	A→B	A→C	A→D	A→E
B→A	B→B	B→C	B→D	B→E
C→A	C→B	C→C	C→D	C→E
D→A	D→B	D→C	D→D	D→E
E→A	E→B	E→C	E→D	E→E
				

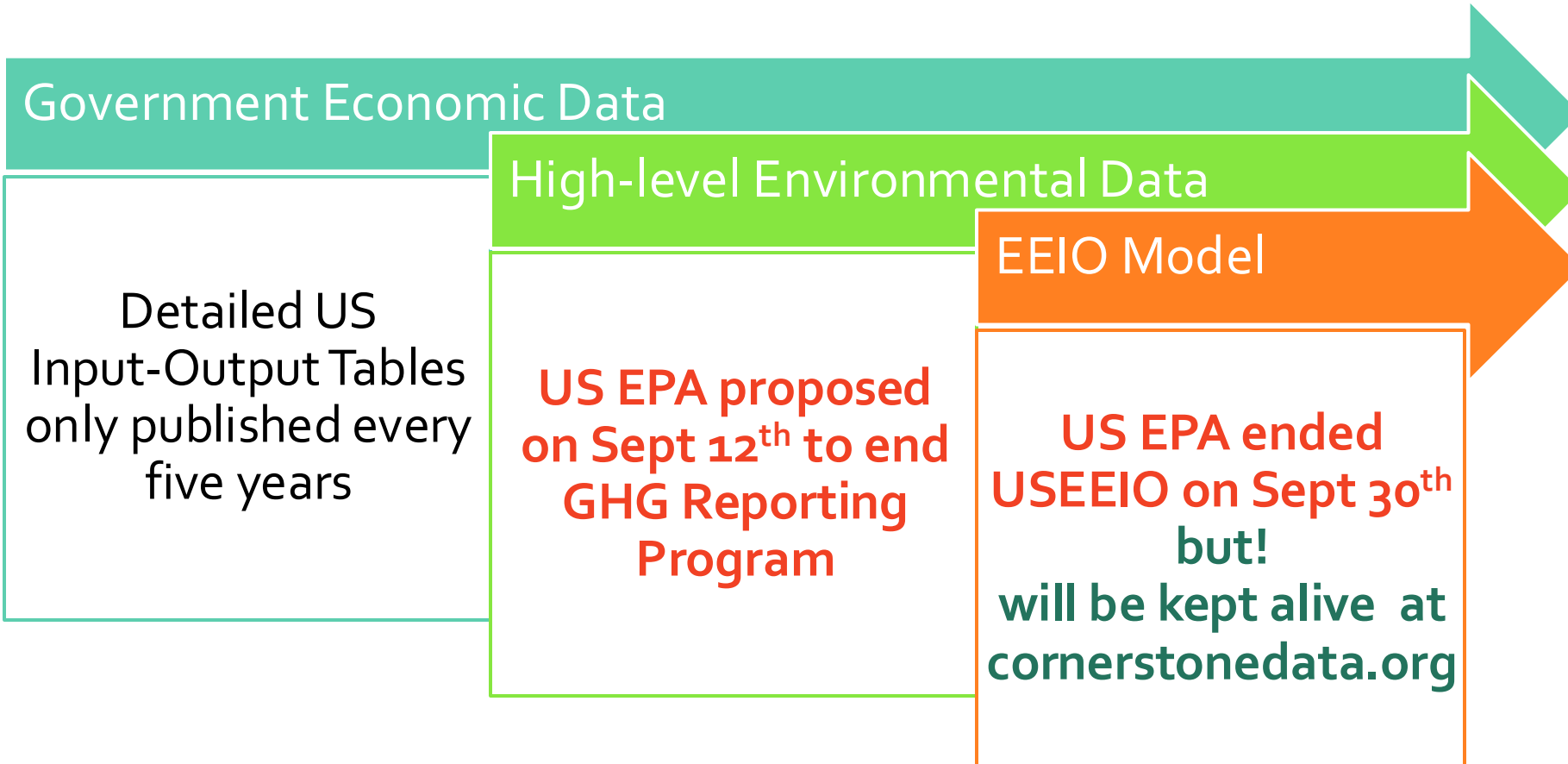
Maine

A→A	A→B	A→C	A→D	A→E
B→A	B→B	B→C	B→D	B→E
C→A	C→B	C→C	C→D	C→E
D→A	D→B	D→C	D→D	D→E
E→A	E→B	E→C	E→D	E→E
				



A→A	A→B	A→C	A→D	A→E
B→A	B→B	B→C	B→D	B→E
C→A	C→B	C→C	C→D	C→E
D→A	D→B	D→C	D→D	D→E
E→A	E→B	E→C	E→D	E→E
				

CBEI Current Challenges





Thank You!

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