



The employment intensity of carbon:

A SAM-based approach for Cameroon

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GTAP 25th Annual Conference on Global Economic Analysis
"Accelerating Economic Transformation, Diversification and Job Creation"
¹June 8-10, 2022.

Outline

- Objectives
- Database: SAM for Cameroon and satellites accounts
- Methodology
- Country context
- Results

Objectives

- Presentation of the indicator: **Employment intensity of carbon**
The indicator represents a measure of efficiency useful to determine the sensitivity of different regions and sectors to mitigation-driven changes in consumption expenditure along the global supply chain.
- Policy implications in view of the potential emissions reduction target presented in the latest Nationally Determined Contribution.

Database: SAM for Cameroon and satellites accounts

- Sources:
 - National Accounts
 - Surveys:
 - Fourth Cameroonian Household Survey (2014)
 - Supplementary Survey to the Fourth Cameroon Household Survey (2016)
 - Second Survey on Employment and the Informal Sector (2010)
 - Emissions: GTAP-E and non CO2 database
- Main characteristics:
 - Employment divided by informal/formal, skill levels and regions.
 - Emissions by type of source.

Database:

Table 1. Level of disaggregation.

Primary sector	4	Utilities	2
	Agricultural products		Electricity and energy supports
	Livestock and hunting products		Collection processing and delivery service
	Forestry and logging products	Construction	1
	Fishery and aquaculture products	Services	15
Energy and mining	2		Wholesale and retail
Food industry	8		Repairs and maintenance of vehicles and motorcycles
	Meat and meat industry products		Transport and storage
	Products of the work of grains and products		Accommodation and food services
	Cocoa coffee tea and sugar products		Information and communication services
	Oilseeds and animal feed		Financial and insurance services
	Bread Cookies and Pasta		Real estate services
	Dairy products fruit products		Professional scientific and tec services
	Drinks		Rental services travel agencies and
	Tobacco products		Public administration and security services
Manufactured	14		Education
	Textile and clothing industry products		Health and social work services
	Worked leather travel items and footwear		Artistic sports and recreational services
	Woodworking products and wooden wares		Other Services n.e.c.
	Paper and cardboard edited and printed products		Domestic services
	Products of refining coking		
	Chemical products		
	Rubber and plastic products		
	Other non-metallic mineral products		
	Basic metal products and articles of metal		
	Machinery electrical appliances and materials		
	Audio-visual and comm.		
	Transportation equipment		
	Furniture products of various industries		
	Repair and installation of machinery and eq.		
	Other Services n.e.c.		
	Domestic services		

Methodology

- Multipliers matrix: $\mathbf{M} = [\mathbf{I} - \mathbf{S}]^{-1}$
- Employment multiplier:
 - *Provides the number of jobs generated by an exogenous shock in final demand.*
 - $\mathbf{e}[\mathbf{I} - \mathbf{S}]^{-1} \bar{\mathbf{f}}$
- Emissions multiplier:
 - *Indicates how much CO₂ is created by an additional unit of final demand.*
 - $\mathbf{g}[\mathbf{I} - \mathbf{S}]^{-1} \bar{\mathbf{f}}$

Country context

Figure 1. Sector shares in Cameroon's value added 2016.

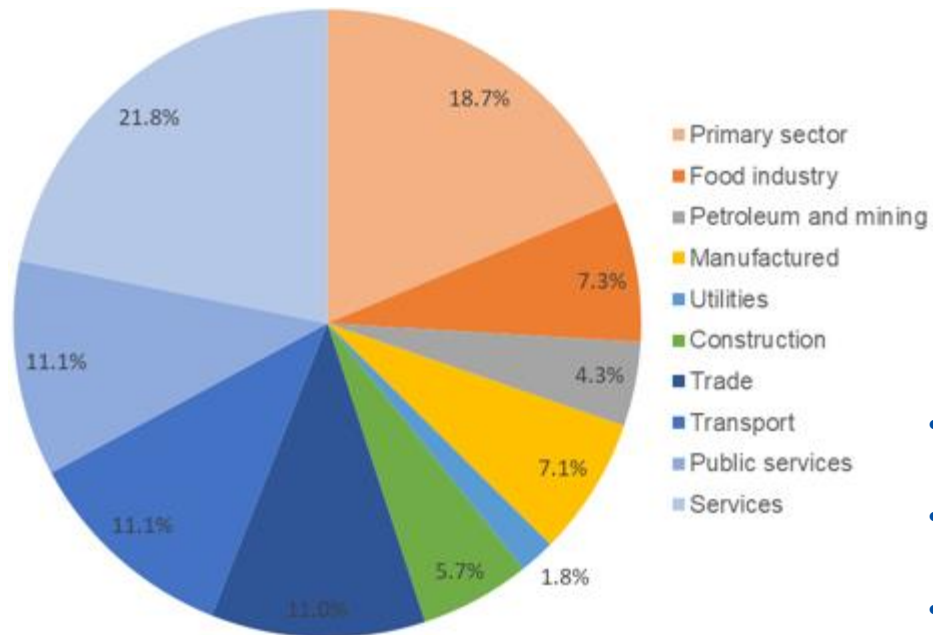
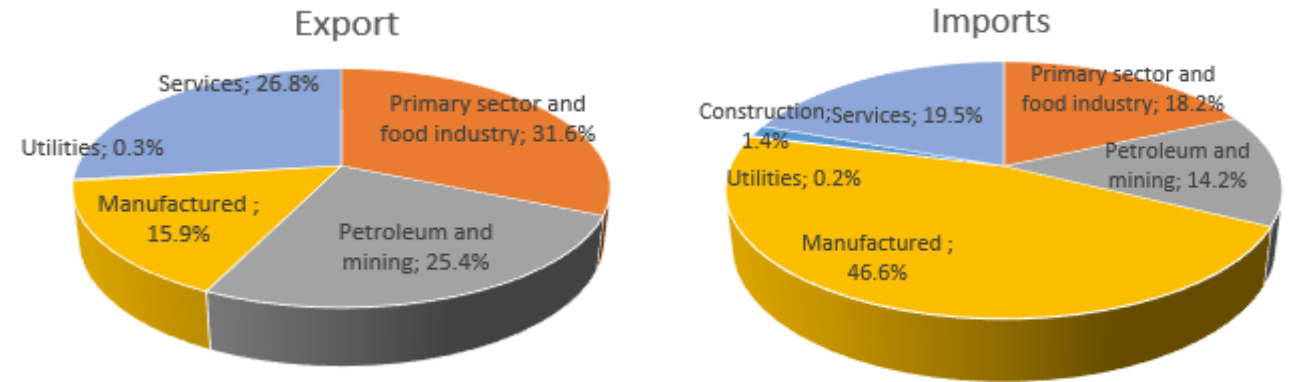


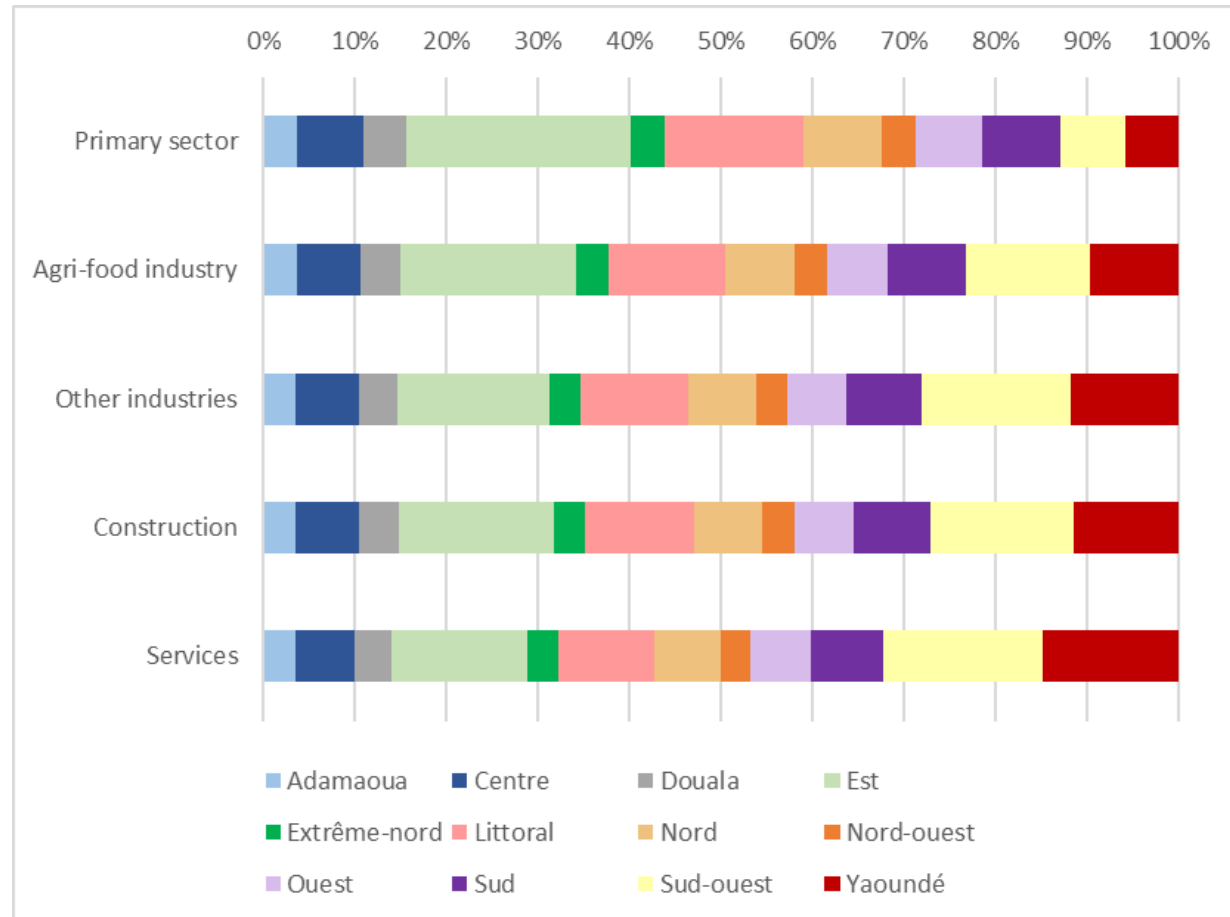
Figure 2. Exports and imports composition. Cameroon 2016.



- Primary and secondary sector represent 44,9% of value added in 2016.
- Primary sector represent 47% of employment (2016 values).
- Exports: energy products (22% in 2016) and agriculture products (20% in 2016).
- Imports: manufacturing (46.6%), due to imports of machinery and equipment and chemical products.

Country context

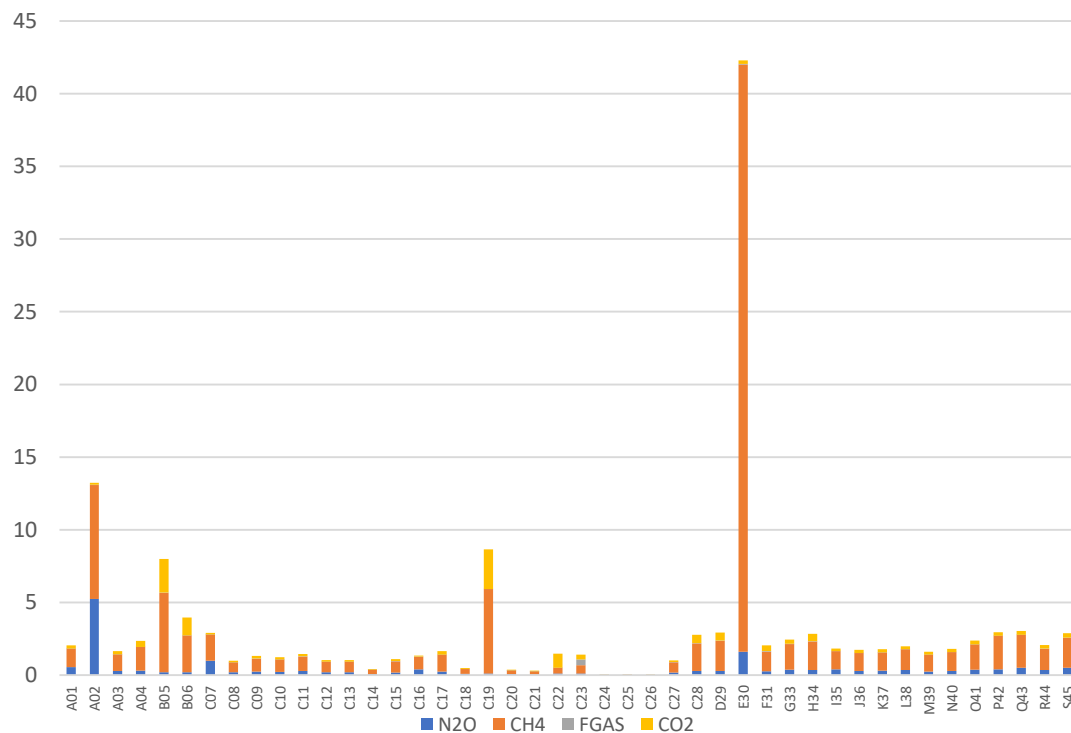
Figure 3. Number of jobs generated by region per million FCFA of output value (employment multipliers).



- The overall composition per macro-sector highlights how the employment multiplier is distributed across regions.
- **Est** region expresses the highest share in the Primary sector and in the Agri-food industry, also when compared across regions. The next most important region for this sectoral group is represented by **Littoral**.
- **Yaoundé** displays higher shares in the Other industries and in the Services.
- Another important region is the **South-West**, with relevant values mainly in the Other industry, Construction and in the Services.

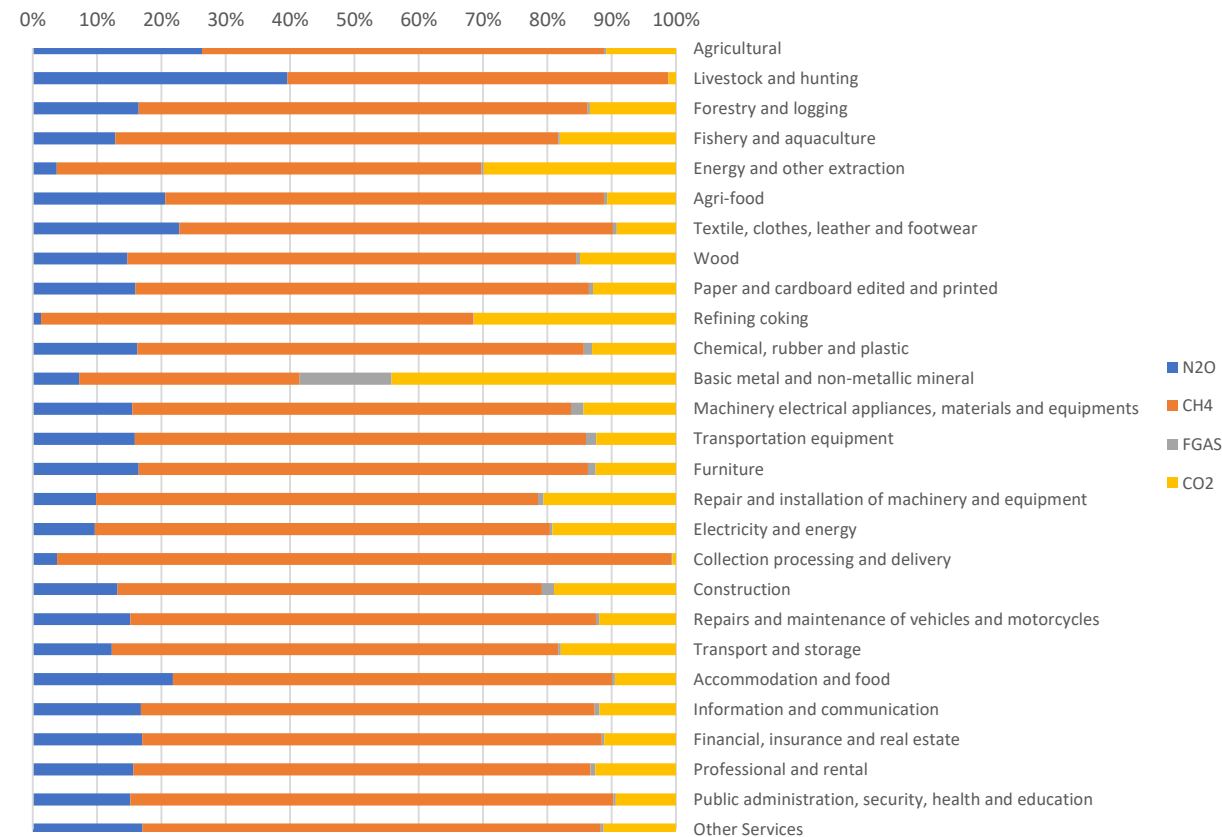
Emission multiplier

Figure 4. Total emissions multiplier by type (CO₂ Eq).



The most **CO₂Eq** intensive activity is 'Collection processing and delivery service', followed by 'Livestock and hunting'. CH₄ is the most influential, representing 75% of the total multiplier value, followed by N₂O with 13%, CO₂ with 11% and FGAS with 1%.

Figure 5. Distribution of the emissions multiplier by type (CO₂ Eq).



By source, the impact of the 'Livestock and hunting' is mostly associated with higher N₂O and CH₄ emissions, however 'Collection processing and delivery service' stands out for CH₄.

Employment intensity of carbon

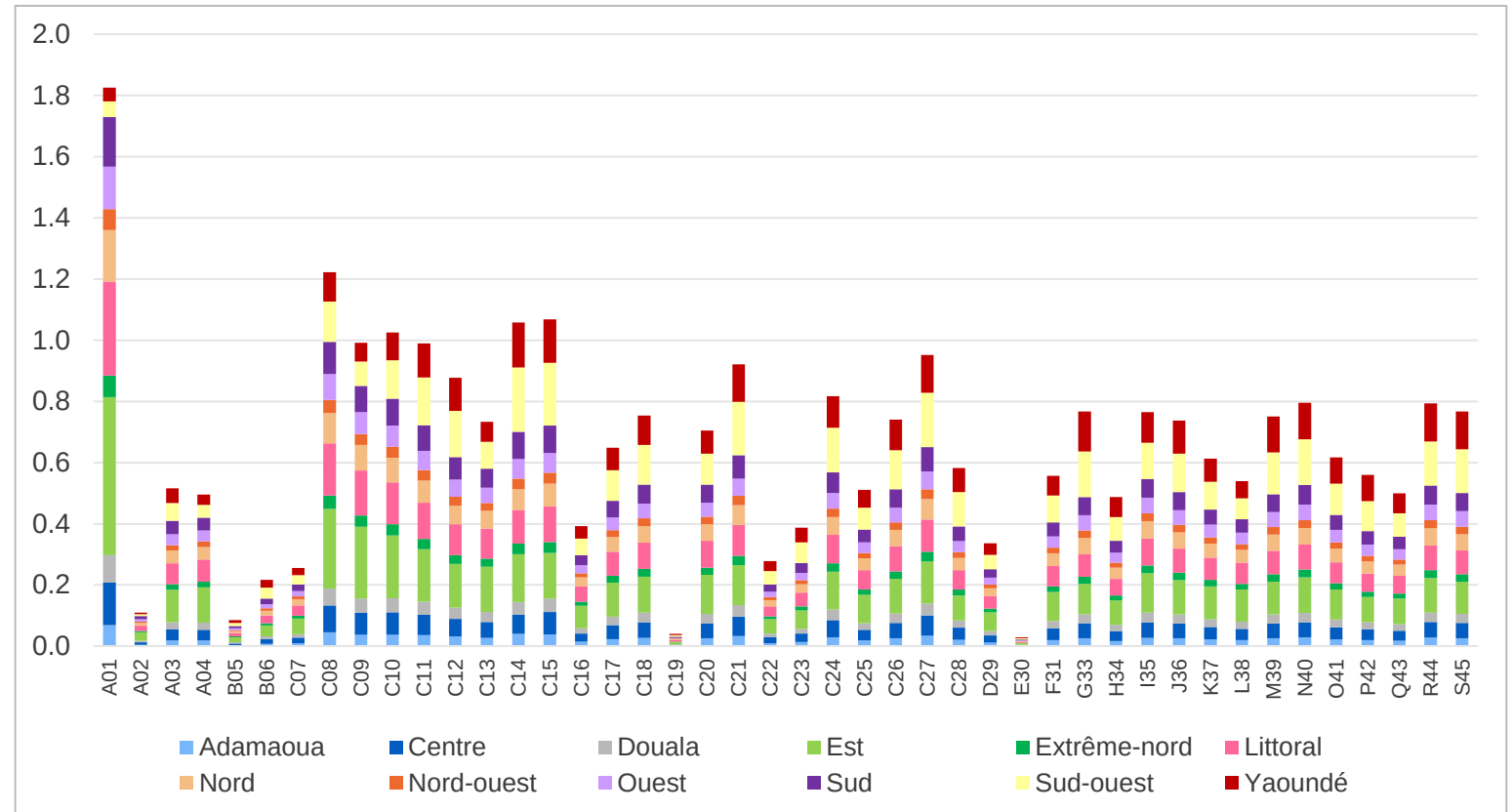
- Calculation: $\frac{\text{Employment multiplier}}{\text{CO}_2 \text{ emission multiplier}}$
- Shows the amount of employment associated to CO₂Eq. emitted by the production of goods and services.
- Results interpretation:
 - Every million FCFA spent in each commodity creates simultaneously an impact in the emissions and in the employment due to the increase in the production.
 - For example, in the agricultural sector, a unitary increase in the final demand would result in 25 job created per a tonne of CO₂Eq. emitted.

Overall results

Cameroon regions

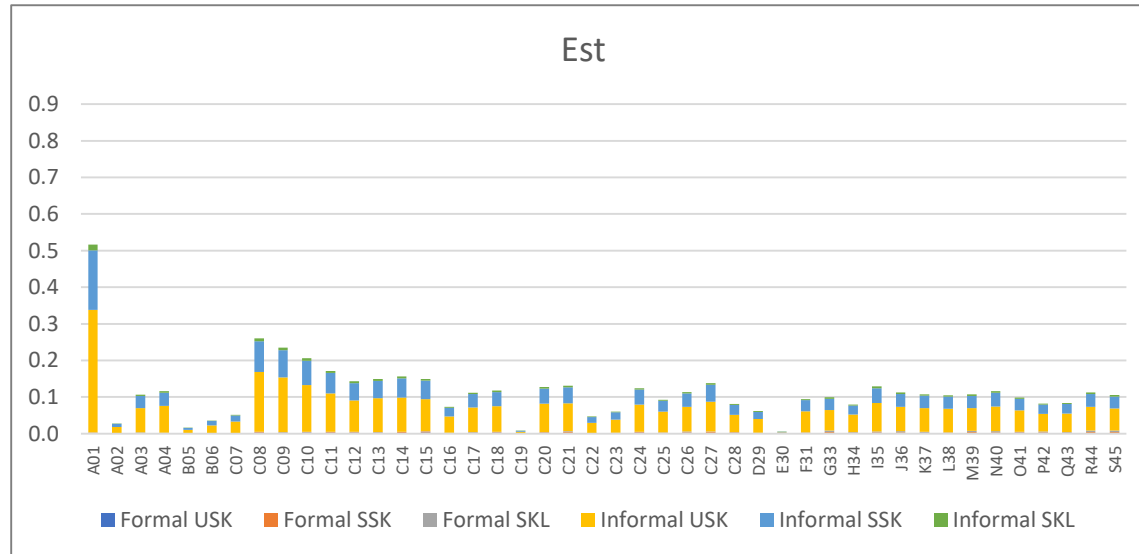


Figure 6. Employment by region associated to CO₂Eq. emissions (tonnes) generated due to an exogenous impact on commodities demand.

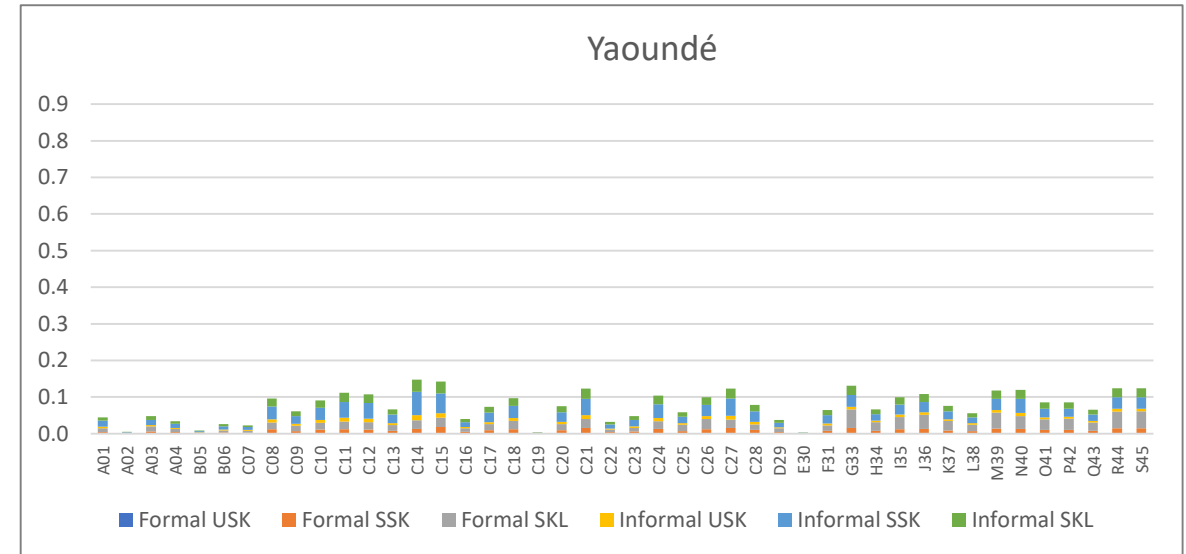


Regional results

Figure 7. Employment by region associated to CO₂Eq. emissions (tonnes) generated due to an exogenous impact on commodities demand.

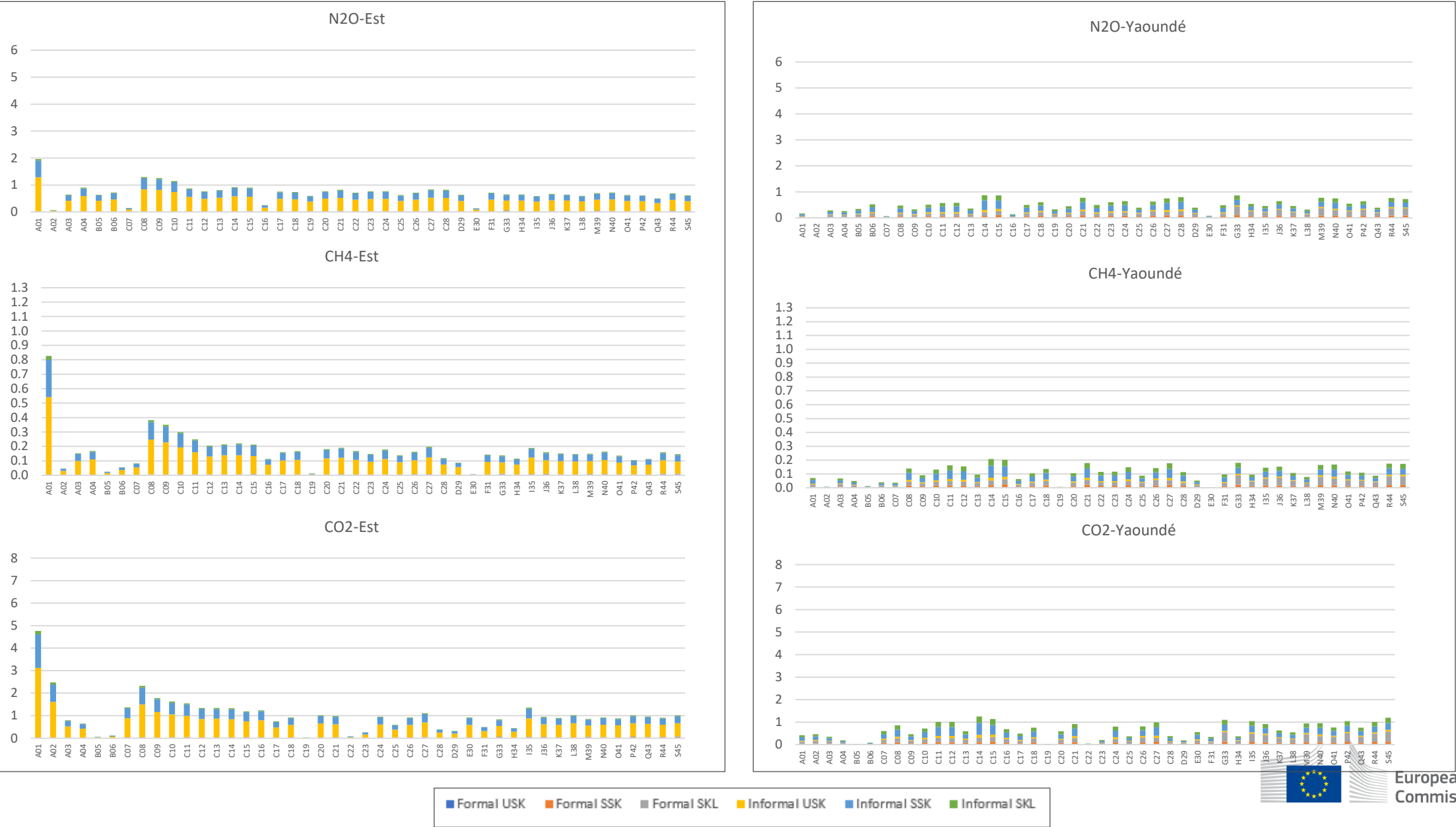


For the **Est** region, the highest values are for the primary sector, especially agriculture, and for the food industry (where the 'Manufacture of grain mill products, starches and starch products'(C08) and 'Cocoa, coffee, tea and sugar products'(C09) stand out among others). There is a clear predominance of informal unskilled labor, and to a lesser extent informal semiskilled.



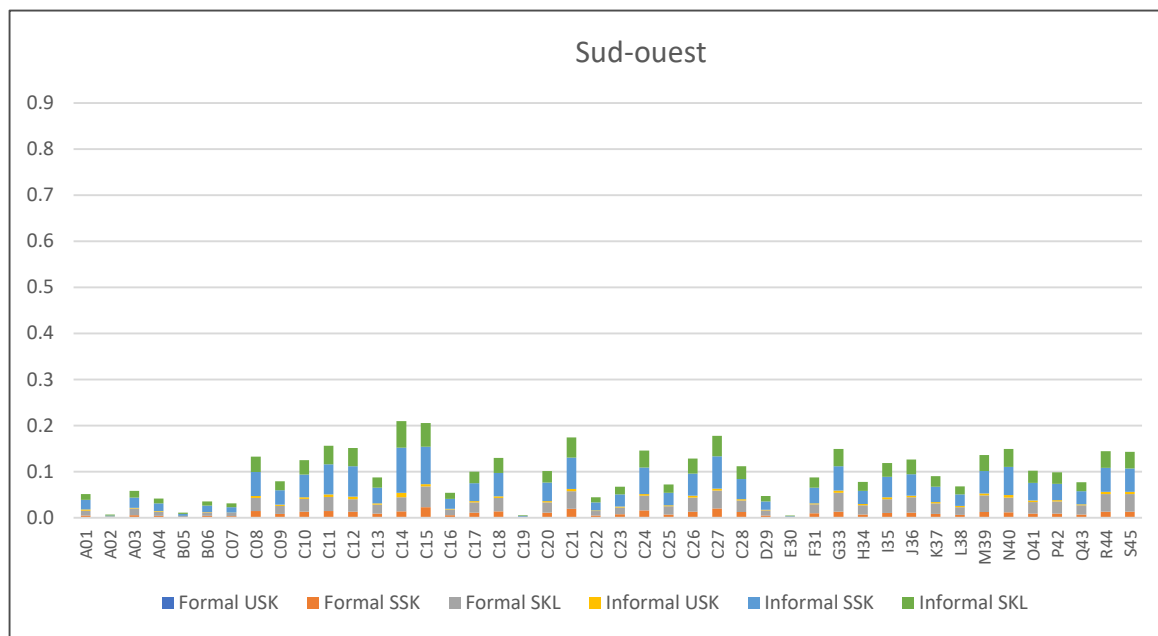
For the capital **Yaoundé**, the impact is more concentrated on manufacturing and services, highlighting the informal skilled and semiskilled employment. Focusing on the generation of formal employment, there is a slight impact for some sectors.

Figure 8. Employment associated to CO₂Eq. by type of emissions (tonnes) generated due to an exogenous impact on commodities demand.

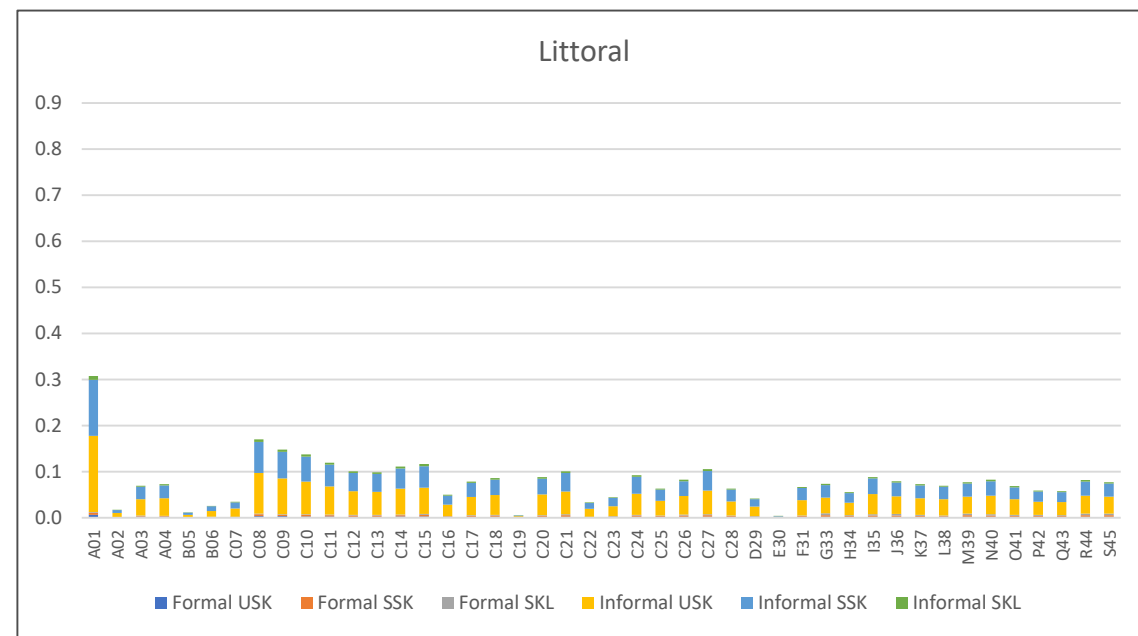


Regional results

Figure 9. Employment by region associated to CO₂Eq. emissions (tonnes) generated due to an exogenous impact on commodities demand.

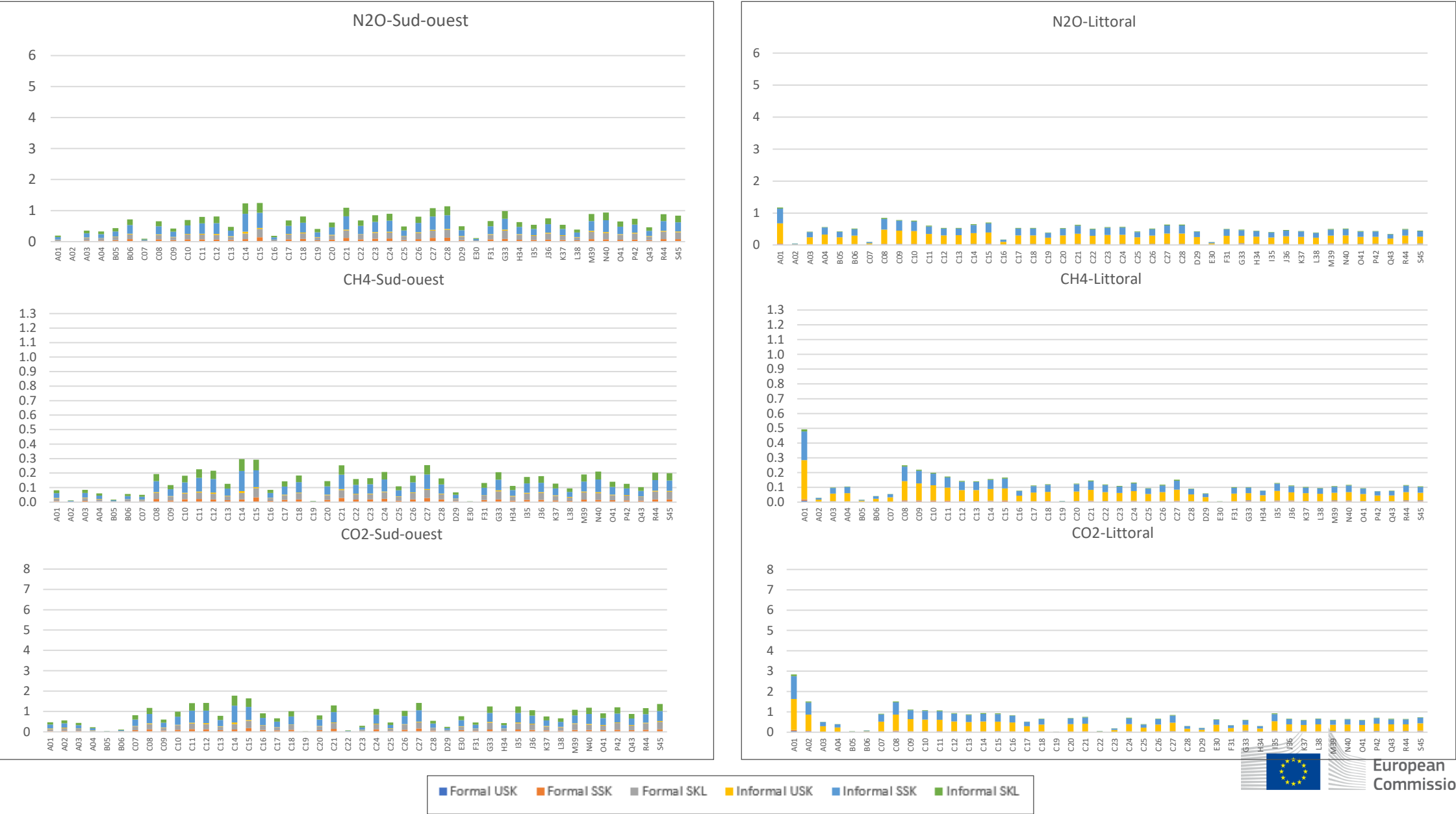


For the **Sud-ouest** region the impact is more concentrated on manufacturing and services, highlighting the informal semiskilled and skilled employment. Considering formal employment, there is a slight impact for some sectors mostly related to semiskilled jobs.



For the **Littoral** region, the highest values are for the primary sector and for the food industry. There is a clear predominance of informal unskilled and informal semiskilled labor.

Figure 10. Employment associated to CO₂Eq. by type of emissions (tonnes) generated due to an exogenous impact on commodities demand.



Policy implications

- National long-term GHG emissions target: reduction of GHG emissions by 35% for the target year 2035 (reference year 2010).
- Cameroon's development Strategy: economic growth, formal job creation and poverty reduction.

Figure 6. Percentage of GHG emissions by sector in 2010 excluding forestry

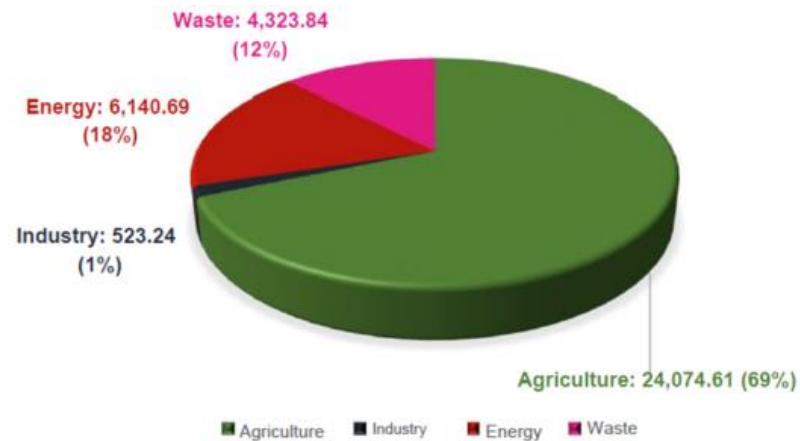


Table 2. Share of reduction by sector in 2030

Sectors	Agriculture	FAT	Energy	Waste	Total
Reduction in quantity (Gg Eq CO2)	6808.48	19378.63	13369.85	2701.78	42258.73
Share of each sector in the total reduction (%)	16.1%	45.9%	31.6%	6.4%	100%
Share of each sector in percentage reduction (%)	5.7%	16.3%	2.3%	2.3%	35.5%

Future developments

- Disaggregation of the Agriculture Sector
- Including the households as activities
- Labour disaggregation
- More detail by income groups (i.e. households by regions)

Thank you



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