

# Reporting on the Impacts of Response Measures: Ghana Case Study

Workshop 3

05/04/2021

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## ERCST

European Roundtable on  
Climate Change and  
Sustainable Transition





# Agenda

## Session 1: identification of relevant response measures in Ghana

- Context and ERCST's work on Response Measures
- Methodology for Ghana Case Study
- Main findings from previous steps: Step 2 & 3
- Findings Step 4 of the methodology
- Questions and next steps

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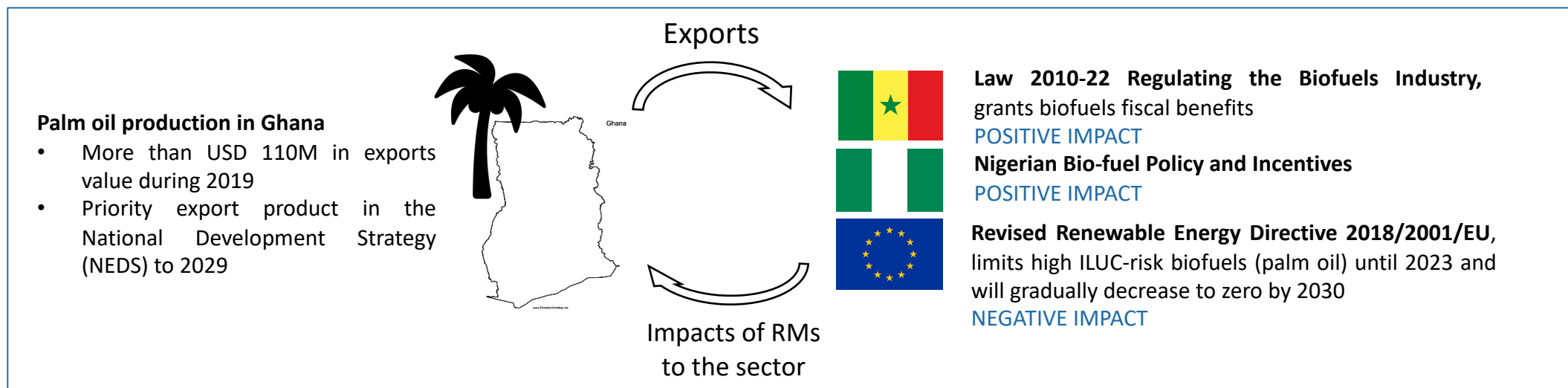
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# What are “response measures” and why they matter?

- **Response measures (RM):** are mitigation policies that countries implement to alleviate the adverse effects of climate change
- **Impacts:** RM may have cross-border positive and negative impacts on other countries (employment changes, change in trade patterns, carbon costs, etc.)
- **Important component of the Paris Agreement** and has its grounding in UNFCCC discussions
- Finds resonance in the **just transition** discussion and the need to manage the **transition to a low carbon economy**
- The issue of RMs, especially in its international dimension, **is not yet well understood**

**Figure 1.** Example of impacts of RM for palm oil sector in Ghana



## ERCST's work on Response Measures

- **In 2018**, ERCST launched an informal dialogue on response measures, bringing together UNFCCC negotiators and key stakeholders to discuss this issue and its negotiations under the UNFCCC.
- **In 2019**, ERCST continued this informal dialogue on response measures, focusing on the agreed work programme in Katowice. ERCST also carried out a case study on “reporting on response measures under biennial update reporting” in Chile.
- **In late 2020**, ERCST has started developing a new case study will for Ghana. This work will continue throughout 2021 and the information of the dialogue will be shared with the KCI.
- **Limited methodologies** on identification and quantification on the impacts of response measures



# Project objectives

- ERCST and the EPA in Ghana have been working together on **identifying, measuring and analysing the impacts of the implementation of response measures in Ghana**
- To foster capacity building and stakeholder participation, virtual workshops are being organized at each stage of the development of the case study
- One of the main objectives is to **test, refine and improve the methodology** that ERCST has developed in different countries
- The research and information from this Informal Dialogue will be shared and will **feed into the discussions of KCI and the Forum** on response measures

# Methodology for Country Case Study: Ghana

**STEP 1** Describe the country and its characteristics

**STEP 2** Identifying important sectors to the Ghanaian economy

**STEP 3** Identify sectors potentially vulnerable to international response measures

THIS WEBINAR

**STEP 4** Identify relevant response measures

**STEP 5** Assess the impacts of international response measures

**STEP 6** Look at possible domestic and international tools and support which may be needed to address the impacts

Identifying  
Vulnerable  
Sectors

Identifying  
Response  
Measures

Assessing the  
Impacts

## Step 2 & 3 results

**Table 1.** Top 12 sectors ranked by Vulnerability Indicator

- Filtering process, from 71 to 12 sectors

Sector Description		GDP at Current Market Prices Gh¢	Employment by econ. activity*	(1) GHG Intensity	(2) Trade Intensity	(3) Vulnerability Indicator
ISIC Rev 4 Code	Description	% of GDP	% of tot. workforce	kgCO2e/\$	Indicator	(1)*(2)
0127, 1073	Cocoa	1,35%	26,86%	2,624	1,70	4,449
0126	Palm oil	0,59%	26,86%	2,635	0,50	1,308
11, 10 (-1073, -1020)	Manufacture of beverages & food products	2,64%	7,95%	0,545	0,51	0,280
03,1020	Fishing	0,93%	0,09%	0,419	0,54	0,226
0610, 0620, 1920	Oil and gas	4,55%	0,03%	0,100	1,82	0,182
05, 07 (- gold of 0729), 08,09	Mining and quarrying without oil and gas and gold	3,19%	0,15%	0,356	0,33	0,118
23	Manufacture of other non-metallic mineral products	0,95%	0,21%	0,103	0,46	0,048
2420, 0729	Gold	7,13%	1,62%	0,027	1,44	0,039
25	Manufacture of fabricated metal products, except mach. and equip.	0,85%	0,52%	0,009	0,50	0,004
22	Manufacture of rubber and plastics products	1,11%	0,09%	0,005	0,54	0,003
20	Manufacture of chemicals and chemical products	2,43%	0,16%	0,005	0,48	0,003
WTO 1.33, 1.36	Tourism (travel, and expenditure by main purpose of trip)	2,77%	3,70%	-	-	-

**Source:** own elaboration based on GSS, ILOSTAT, BUR/NIR, UN Comtrade, UNWTO and other relevant sources for missing data points

\*Data: ILOSTAT LFS (2017), employment by economic activity - ISIC level 2, Cocoa and palm oil under broad category ISIC 01 - Crop and animal production

**For more info:** <https://seureservercdn.net/160.153.137.163/z7r.689.myftupload.com/wp-content/uploads/2021/01/20210215-ERCST-Presentation.pdf>

# Revisions to the employment filter for crop activities

**Table 2.** Employment per sector for top 20 vulnerable sectors

Sector Description		GDP at Current Market Prices (Gh¢ Million)	Employment		
ISIC Rev 4 Code	Description	% of GDP	Employment	% of total workforce	% of total workforce *2
2420 & 0729	Gold	7,13%	155.755	1,6%	-
0610 & 0620 & 1920	Oil and gas	4,55%	101.929	1,1%	-
0113	Yam	3,33%	85.644	0,9%	1,8%
05, 07 (- gold of 0729), 08,09	Mining and quarrying without oil and gas and gold	3,19%	13.573	0,1%	-
WTO 1.33 & 1.36	Tourism (travel, and expenditure by main purpose of trip)	2,77%	354.000	3,7%	-
11 & 10 (-1073, -1020)	Manufacture of beverages & food products	2,64%	761.662	8,0%	-
14	Livestock	2,47%	63.428	0,7%	1,3%
20	Manufacture of chemicals and chemical products	2,43%	15.032	0,2%	-
0122	Plantain	1,83%	46.992	0,5%	1,0%
0113	Cassava	1,40%	36.050	0,4%	0,8%
0127 & 1073	Cocoa	1,35%	34.800	0,4%	-
02	Forestry and Logging	1,33%	34.107	0,4%	0,7%
0129, 0116, 0127	Other tree crops (coffee, rubber, cotton)	1,25%	32.102	0,3%	0,7%
22	Manufacture of rubber and plastics products	1,11%	9.036	0,1%	-
0111	Groundnuts	1,01%	25.868	0,3%	0,5%
023	Manufacture of other non-metallic mineral products	0,95%	20.427	0,2%	-
03,1020	Fishing	0,93%	80.589	0,8%	-
25	Manufacture of fabricated metal products, except machinery and equipment	0,85%	49.915	0,5%	-
0126	Palm oil	0,59%	15.172	0,2%	-
0119	Maize	0,55%	14.259	0,1%	0,3%
		Total employment	9.580.143		

Source: Own elaboration based on ILOSTAT LFS (2017) data



# Adding the national planning data

- Potential vulnerable sectors to intl' RM from category II: aluminum, iron & steel, automobiles, petrochemicals
- All these sectors already included in our analysis, apart from automotive, would need to see their plans of expansion and which countries are planned for exports
- Automotive unlikely to face a big threat unless exports are planned outside of Africa

Figure 2. National Export Development Strategy (NEDS) 2020 to 2029

PRIORITY PRODUCTS LIST	
Category I: Existing high-performance products for contributing to the projected target	Category II: Strategic Anchor Industrial Products for industrial transformation
<ul style="list-style-type: none"> <li>Processed Cocoa</li> <li>Cashew (Processed &amp; In-shell)</li> <li>Horticultural Products</li> <li>Oil Seeds (Processed)</li> <li>Fish &amp; Fishery Products</li> <li>Apparel</li> <li>Natural Rubber Sheets</li> <li>Aluminum Products</li> <li>Articles Of Plastic</li> <li>Services</li> </ul>	<ul style="list-style-type: none"> <li>Pharmaceuticals</li> <li>Aluminium Products</li> <li>Iron and Steel Products</li> <li>Automobiles and Vehicles</li> <li>Garments and Textiles</li> <li>Industrial Salt</li> <li>Petro-chemicals</li> <li>Machines and Machine Components</li> <li>Industrial Starch</li> <li>Oil Palm</li> </ul>

Source: Ministry of Trade and Industry GEPA, 2020

Figure 3. News from Ghana aluminium and automotive industry

Ghana Aluminium Industry: A sector to be worth \$10 billion, can create 30,000 jobs

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**Category**  
General

**Date**  
22-Nov-2020

**Source**  
AlCircle

**Edited By**

**Detail**  
Africa is a continent which is rich poor. The biggest reason for it exports its precious raw material failing to add value to the res economical fall-outs and many / the problem. Ghana, a West Af

**Economy**

## Multinational car companies eye opportunities in Ghana

*Automotive giants look for a way in as Ghana rises as a regional hub for car assembly.*

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Ghana to emerge as an automotive production hub in West Africa for its developing aluminium sector: Fitch Solutions

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**Category**  
Automobiles (cars)

**Date**  
05-Oct-2020

**Detail**

## Volkswagen opens vehicle assembly facility in Ghana

Volkswagen is expanding its footprint in Sub-Saharan Africa with the official opening of a vehicle assembly facility in Accra, Ghana

© August 3, 2020

119

6 min. read

*g to set up bases in the ive to automotive*

Source: local newspapers



## Step 4: Identification process of relevant response measures

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# Step 4.1 Identification of top trading partners vulnerable sectors

- Consists of 2 sub-steps, data from UNComtrade for 2019
- **Step 4.1.1** Identifying top 5 export partners per sector, took top export products (HS codes) representing 90% or more of the export category (Table 3)
- **Step 4.1.2** Adding up all values of the different sectors per country (Table 4)

**Table 3.** Step 4.1.1 - example for 2 sectors, step 4.1.1

Product Description		2019 Top 5 Export Partners: Value (USD)	
ISIC Rev 4 Code	Product	Country	Total Value
0127, 1073	Cocoa	Netherlands	692482090
		Japan	296652405
		USA	246818388
		Malaysia	230959617
		Germany	159950759
0610, 0620, 1920	Oil and Gas	China	2376380429
		South Africa	903373960
		India	409213110
		USA	370932192
		United Kingdom	241901848

Source both tables: own elaboration based on UNcomtrade data

**Table 4.** Step 4.1.2 - total exports value for vulnerable sectors by country

Country	Total value exports (USD) 2019
China	2873710487
Switzerland	2377844886
India	2177621119
South Africa	1962260483
UAE	874624539
Netherlands	692482090
USA	617750580
UK	297704408
Japan	296652405
Malaysia	244118505
Germany	183809113
Burkina Faso	175336239
Togo	105760610
Ukraine	74903046
Senegal	60691742
Sierra Leone	54584994
France	41759247
Benin	28697224
Niger	24967406
Belgium	21775767
Côte d'Ivoire	20198406
Nigeria	19758763
Mali	14112268
Brazil	9599846
Canada	9140709

# Step 4.2 Our definition of response measures and their impacts

**Table 5.** List of response measures, potential impacts and vulnerable sectors to each response measure

Response measures	Impacts in country undertaking the response measure	Possible impacts in other countries	Sectors vulnerable (negative impacts)
<b>Carbon taxes</b>	decreased demand for carbon-emitting goods; increased demand for low-carbon emitting goods	Negative effects: fossil fuel producers, carbon-intensive goods producers. Positive effects: low-carbon goods producers (e.g., renewable energy/EV components)	crude oil, refined oil, natural gas, coal
<b>Subsidies</b>			
<i>for low-carbon transport</i>	decreased demand for goods associated with internal combustion engines.	Negative effects: producers of fossil fuels, lead. Positive effects: producers of EVs, cobalt, lithium, vanadium.	crude oil, refined oil, lead, conventional automobiles
<i>for low-carbon energy production</i>	decreased demand for thermal fuels	Negative effects: coal, natural gas, oil producers. Positive effects: low-carbon energy technology (e.g., PV solar cells) and inputs (e.g., steel and cement for wind turbines)	coal, natural gas
<i>removal of, for fossil fuel production</i>	decreased production of fossil fuels	Positive effects: fossil fuel producers, alternative tech producers. Negative effects: fossil fuel consumers.	crude oil, refined oil, coal, natural gas
<i>removal of, for fossil fuel consumption</i>	decreased consumption of fossil fuels	Negative effects: fossil fuel producers. Positive effects: fossil fuel consumers, alternative tech producers.	crude oil, refined oil, coal, natural gas
<i>for energy efficiency in buildings</i>	decreased energy consumption, increased employment in construction sector	Effects depend on fuel source used in implementing country buildings. If imported fossil fuels used, negative effects on foreign producers.	any fuel source used for residential and commercial heating: gas and coal
<b>Green procurement</b>			
<i>of energy</i>	decreased demand for thermal fuels, increased demand for low-carbon energy technologies	Negative effects: coal, natural gas producers. Positive effects: coal and natural gas consumers (price decrease), producers of alternative energy tech.	coal, natural gas
<i>of automobiles</i>	decreased demand for goods associated with internal combustion engines.	Negative effects: fossil fuel producers. Positive effects: cobalt, lithium, vanadium producers, EV producers.	crude oil, refined oil
<b>Cap and trade schemes</b>	decreased demand for carbon-intensive goods; increased demand for low-carbon goods	Depends on details of scheme, but possible: Negative effects: fossil fuel producers. Positive effects: renewable energy/low-carbon transport tech producers; fossil fuel consumers.	coal, natural gas, steel and associated products, aluminum, cement, basic plastics, nitrate fertilizers, high-GHG electricity, oil, pulp & paper and associated products

# Step 4.2 Our definition of response measures and their impacts

**Table 5 (cont’).** List of response measures, potential impacts and vulnerable sectors to each response measures

Response measures	Impacts in country undertaking the response measure	Possible impacts in other countries	Sectors vulnerable (negative impacts)
<b>Liberalization of trade in environmental goods</b>	boost in consumption of green goods	Positive effects: producers of covered environmental goods	conventional competitors to liberalized green goods
<b>Border carbon adjustment</b>	decreased demand for high-carbon goods (aluminum, steel, cement, plastics, pulp & paper); increased demand for substitutes.	Depends on carbon intensity, and regime details, but likely: Negative effects: aluminum, steel, cement, plastics, pulp & paper. Positive effects for low-carbon producers.	steel and associated products, aluminum, cement, basic plastics, nitrate fertilizers, high-GHG electricity, oil, pulp & paper and associated products
<b>Standards and labelling requirements</b>			
<i>for agricultural goods, involving GHG intensity</i>	depends on details of the scheme, but likely loss of market share for non-certified air-frieghted goods, inter alia.	Depends on details of the scheme, but possible: Negative effects for producers of perishable fruits such as berries, high-value horticulture	air-freighted produce; agricultural goods that involve deforestation and/or high use of nitrate fertilizers
<i>mandatory efficiency performance standards for consumer goods, industrial equipment</i>	restricts the market to high-efficiency products; reduces demand for fuel	Negative effects: fossil fuel producers; producers of low-efficiency consumer goods and industrial equipment. Positive effects: fossil fuel cosnumers; producers of high-efficiency goods/equipment	white goods, machinery
<i>for basic materials, involving GHG intensity</i>	restricts the market to low-GHG intensity products in basic materials; reduces demand for fuel	Negative effects: depending on GHG intensity, may restrict market access for basic materials in metals, minerals, chemicals sectors	steel and associated products, aluminum, cement, basic plastics, nitrate fertilizers, pulp & paper and associated products
<b>International aviation levies</b>	n/a - international	Negative effects: flight-based tourism sectors (e.g., hotels, restaurants); producers of air-freighted (perishable) goods.	national airlines; hotels, restaurants, tour operators
<b>International maritime levies</b>	n/a - international	Negative effects: increased costs of imports and exports using maritime transport	sectors with high share of imported intermediate goods, capital goods; sectors that rely on maritime transport for export

Source: ERCST Chile Case Study and modifications

# Step 4.3 and 4.4 Matching response measures and selecting sources

- Two final steps needed before the final identification of response measures
- **Step 4.3** Matching response measures to sectors and countries identified in previous steps (Table 6)
- **Step 4.4** Selecting the sources and databases for the identification of the response measures (Table 7)

**Table 6.** Step 4.3 Examples of matching response measures to sectors and countries

Country	Sectors	Type of RM searched for
<b>China</b>	- Crude and refined oil - Fishing - M&Q without oil and gas and gold (aluminium and manganese) - Gold	- carbon taxes - subsidy for low carbon transport - removal of subsidy for fossil fuel production - removal of subsidy for fossil fuel consumption - subsidy for energy efficiency in buildings - green procurement for automobiles - CBAM - standards and labelling requirements for agri. goods involving GHG intensity - for basic materials involving GHG intensity
<b>Switzerland</b>	- Gold	-na
<b>Germany</b>	- cocoa - fishing - manufacture of fabricated metal products (iron and steel, aluminium)	- standards and labelling requirements for agri. goods involving GHG intensity - international maritime levies - international aviation levies - CBAM - standards and labelling requirements for basic materials involving GHG intensity

Source: own elaboration based on previous data and Table 5

**Table 7.** Step 4.4 – selecting sources for identification of RM

Sources
1. EEA database
2. OECD database
3. NDCs
4. WTO environmental database
5. IEA Building Energy Efficiency Policy Database
6. ICAP carbon market database
7. FAOLex database
8. Global Climate Legislation Database
9. IEA/IRENA Joint Policies and Measures Database
10. ITC Sustainability Map, Standards Map
11. International Civil Aviation Organization (ICAO), CORSIA
12. International Maritime Organization (IMO)
13. UNFCCC Synthesis Report
14. World Bank, Carbon Pricing Dashboard
15. IEA Global EV Outlook
16. Organic Export Info (funded by Switzerland)
17. Relevant government websites

Source: ERCST Chile Case Study with modifications



## **Step 4: Results of the identified response measures for the vulnerable sectors**

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## Sector 1: Cocoa (ISIC Rev 0127,1073)

<u>Netherlands</u>	<u>Japan</u>	<u>USA</u>	<u>Malaysia</u>	<u>Germany</u>	<u>Other international</u>
EU regulation 2018/848 on organic production and labelling of organic products	JAS Organic Label based on JAS Act (Act on Japanese Agricultural Standards)	USDA National Organic Program (NOP)	Standard MS 1529:2001, Skim Organik Malaysia (SOM)	EU regulation 2018/848 on organic production and labelling of organic products	<b>Voluntary certifications for cocoa:</b> <ul style="list-style-type: none"> <li>• UTZ and Rainforest Alliance ISO 34101-1, Sustainable and traceable cocoa</li> </ul> <b>Voluntary fair trade certifications</b> <ul style="list-style-type: none"> <li>• Fairtrade Labelling Organisations (FLO)</li> <li>• Fair Trade Ecocert</li> <li>• Fair for Life</li> <li>• Fairtrade International</li> </ul>
EU Multi-stakeholder Dialogue for Sustainable Cocoa (until July 2021) <ul style="list-style-type: none"> <li>• Feed into relevant EC initiatives: Circular Economy Action Plan, Farm to Fork, env. due diligence</li> </ul>	Platform for Sustainable Cocoa in Developing Countries <ul style="list-style-type: none"> <li>• Established by the gov. in January 2020</li> </ul>			EU Multi-stakeholder Dialogue for Sustainable Cocoa (until July 2021) <ul style="list-style-type: none"> <li>• Feed into relevant EC initiatives: Circular Economy Action Plan, Farm to Fork, env. due diligence</li> </ul>	
Gov. letter of intent on 100% sustainable cocoa in the NL by 2025 <ul style="list-style-type: none"> <li>• Dutch Initiative on Sustainable Cocoa (DISCO)</li> </ul>					

## Sector 2: Manufacture of beverages & food products (ISIC Rev 11, 10)

<u>Belgium</u>	<u>Malaysia</u>	<u>Burkina Faso, Togo, Niger</u>	<u>International transportation</u>
EU regulation 2018/848 on organic production and labelling of organic products	Standard MS 1529:2001, Skim Organik Malaysia (SOM)	na	CORSIA/ICAO (for air freight)

### Sector's main products:

- 35% Fixed vegetable fats & oils (incl. jojoba oil)
- 4.1% Tomatoes, prepared/preserved, other than whole/in pieces
- 3.7% Gin & Geneva

Note: governments provide regulations for organic standards and oversee their compliance however there is no jurisdiction where it is mandatory to label the whole food supply of the country as organic. Additionally organic guidelines usually don't mention directly climate-related issues however they still have an indirect mitigation impact where organic agricultural systems are applied (e.g. carbon sequestration in soils by using different env. practices).



# Sector 3: Palm Oil (ISIC Rev 0126)

<u>Senegal</u>	<u>Nigeria</u>	<u>EU*</u>	<u>Benin, Burkina Faso, Niger</u>
<p><b>Law 2010-22 Regulating the Biofuels Industry</b></p> <ul style="list-style-type: none"> <li>Grants biofuels fiscal benefits, revenues generated from biofuel activities are exempted from taxation for 5 yrs</li> </ul>	<p><b>National Renewable Energy and Energy Efficiency Policy (NREEEP)</b></p> <ul style="list-style-type: none"> <li>Defines the government's position on how to strengthen renewable energy and energy efficiency in the country</li> </ul>	<p><b>Revised Renewable Energy Directive 2018/2001/EU</b></p> <ul style="list-style-type: none"> <li>Limits high ILUC-risk biofuels (palm oil) until 2023 and will gradually decrease to zero by 2030</li> </ul>	na
<p><b>Renewable Energy Law (No. 2010-21)</b></p> <ul style="list-style-type: none"> <li>Regulates the renewable energy sector outlining goals, laying the foundation for a feed-in-tariff scheme, and providing tax incentives for development</li> </ul>	<p><b>Nigerian Bio-fuel Policy and Incentives</b></p> <ul style="list-style-type: none"> <li>Measures aimed at stimulating market demand for biofuels and promoting their production (e.g. tax exemptions)</li> </ul>	<ul style="list-style-type: none"> <li>Belgium, France, Austria and Netherlands announced <b>ban of palm oil as a raw material for transport biofuel</b> from mid-2022.</li> </ul>	
<p><b>Decree No. 2013-684 on the establishment, organization and functioning of the National Agency for Renewable Energies</b></p> <ul style="list-style-type: none"> <li>Promote the use of renewable energy, including bioenergy</li> </ul>			

\*Not in the top 5 export countries for this sector, only in top 10 but considered since it is a a priority product for the Ghanaian National Export Development Strategy (NEDS)

## Sector 4: Fishing (ISIC Rev 3,102)

<u>United Kingdom</u>	<u>France</u>	<u>Germany</u>	<u>United Arab Emirates</u>	<u>China</u>	<u>International transportation</u>
<b>Food (Provisions relating to Labelling) (England, Wales, NI) Regulations 2003 (S.I. No. 2647 of 2003)</b>	<b>Farm to Fork Strategy (EGD)</b> - Aims to reward farmers, fishers and other operators in the food chain who have undergone the transition to sustainable practices. Shift to sustainable fish and seafood production must also be accelerated	<b>Farm to Fork Strategy (EGD)</b> - Aims to reward farmers, fishers and other operators in the food chain who have undergone the transition to sustainable practices. Shift to sustainable fish and seafood production must also be accelerated	<b>Emirates Organic Foods Certification Scheme</b> - Federal law no. (5) Year 2009 for Organic Foods and their inputs.	<b>Directions on Issuing the Organic Labelling Approval Operations Document of Imported Aquatic Products and Aquatic Processed Products</b>	<ul style="list-style-type: none"> <li>• <b>International Maritime Organization (IMO) and other shipping climate change related measures</b></li> <li>• <b>CORSIA/ICAO (for air freight)</b></li> </ul>
				<b>Rules of the Environmental Protection Administration of the Executive Yuan (Taiwan) governing the environmental protection labelling product application and review</b>	
				<b>Measures for the Administration of Organic Product Certification (AQSIQ Decree No. 155)</b>	<p><b>Other international</b></p> <p>Marine Stewardship Council (MSC) label</p>

Note: governments provide regulations for organic standards and oversee their compliance however there is no jurisdiction where it is mandatory to label the whole food supply of the country as organic. Additionally, organic guidelines usually don't mention directly climate-related issues however they still have an indirect mitigation impact where organic fishing practices are applied.

## Sector 5: Oil & Gas (ISIC Rev 0610, 0620, 1920)

China	South Africa	India	USA	United Kingdom	International Transportation
<p><b>NEV Programme China</b></p> <ul style="list-style-type: none"> <li>- by 2025 25% New Energy Vehicle Programme (NEV) (includes PHEV, BEV, FCEV)</li> <li>- government introduced a mandatory credit policy for vehicle suppliers to boost domestic sales of NEVs</li> </ul>	<p><b>Carbon Tax Bill</b></p> <ul style="list-style-type: none"> <li>- Came into effect in 2019</li> <li>- Applies to GHG emissions from the industry, power, buildings and transport sectors</li> <li>- irrespective of the fossil fuel used, with partial exemptions for all these sectors</li> </ul>	<p><b>National electric car purchase subsidy and income tax deduction on loans. Phase II of Faster Adoption and Manufacturing of Electric Vehicles (FAME II)</b></p> <ul style="list-style-type: none"> <li>- Income tax deduction of \$ 2000 on interest paid on electric vehicle loans</li> <li>- deployment of charging stations</li> </ul>	<p><b>Zero-Emission Program (ZEV) for (PHEV, BEV, FCEV)</b></p> <ul style="list-style-type: none"> <li>- by 2025 3.3 million ZEVs in 11 states</li> <li>- by 2050 all passenger vehicle sales to be ZEV in 10 States</li> <li>- Managed by The California Air Resources Board (CARB)</li> </ul>	<p><b>UK carbon Price Floor</b></p> <ul style="list-style-type: none"> <li>- Users liable for payment of the tax for all fossil fuels.</li> <li>- The tax covers all fossil fuels</li> </ul>	<ul style="list-style-type: none"> <li>• International Maritime Organization (IMO) and other shipping climate change related measures</li> <li>• CORSIA/ICAO (for air freight)</li> </ul>
<p><b>National electric car purchase subsidy and exemption of purchase tax (10%)</b></p> <ul style="list-style-type: none"> <li>- Maximum retail price USD 42 400</li> <li>- USD 2 300 if BEV 300 km ≤ range &lt; 400 km</li> <li>- USD 3 200 if BEV range ≥ 400 km</li> <li>- USD 1 200 PHEV range ≥ 50 km</li> </ul>	<p><b>Carbon dioxide vehicle emissions tax (2010)</b></p>	<p><b>National Electric Mobility Mission Plan (NEMMP) 2020</b></p> <ul style="list-style-type: none"> <li>- Mix of incentive-based policies accompanied by regulatory reforms, and PPS to encourage EV adoption, expand charging infrastructure and support domestic EV and supply equipment manufacturing capacity and battery manufacturing</li> </ul>	<p><b>CBAM (under consideration)</b></p> <ul style="list-style-type: none"> <li>- implement a levy on carbon-intensive imports, albeit without a federal domestic carbon price</li> <li>- impose carbon adjustment fees or quotas on carbon-intensive goods from countries that are failing to meet their climate and environmental obligations</li> </ul>	<p><b>UK ETS</b></p> <ul style="list-style-type: none"> <li>- launched on 1 January 2021</li> <li>- UK ETS closely follows the EU Emissions Trading Scheme ("EU ETS")</li> <li>- Established by the Greenhouse Gas Emissions Trading Scheme Order 2020</li> <li>- The UK ETS will apply to energy intensive industries, the power generation sector and aviation.</li> </ul>	
<p><b>Fuel economy standard for light duty vehicles</b></p> <ul style="list-style-type: none"> <li>- Updated for period 2021-25</li> <li>- Standard, to be phased in gradually from 2021, sets a 4L/100 km target for the country's new vehicle fleet in 2025</li> </ul>		<p><b>Clean air standard</b></p>	<p><b>Tax reduction for electric car purchase</b></p> <ul style="list-style-type: none"> <li>- Tax credit up to USD 7 500 (PHEV and BEV)</li> </ul>	<p><b>United Kingdom (EV30@30 signatory)</b></p> <ul style="list-style-type: none"> <li>- by 2030 50-70% EV</li> <li>- by 2035 No sales of new ICEe</li> </ul>	
<p><b>EV charging infrastructure policies</b></p> <ul style="list-style-type: none"> <li>- rollout of subsidies for EV charging infrastructure at national and subnational level (eg. Shenzhen)</li> <li>- The State Grid has announced plans to increase investment in charging stations</li> <li>- City of Beijing has outlined a policy to provide up to USD 28 300 in subsidies per station for operators</li> </ul>		<p><b>National Mission on Transformative Mobility and Battery Storage</b></p> <ul style="list-style-type: none"> <li>- manufacturing scope includes solar equipment, battery storage and charging infrastructure</li> </ul>	<p><b>Transportation and Climate Initiative (TCI) ETS</b></p> <ul style="list-style-type: none"> <li>- Transport fuel suppliers that produce the covered fuels within these states, as well as suppliers that import them to those states.</li> <li>- Program will cap CO2 emissions from the combustion of gasoline and on-road diesel fuel in the participating states</li> </ul>	<p><b>National electric car purchase subsidy</b></p> <ul style="list-style-type: none"> <li>- Up to USD 3 800 (BEV and PHEV)*</li> <li>- Capped at 35% of retail price. Only for cars &lt; USD 63 600</li> <li>- *If &lt; 50 gCO2/km and electric range &gt; 112 km</li> </ul>	

# Sector 5: Oil & Gas (ISIC Rev 0610, 0620, 1920)(2)

China	India	USA	United Kingdom
<b>National ETS</b> (started operating 2021) -The scope is expected to be gradually expanded to cover seven other sectors in addition to power: petrochemical, chemical, building materials, steel, nonferrous metals, paper, and domestic aviation - There is no specific timeline for this expansion	<b>State Level policies supporting EV deployment and taxes on motor vehicles</b> - financial incentives, duty waivers, exemptions from permit fees, streamlined registration processes and supporting infrastructure to encourage EV uptake and charging station deployment.	<b>US Electrify Forward Act (2020)</b> - accelerate domestic manufacturing of batteries, power electronics and other technologies in plug-in vehicles, encourage the installation of EV charging infrastructure, modify and reauthorise the Advanced Technology Vehicles Manufacturing Incentive Program	<b>Considerations of a CBAM</b>
<b>Subnational ETS Pilots</b> - The existing Chinese regional ETS pilots are gradually transitioning into the national ETS	<b>Exploring options such as energy efficiency regulations and fuel diversification to reduce its oil import dependence by 10% in 2022</b>	<b>Oregon ETS (under consideration)</b> - Emissions cap and reductions for large emitters and transportation fuels	<b>Various incentives for Ultra Low Emissions Vehicles (ULEVs)</b>
<b>Law on the Prevention and Control of Atmospheric Pollution</b>		<b>Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks, Corporate Average Fuel Economy (CAFE) standards (NHTSA/EPA, 2020)</b> - Revised version are a roll back from the current federal standard that passed in 2012	
<b>Energy Conservation Law</b> - Industrial and Transport Energy Conservation - Encourages to develop and promote the use of clean fuels and alternative fuels of oil		<b>State level policies supporting the commercial deployment of alternative fuel vehicles and/or their supporting infrastructure</b> - Statewide subsidies, tax credits, or waivers or reductions on inspections that explicitly support EV purchase for private individuals, low-interest loans, leasing	
<b>Subsidies for energy-saving automobiles</b>		<b>Federal tax credit for purchase of EVs not extended</b> (tax exemption of USD2500-7500)	
<b>China’s 14th Five-Year Plan (14th FYP, 2021 to 2025)</b> - sets a 18% “CO2 intensity” and 13.5% “energy intensity” reduction target - Relevant climate targets: “Reduction in energy consumption per unit of GDP(%)”; “Reduction of CO2 emissions per unit of GDP (%)”( binding) - construction of 8 large-scale clean energy “bases” (coastal nuclear power, electricity transmission routes, power system flexibility, oil-and-gas transportation and storage capacity)		<b>California’s Low Emission Vehicles (LEV III) pollutant emissions and GHG regulations</b>	
		<b>California's e Innovative Clean Transit Regulation to reduce emissions from HDV and other state level initiatives from medium and heavy duty vehicles</b>	
		<b>Extension of federal tax credit on charging infrastructure 2019</b>	
		<b>State level charging infrastructure incentives</b>	
		<b>California Cap and Trade Programme (CaT)</b> - Emissions from industry, power, transport and buildings sectors and includes industrial process emissions - Industry operators (> 25,000 tCO2e) are liable for reporting their covered emissions at a facility level.	

## Sector 6: Mining and quarrying without oil and gas and gold (ISIC Rev 05, 07 (- 0729), 08,09)

<u>China</u>	<u>Brazil</u>	<u>Canada</u>	<u>Ukraine and Burkina Faso</u>	<u>International transportation</u>
<b>China Environmental Labelling Program (CELP)</b> - Aims to promote green purchase and green manufacturing in China - Covers sectors as automobile, electrical, construction, textile packaging, chemical	<b>Brazil ETS (under consideration)</b>	<b>CBAM (under consideration)</b> - The gov. will soon launch a consultation process on a carbon border adjustment mechanism (CBAM)	na	<b>International Maritime Organization (IMO) and other shipping climate change related measures</b>
<b>National ETS</b> -The scope is expected to be gradually expanded to cover petrochemical, chemical, building materials, steel, nonferrous metals, paper, and domestic aviation				
<b>Subnational ETS Pilots</b> - existing Chinese regional ETS pilots are gradually transitioning into the national ETS				

### Sector's main products:

- 65% Manganese ores & concentrates
- 7% Aluminium ores & concentrates

# Other sectors with none or few response measures

- We have done the complete analysis for all the 12 sectors, however some of these sectors don't have any impacts of international response measures from the countries they export to, which is mostly African countries (Niger, Burkina Faso, Benin, Niger, Togo, Mali and others)
- Sectors with no response measures:
  - **Sector 7:** Gold (ISIC Rev 2420, 0729)
    - Voluntary frameworks: ICMM Mining Principles, ISO 14001 Env. Mgmt., Net Zero targets, SBTi targets
  - **Sector 8:** Manufacture of other non-metallic mineral products (ISIC Rev 23) - ceramic and quicklime products
  - **Sector 9:** Manufacture of fabricated metal products, except mach. and equip. (ISIC Rev 25) – other articles of iron or steel
  - **Sector 10:** Manufacture of rubber and plastic products (ISIC Rev 22) – packing of goods and tubes, pipes
  - **Sector 11:** Manufacture of chemicals and chemical products (ISIC Rev 20) – dyeing extracts and beauty preparations
- **Sector 12:** Tourism (WTO 1.33, 1.36) is impacted by CORSIA, ICAO measures (detailed description in the following slides)

# International Shipping Climate Change Measures

- Assessed exports streams with a high ratio of weight to value to find which sectors are most vulnerable to international climate shipping measures (Table 8)
- **Ghanaian sectors potentially affected:** oil and gas, mining and quarrying without oil and gas and gold (aluminium and manganese), fishing products
- Likely increase cost of shipping due to IMO and EU ETS climate change related measures

**Table 8.** Net weight exports in 2019 for top 5 export destinations

ISIC Rev 4 Code	Sector	Netweight (kg)	Total value exports 2019 (USD)	Vulnerability to CC related shipping measures (net weight)/(total value)
0610, 0620, 1920	Oil and gas	5772931668	4.301.801.539	134%
05, 07 (- gold of 0729), 08,09	M&Q without oil and gas and gold (alum. and mang.)	4836404102	368.620.778	1312%
3,102	Fishing	80273244	138.404.232	58%
11, 10 (-1073, -1020)	Manuf. of beverages & food products	12672476	34.934.655	36%
0127, 1073	Cocoa	543463047	1.626.863.259	33%
2420,0729	Gold	140223	6.280.834.087	0%
25	Manuf. fabricated metal products	3281	4.298.680	0%

Source: own elaboration based UNComtrade data

# International shipping climate change measures: IMO and ETS

## International Maritime Organization (IMO)

- IMO Resolution MEPC.304(72), target of cutting CO2 emissions from international shipping by at least 50% by 2050, compared to 2008 levels

### **Candidate measures that could impact Ghanaian exports:**

- **Short term measures:** Energy Efficiency Design Index (EEDI), Energy Efficiency Existing Ship Index (EEXI), Ship Energy Efficiency Management Plan (SEEMP), considerations of speed optimization and speed reduction as a measure
- **Medium term measures:** programme for uptake of low-carbon and zero-carbon fuels, possible inclusion of market-based measures

## EU ETS

EU strategy to reduce maritime emissions lays out the following goals: **a)** MRV system for emissions from ships using EU ports; **b)** GHG reduction targets for maritime sector; **c)** in medium to long-term also market-based measures (extension of ETS to the maritime sector)



# Aviation climate change measures: CORSIA/ICAO

- Looked at export categories that include perishable goods and need to be air freighted and tourism sector
- **Ghanaian sectors potentially affected:** fishing products, manufacture of beverages and food products, oil and gas, tourism
- Potential increase of air transport cost for these sectors
- In 2016, ICAO Member States adopted CORSIA which aims to:
  - Stabilize aviation emissions at the average level of CO2 emissions from international flights between 2019 and 2020
  - Establishes, from 2021 onwards, a global market-based mechanism (MBM) to offset, through international credits, CO2 emissions exceeding that average
- Phases of CORSIA implementation: the first two phases, 2021-2023 (pilot) and 2024-2026 where member states decide to participate on a voluntary basis and a mandatory stage that will begin in 2027
- Due to COVID-19 the 2019-2020 emissions average to calculate the emissions baseline was replaced by the 2019 average only for CORSIA's pilot phase. ICAO's Council echoed that the future CORSIA phases could be changed and are subject to flexibility

# Conclusions

- We identified several vulnerable **sectors that are at risk of impacts:**
  - **Sectors:** cocoa, manufacture of beverages and food products (jojoba oil); palm oil; fishing; oil & gas; mining and quarrying without oil and gas and gold (aluminium and manganese)
  - **Response measures:** carbon taxes; subsidies; CBAM; organic standards and labelling requirements for agri. goods and basic materials; aviation and shipping measures
- We identified several vulnerable **sectors that don't appear at risk of impacts:**
  - **Sectors:** gold; manufacture of other non-metallic mineral products; manufacture of fabricated metal products (articles of iron and steel); manufacture of rubber and plastic products; manufacture of chemicals
- While those sectors are not at risk from country-led response measures, some may still be vulnerable via **soft-incentives, voluntary commitments and shareholder pressure:**
  - Examples of voluntary incentives and measures: SBTi, ICM Mining Principles, ISO 14001 Environmental Management, organic and sustainability standards for food products (e.g. UTZ, MSC), and others.
- While we tried to anticipate future sectoral growth, **there may be other sectors of the future whose growth would be inhibited by response measures**
- We have noted a strong asymmetry of climate targets and mitigation actions taken between countries and regions

# Questions and next steps

## On the research and methodology

- Suggestions to improve data or methodology?
- Mitigation policies that we might have overlooked and should include in the analysis?

## On the objective of the project

Now that ERCST has identified the relevant response measures, some questions that arise are:

- What are some solutions that Ghanaian sectors can take to mitigate the identified impacts?
- How can countries that implement response measures take concerns of affected countries into consideration?
- Formally report these impacts and how can we continue this dialogue, enhance the collaboration between relevant stakeholders and incentivize further exploration and studies on the topic of response measures?

# Methodology for Country Case Study: Ghana

**STEP 1** Describe the country and its characteristics

**STEP 2** Identifying important sectors to the Ghanaian economy

**STEP 3** Identify sectors potentially vulnerable to international response measures

**STEP 4** Identify relevant response measures

NEXT WEBINAR

**STEP 5** Assess the impacts of international response measures

**STEP 6** Look at possible domestic and international tools and support which may be needed to address the impacts

Identifying  
Vulnerable  
Sectors

Identifying  
Response  
Measures

Assessing the  
Impacts



**Thank you!**

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Climate Change and  
Sustainable Transition