IOŚ-PIB

Centre for Climate and Energy Analyses

KOBiZE

# LIFE Climate CAKE PL

# The effects of the implementation of the border tax adjustment on GHG emissions in the context of more stringent EU climate policy until 2030

The Economic Impacts of an EU Carbon Border Adjustment Mechanism
ERCST (14.10.2020)

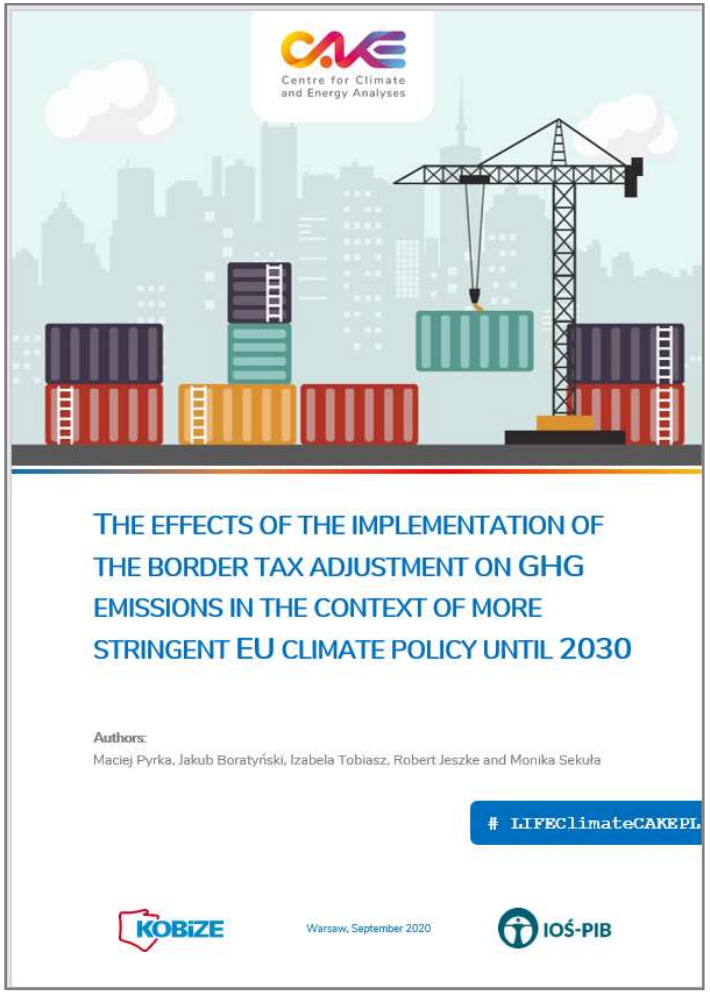
LIFE16 GIC/PL/000031 PROJECT is COFINANCED BY EU UNDER LIFE PROGRAMME
AND BY THE NATIONAL FUND OF ENVIRONMENTAL PROTECTION AND WATER MANAGEMENT

# DESCRIPTION OF THE ISSUES

- New reduction target: 55% by 2030 in relation to 1990
- Demand for measures to protect industrial sectors in EU Member States

The carbon border adjustment mechanism (CBAM)

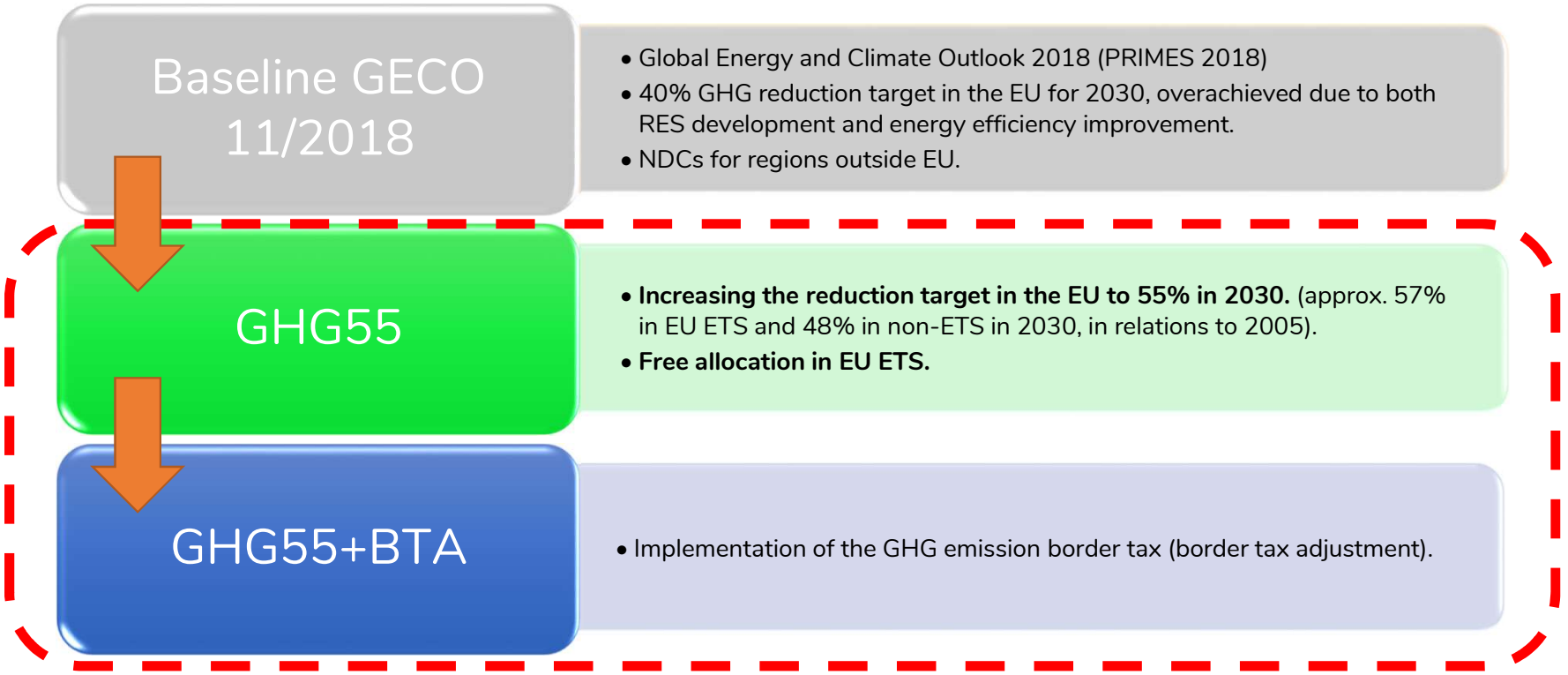
Border tax adjustment (BTA)



# ANALYTICAL TOOLS

- **CGE model –** *Carbon Regulation Emission Assessment Model (CREAM)*
  - Impact assessment of the implementation of $CO_2$ emission tax at the EU borders **in 2030**.
  - Multiregional (35) and multisectoral (31) approach.
  - Includes $CO_2$ emissions from fuels burning as well as process emissions, including – besides $CO_2$ – also $N_2O$ (nitrous oxide), $CH_4$ (methane) and F-gases (fluorinated gases).
  - Covers bilateral trade in goods and services.
  - Macroeconomic outcomes calculated from industry-level results.
- **EU ETS simulation model –** *Carbon Policy Implementation Evaluation Tool (CarbonPIE)*
  - Assessment of the necessary reductions due to changing the targets in the EU ETS.

# SCENARIOS




*Source: own study by CAKE/KOBiZE*
**Commitments of parties to the Paris Agreement (Nationally Determined Contribution)*

# THE DESIGN OF BORDER TAX

## Border tax adjustment

$$BTA_{i,r} = Tax\_rate_{i,r} \cdot Imp_{i,r}$$

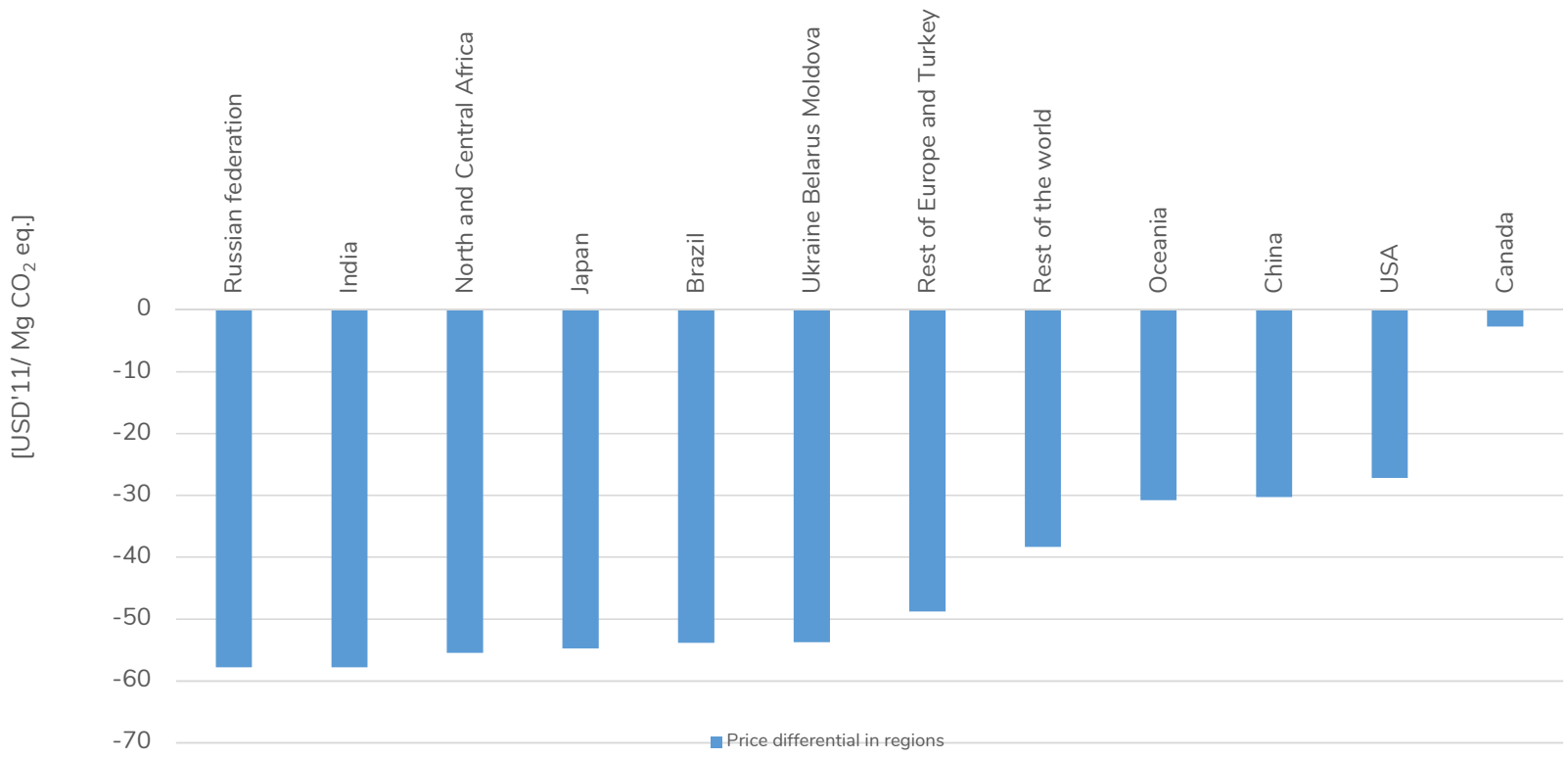
where: i – sectors, r – regions outside the EU, $Tax\_rate_{i,r}$ – the border tax adjustment, $Imp_{i,r}$ – the value of the import

## Tax rate on imports from region *r*

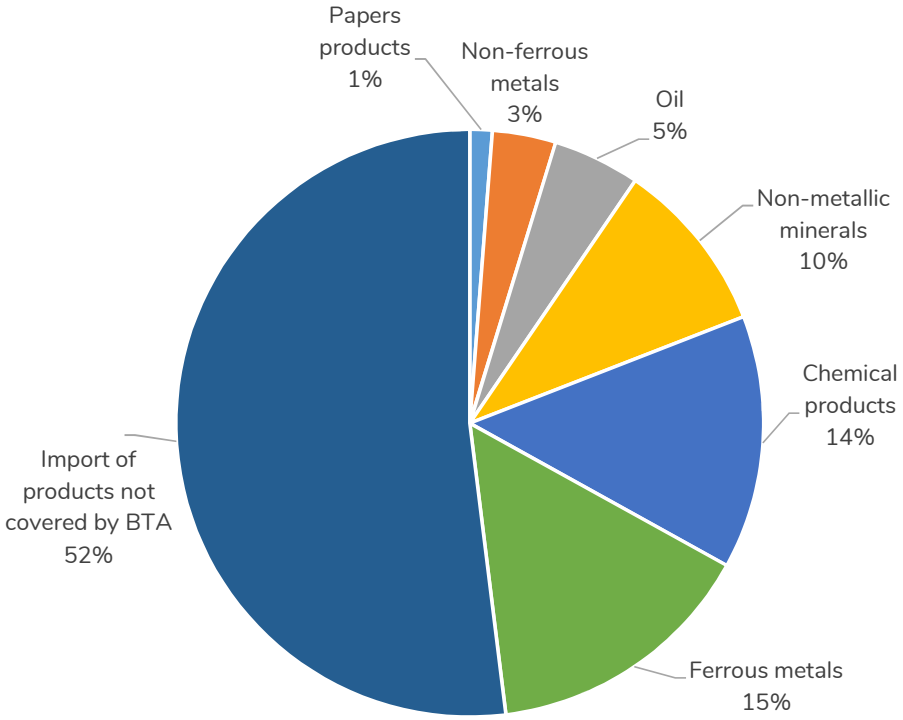
$$Tax\ rate_{i,r} = \frac{GHG\_dir_{i,r} + GHG\_ind_{i,r}}{Prod_{i,r}} \cdot (PGHG_{EU\ ETS} - PGHG_{i,r})$$

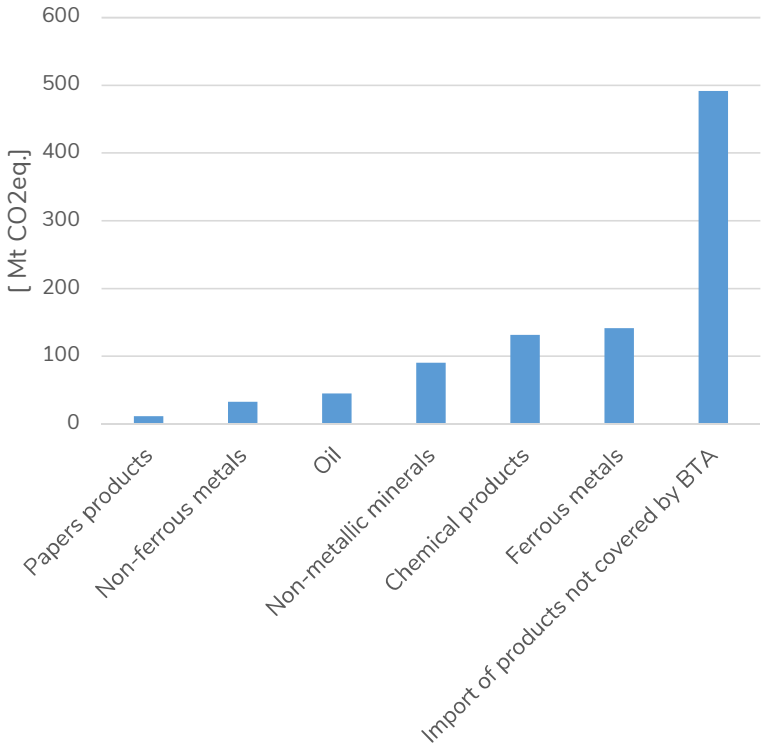
where: $GHG_{i,r}$ $-GHG\_dir_{i,r}$ – the direct GHG emission, $GHG\_ind_{i,r}$ – the indirect GHG emission (related to electricity consumption), $Prod_{i,r}$ – the output, $PGHG_{EU\ ETS}$ – price in the EU ETS, $PGHG_{i,r}$ – the carbon price outside the EU

# DIFFERENCES IN GHG PRICES VERSUS EU, IN USD'11/TONNE IN 2030



# EMISSIONS (DIRECT AND ELECTRICITY-RELATED) EMBODIED IN IMPORTS TO EU, GHG55 2030



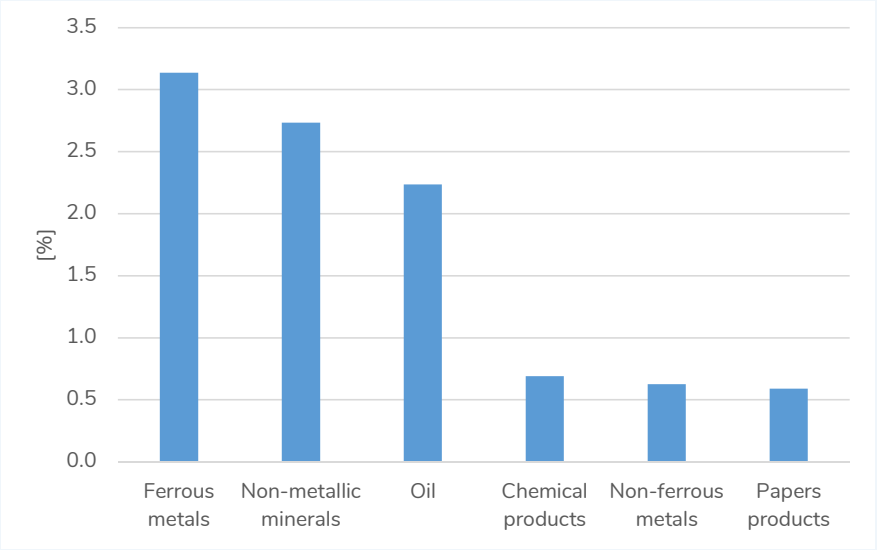
# SECTORS SUBJECT TO BORDER TAX

## Sectors covered by border tax:

- **Oil products** (refined petroleum products and coke)
- **Chemical production**
- **Non-metallic minerals** (cement, lime, gypsum and glass)
- **Paper industry**
- **Iron and steel**
- **Non-ferrous metals** (aluminium)

## Average border tax shares in the value of imports for the EU27 in 2030

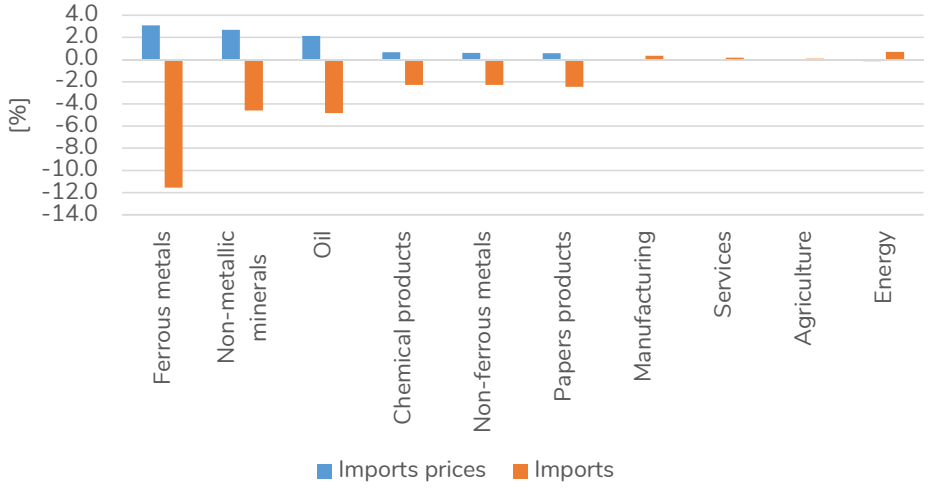
- **Border tax** in relation to the import net value is **2-3%** for iron and steel, non-metallic minerals and petroleum products, and **0.6-0.7%** for non-ferrous metals, chemical products and paper industry.

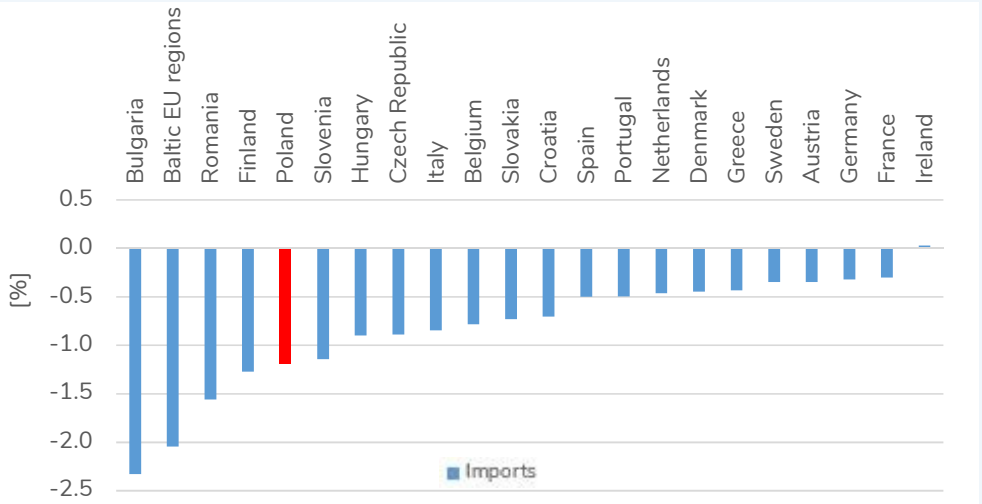



*Source: own study by CAKE/KOBiZE*

# IMPACT ON PRICES AND VOLUMES OF IMPORTS FROM OUTSIDE THE EU IN 2030

- The largest **declines in imports** to the EU UE appear in sectors: iron and steel – by **11.6%**, petroleum products (oil refining) – by 4.8%, and non-metallic minerals (e.g. glass production) – by 4.6%.
- The total decline in imports to the EU amounts to approx. **0.5%** and is quite diversified between EU Member States, the largest decrease in imports occurs in Bulgaria (**2.3%**).

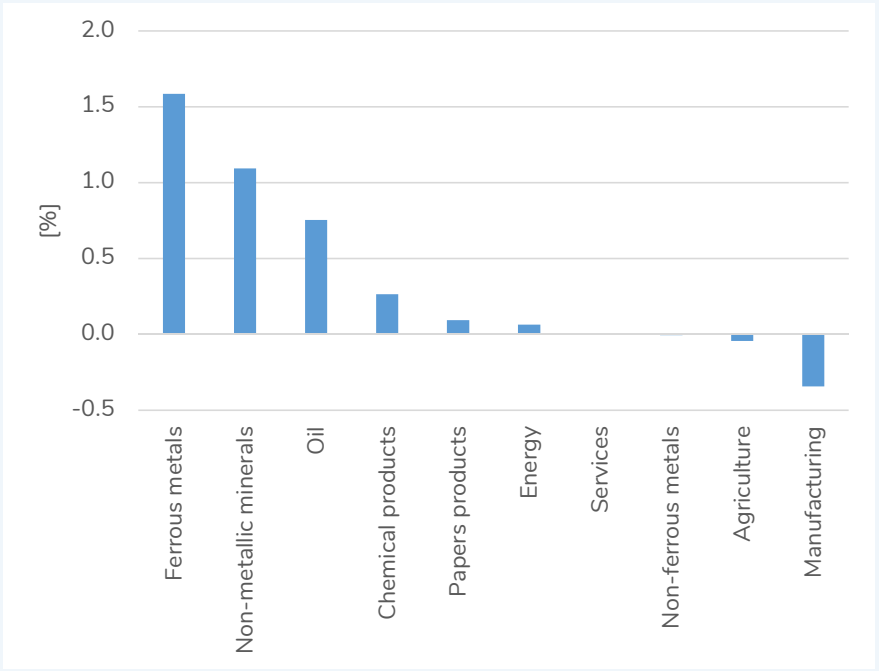


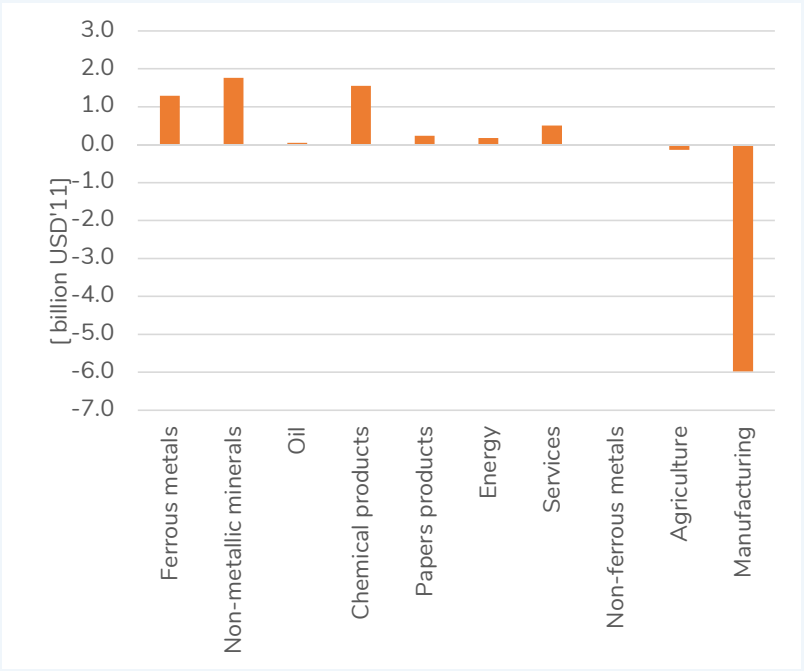




*Source: own study by CAKE/KOBiZE*

# The impact of the output by sector in EU Member States in 2030

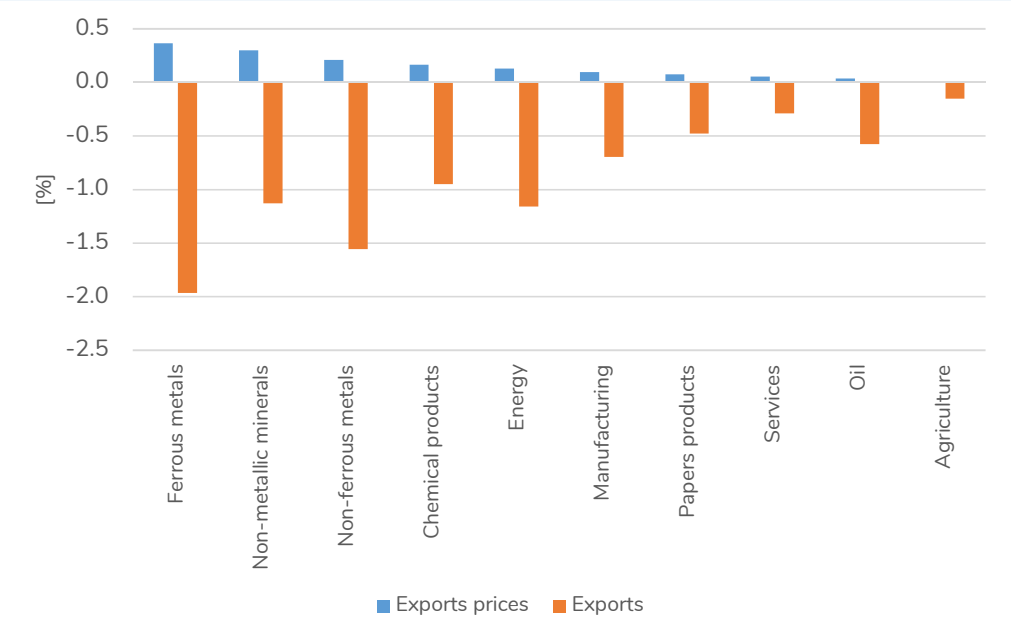
- **The increase in production in the EU** in the sectors covered by border tax (except for non-ferrous metals), which was mainly the result of replacing imports with domestic production.




*Source: own study by CAKE/KOBiZE*

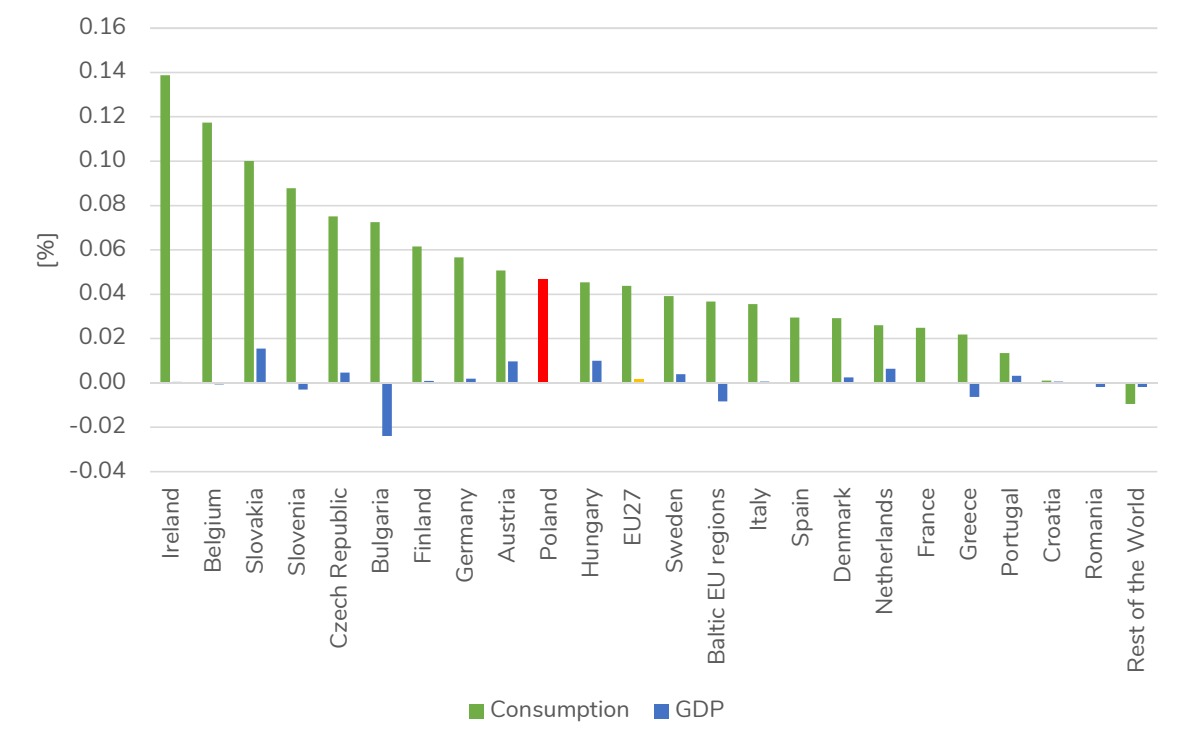
# THE IMPACT ON PRICES AND THE VOLUME OF EU EXPORTS TO THE OTHER REGIONS IN 2030




- The introduction of the border tax adjustment causes a slight increase in prices and decrease in exports.
- Exports also fall in the sectors which are not covered by the border tax adjustment.

*Source: own study by CAKE/KOBiZE*

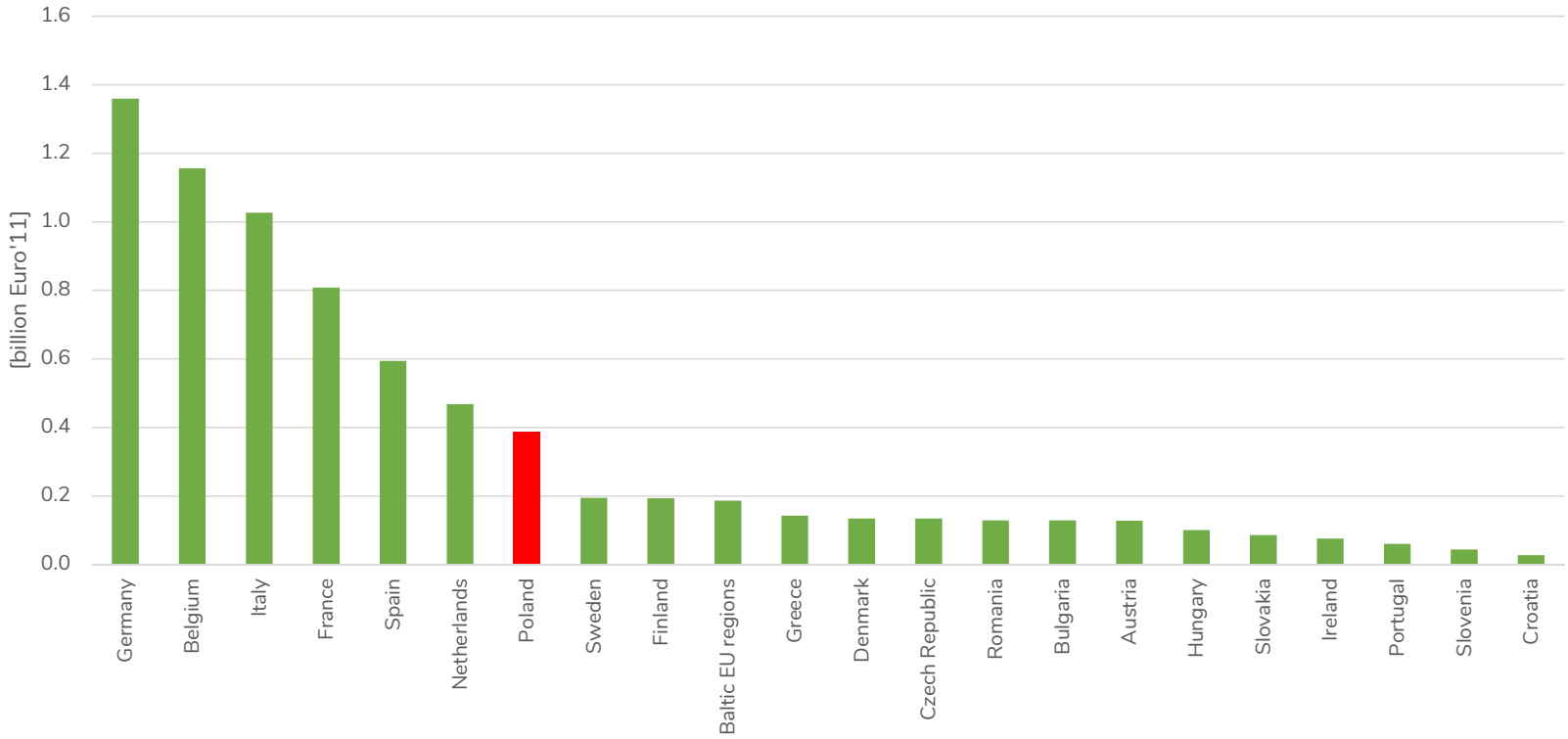
# GDP/CONSUMPTION IN THE EU IN 2030




*Source: own study by CAKE/KOBiZE*

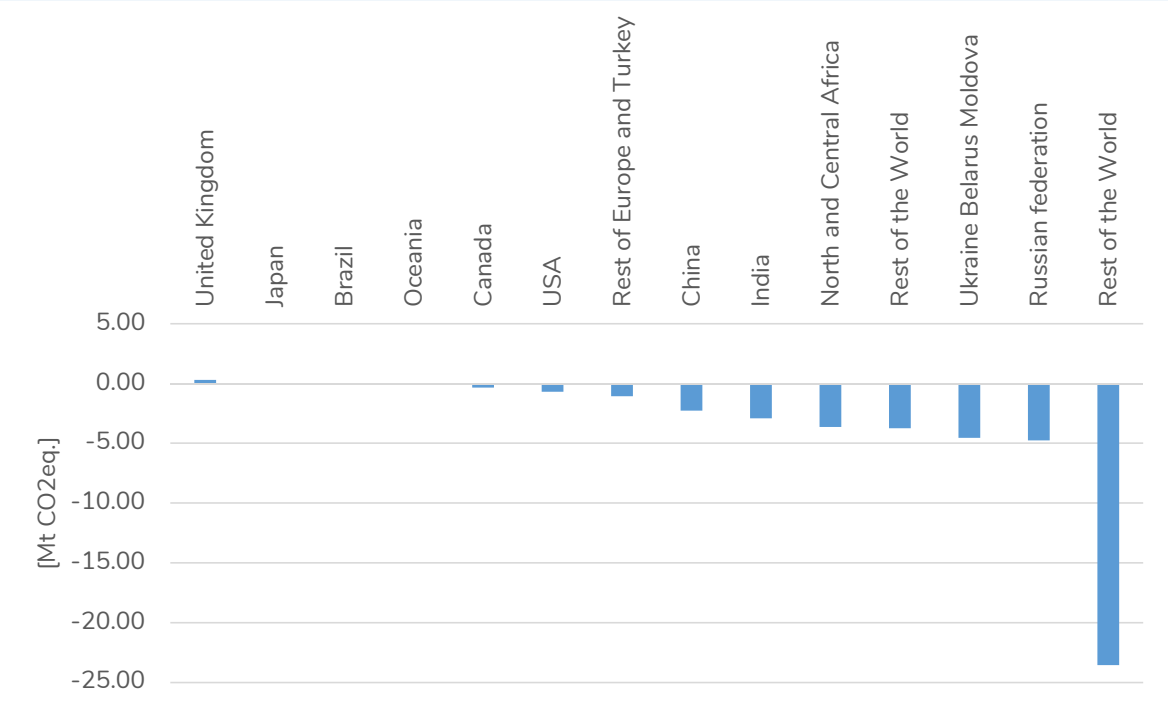
- Implementing the emission border tax causes a **slight increase in household consumption** in the EU Member States.
- The average increase in household consumption in the EU is **0.04%** while the highest occurs in Ireland (0.14%) and Belgium (0.12%).
- Consumption effects driven by terms of trade improvement.
- But note: no possible productivity deterioration from trade protection taken into account.

# REVENUES IN 2030 FROM BORDER TAX, EURO'11 BLN




*Source: own study by CAKE/KOBiZE*

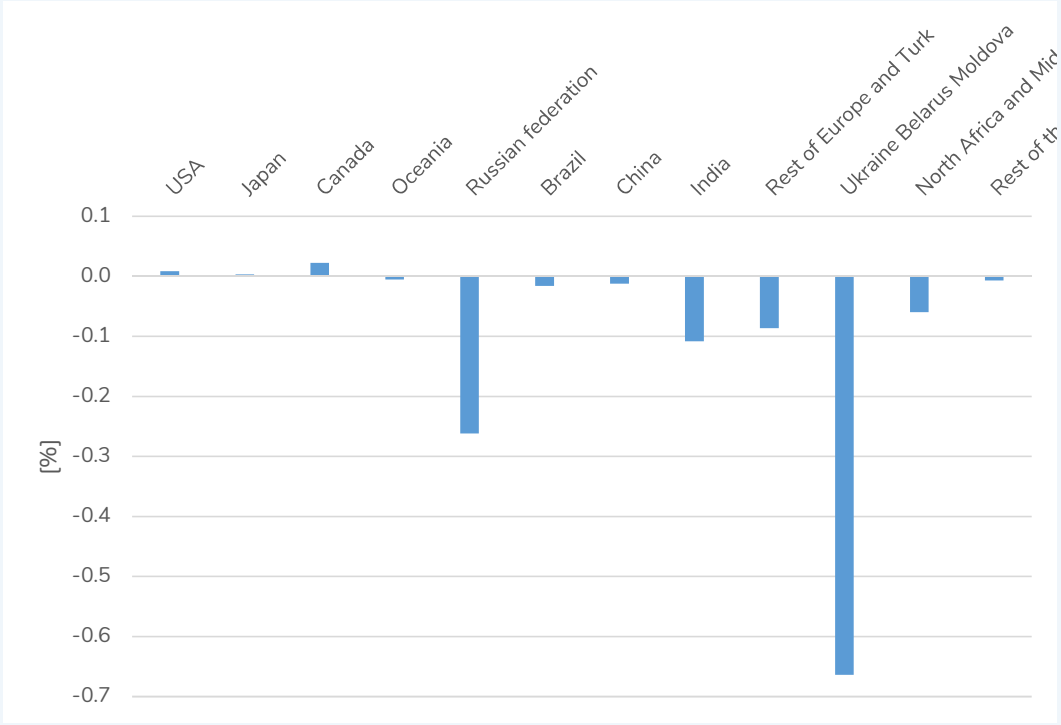
# THE GLOBAL GHG EMISSIONS REDUCTION IN 2030




- Total emissions in all regions of the world are reduced by approx. **24 Mt** $CO_{2eq.}$ in 2030.
- This represents approx. **10%** of the additional reduction efforts that must by achieved in EU ETS sectors after the reduction target is changed from 40% to 55% in 2030.

*Source: own study by CAKE/KOBiZE*

# IMPACT OF BORDER TAX ON EXPORT IN REGIONS OUTSIDE THE EU




- Introduction of the border tax adjustment has the greatest impact on the region of Russia and the region of Ukraine, Belarus and Moldova (UBM).
- Still, impacts are rather minor.

*Source: own study by CAKE/KOBiZE*

# Conclusion

- **Economic impacts:**
  - **Increase in production in the EU** in Energy-intensive sectors (**1.6%** ferrous metals; **1.1%** non-metallic minerals).
  - **The revenues to the budget -** the border tax adjustment within the EU will bring in 2030 additional revenues estimated at about **EUR 7.6 billion (USD 10.6 billion).**
  - **Minor macroeconomic impact -** slight increase of household consumption in the EU, by about 0.1%, due to the improved terms of trade (but no negative impact of protection on productivity considered).
- **Environmental impacts:**
  - **A reduction in the global GHG emissions** (also under the conditions of free allocation of emission allowances in the EU ETS) - **24 Mt CO2 eq.** reduction in the global GHG emissions.
- **Issues:**
  - **Restricting BTA to energy-intensive goods -** may indirectly impair manufacturing through higher cost.
  - **Design hinging on assessment of marginal abatement cost** in countries not subject to emission trading, given their NDCs.

# Thank you!

## CAKE Team

## LIFE Climate CAKE PL

**The National Centre for Emissions Management (KOBiZE)/Institute of Environmental Protection – National Research Institute (IOS-PIB)**

**www.climatecake.pl**

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