



ODYSSEE-MURE National Workshop Switzerland

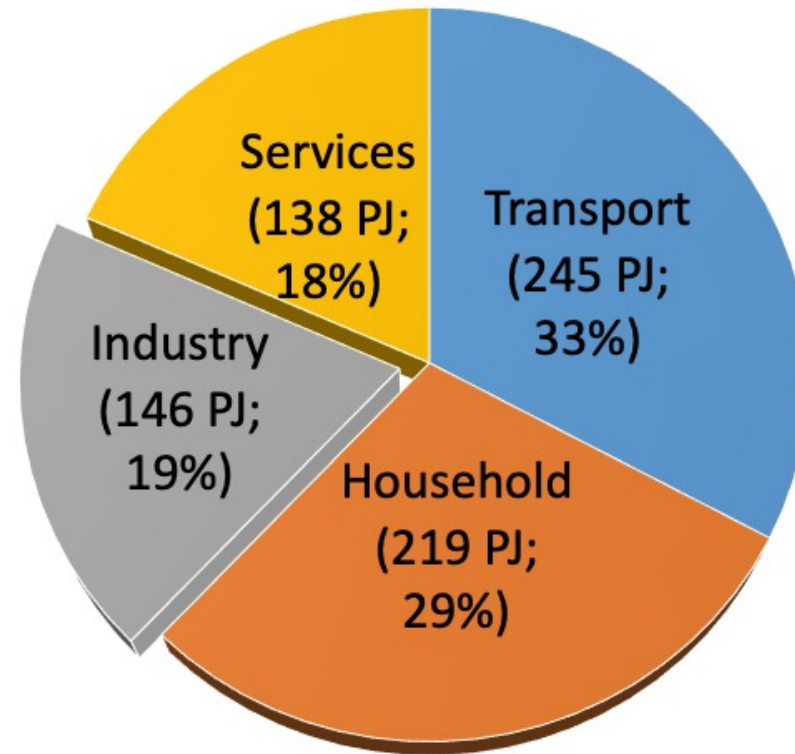
*Energy efficiency indicators
for Industry*



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Industry sector



Share of end-use sectors within Switzerland TFE (SFOE,2020)

Introduction: Industry ODEX

Industry ODEX:
*Aggregated using
energy shares*

Energy efficiency indices for sub sectors:
*ratio of **energy consumption** and **activity**
indicator*

Data from national statistics:

- **Total final energy consumption** &
- **Activity indicators: Physical production** (homogeneous sub-sectors), **production index** (heterogenous sub-sectors)

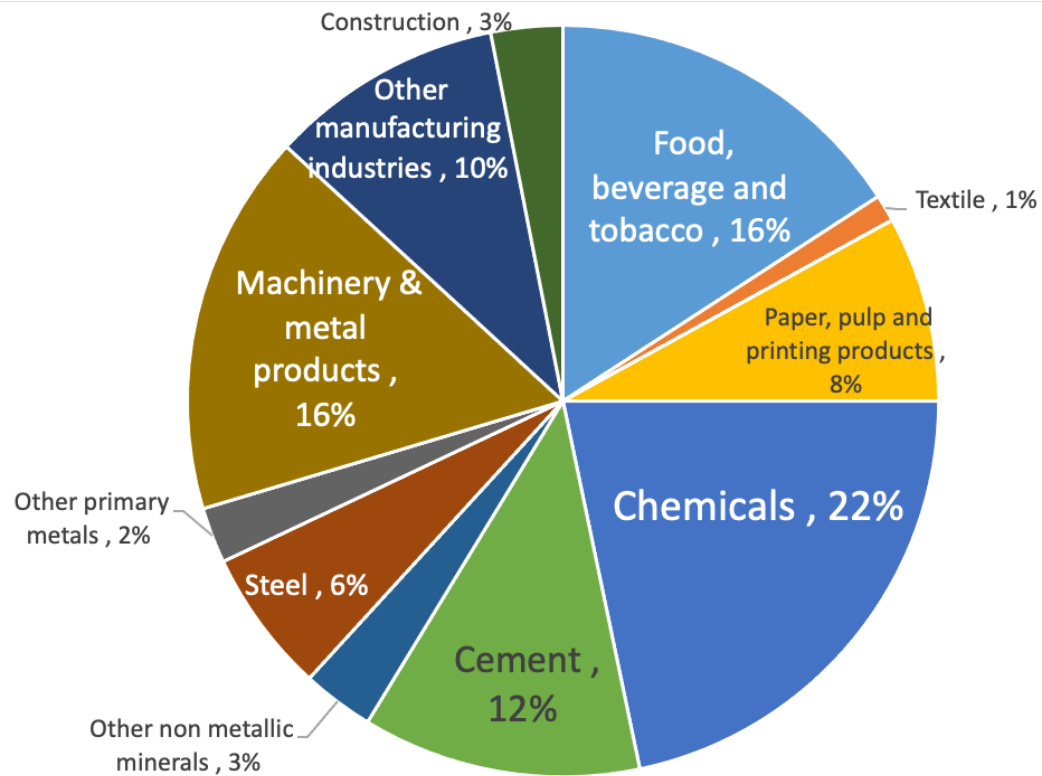
Manufacturing (12 sub-sectors)

- Homogeneous: Cement, Iron and Steel, Pulp & paper
- Heterogenous: Food, chemicals, electronics, machinery & fabricated metals, textile, non-ferrous metals, other non-metallic minerals, transport equipment, wood product, other manufacturing

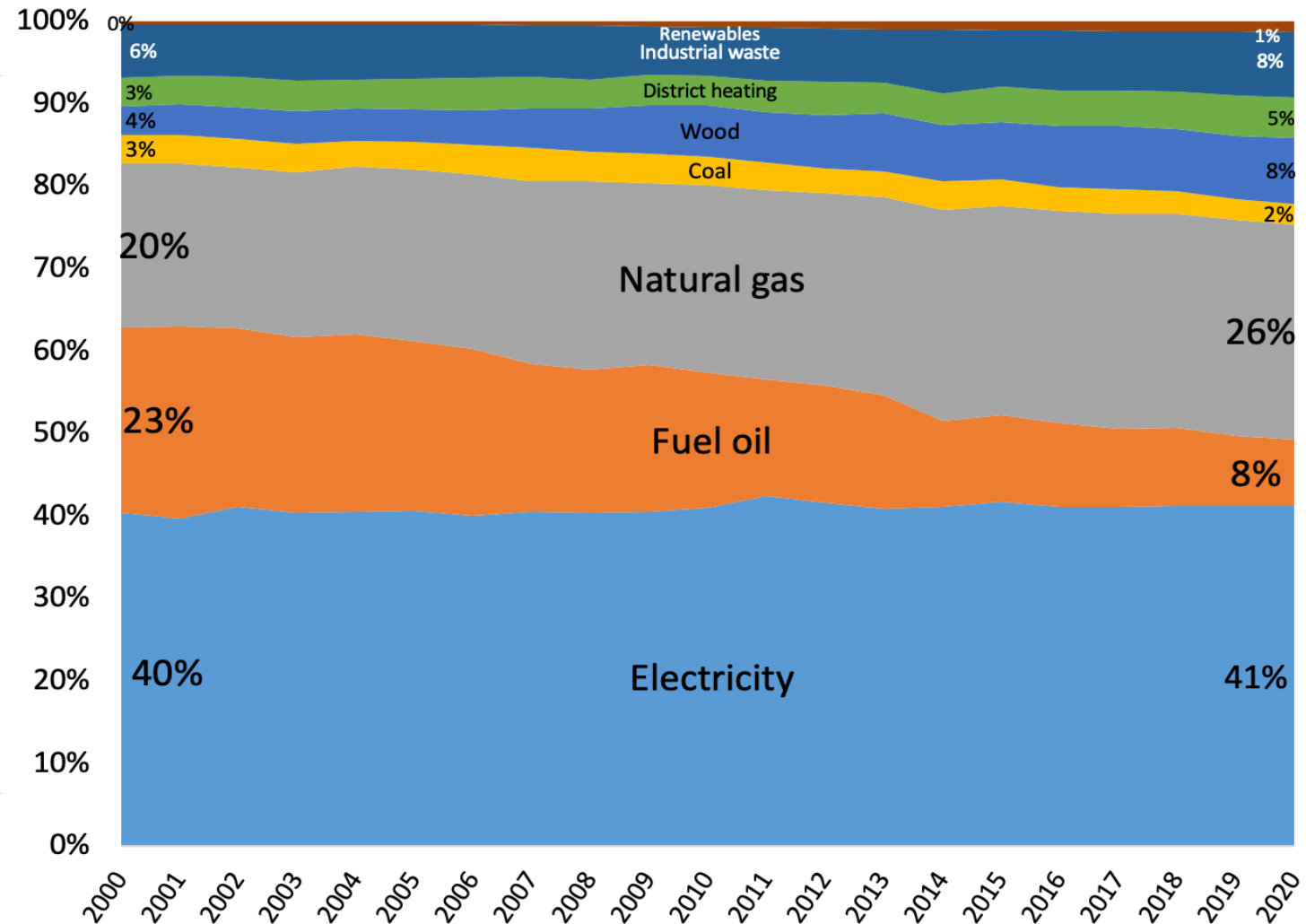
Other industry (2 sub-sectors):

- Construction, mining

Industry: Overview

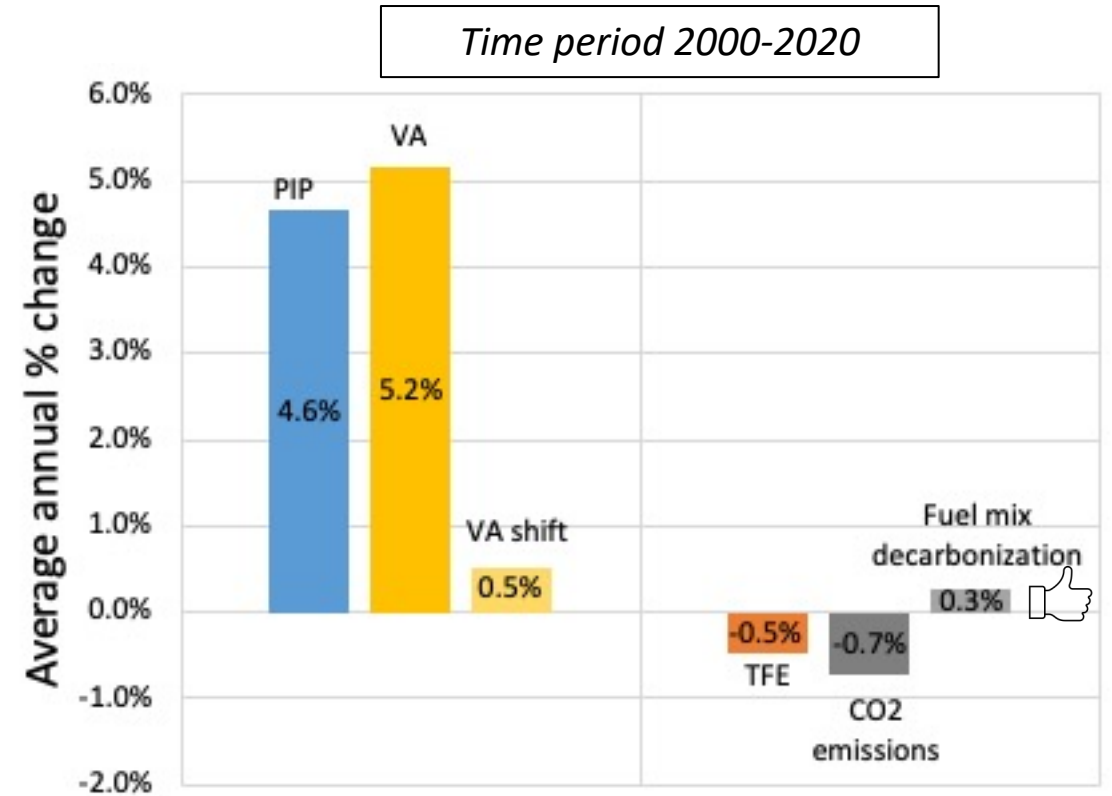
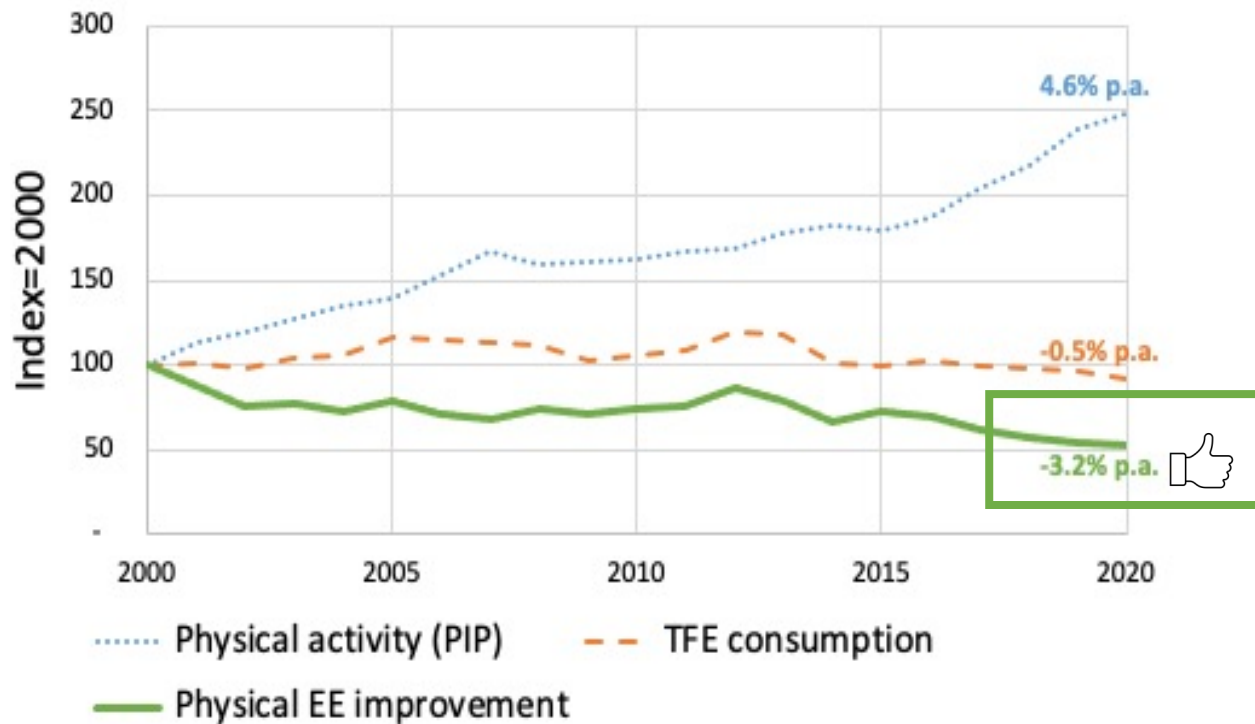


Share of industry subsectors within industry TFE (SFOE, 2020)



Development of energy carrier shares (Source:SFOE, 2020)

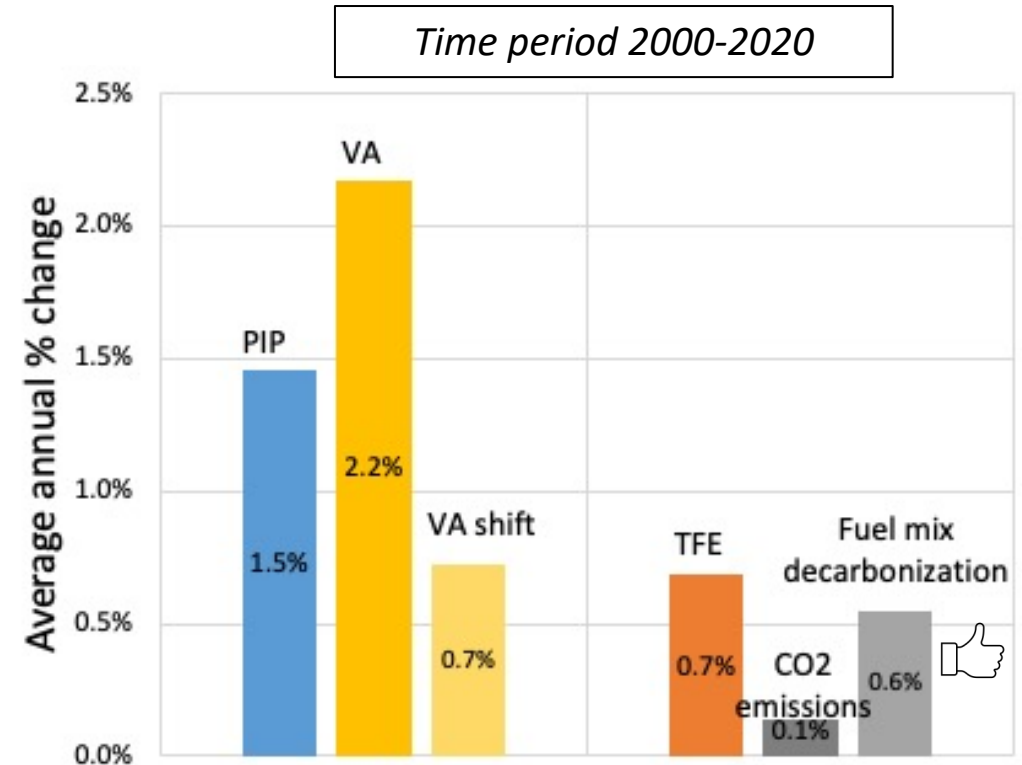
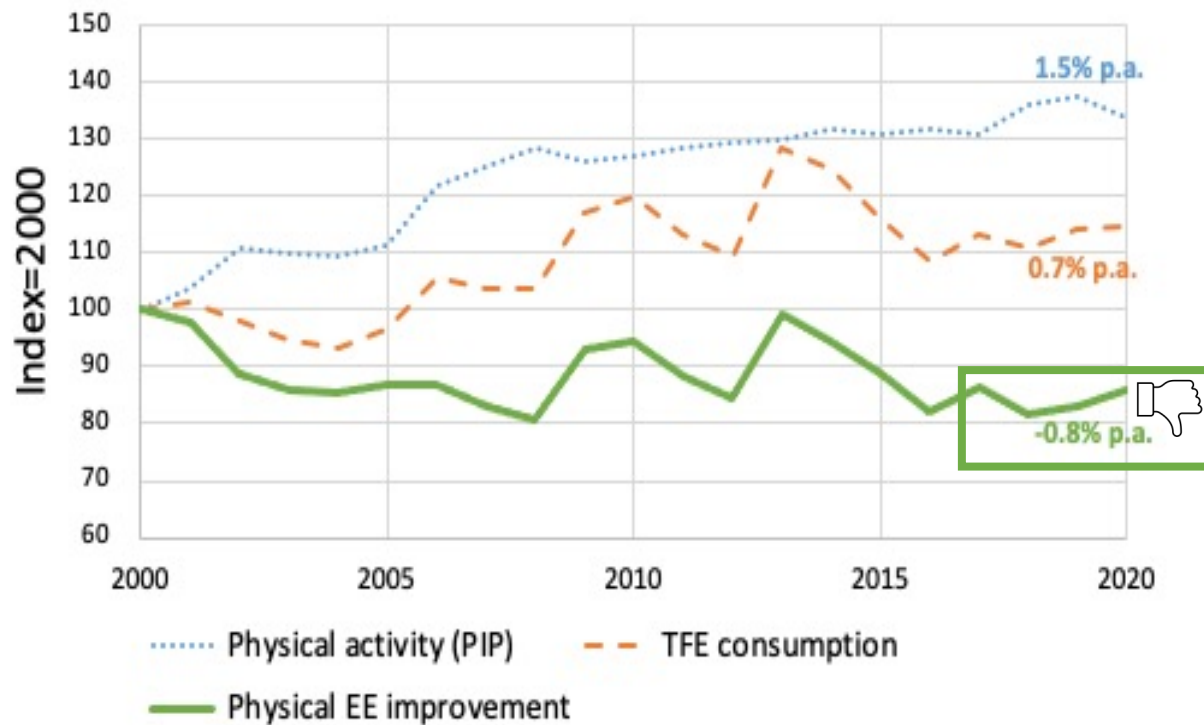
Chemicals manufacturing (22% of industry TFE)



- Physical activity → Measured using production index proxy (PIP) estimated by deflating turnover using price indices.
- Fuel mix decarbonization → Rate of change of t-CO₂ emitted per TJ of TFE consumed

Sources: FSO (2020), SFOE (2020), EEA (2020)

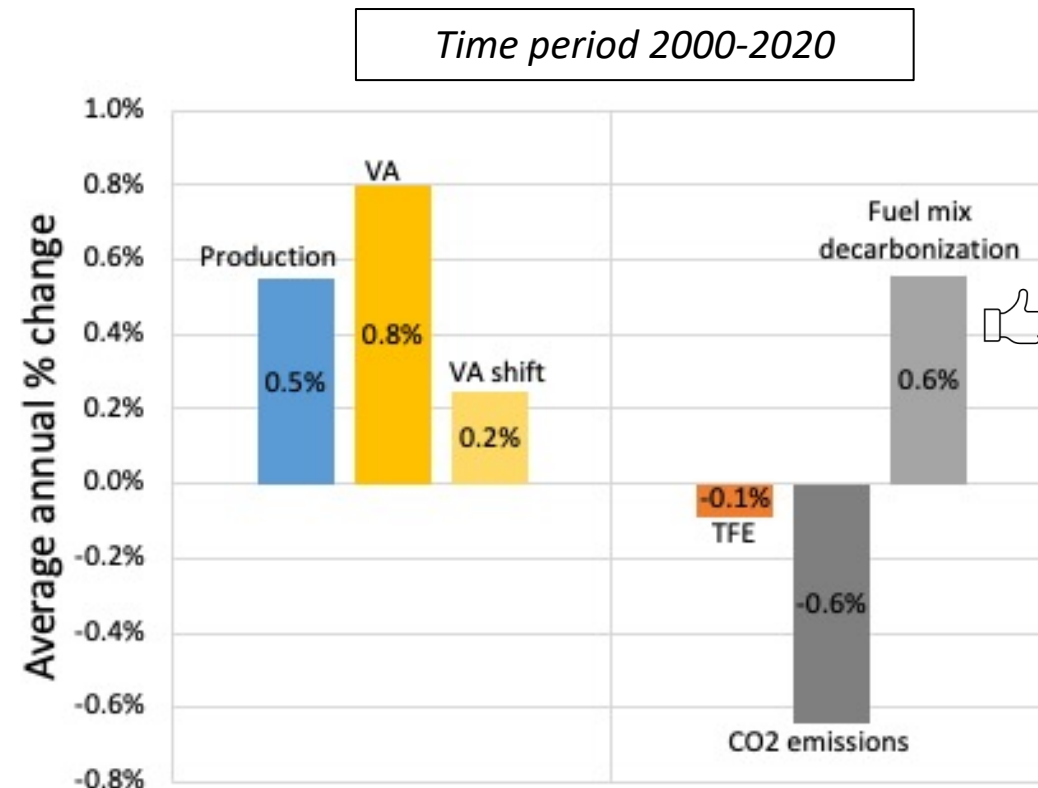
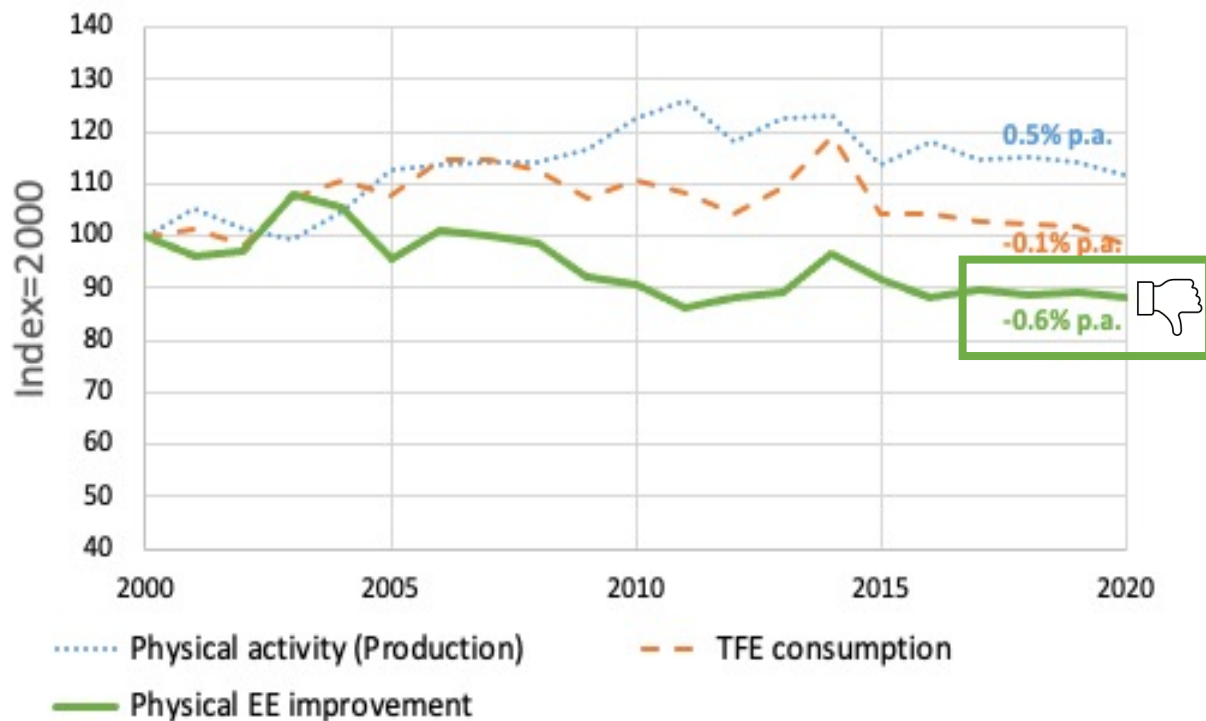
Food and beverage (16% of industry TFE)



- Physical activity → Measured using production index proxy (PIP) estimated by deflating turnover using price indices.
- Fuel mix decarbonization → Rate of change of t-CO₂ emitted per TJ of TFE consumed

Sources: FSO (2020), SFOE (2020), EEA (2020)

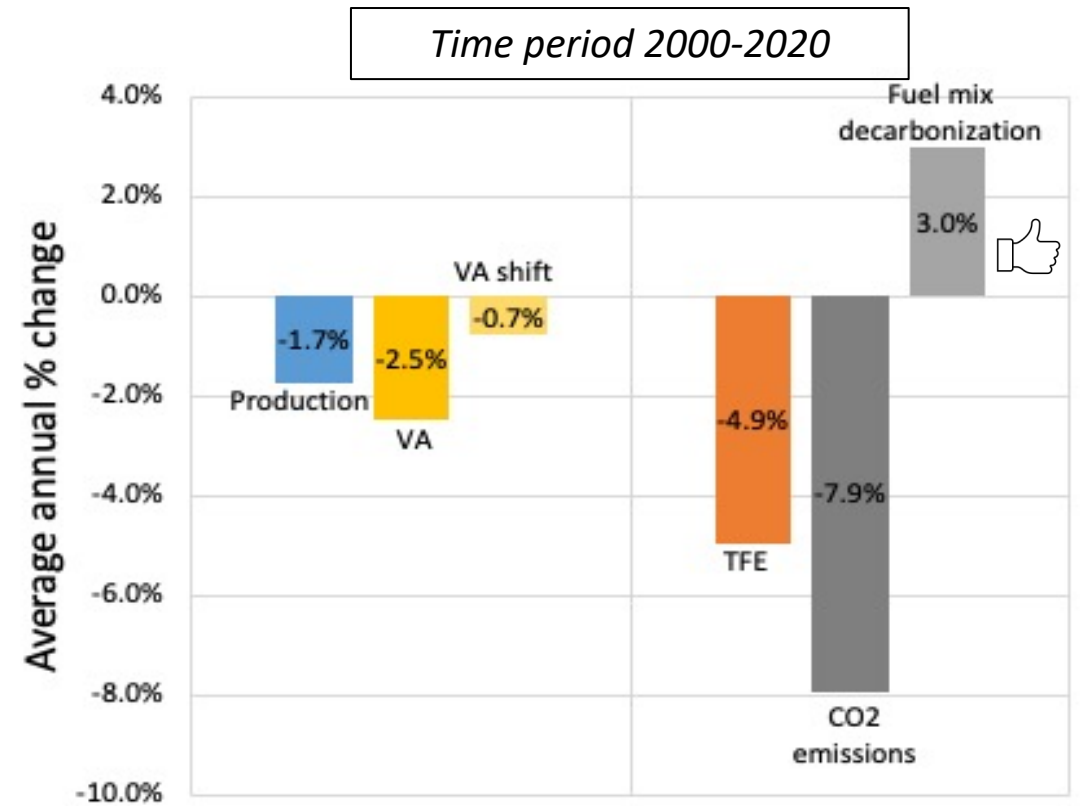
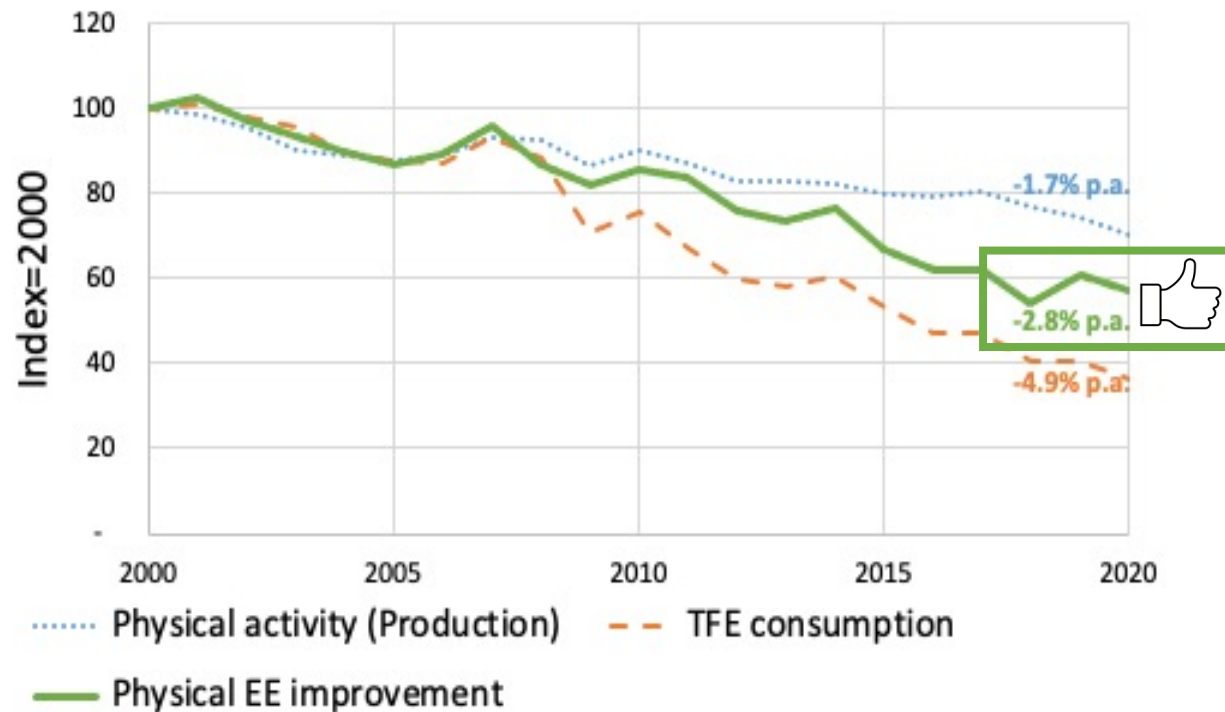
Cement manufacturing (12% of industry TFE)



- Physical activity → Measured as variation in physical production (i.e., tonne of cement).
- Fuel mix decarbonization → Rate of change of t-CO₂ emitted per TJ of TFE consumed

Sources: FSO (2020), SFOE (2020), EEA (2020)

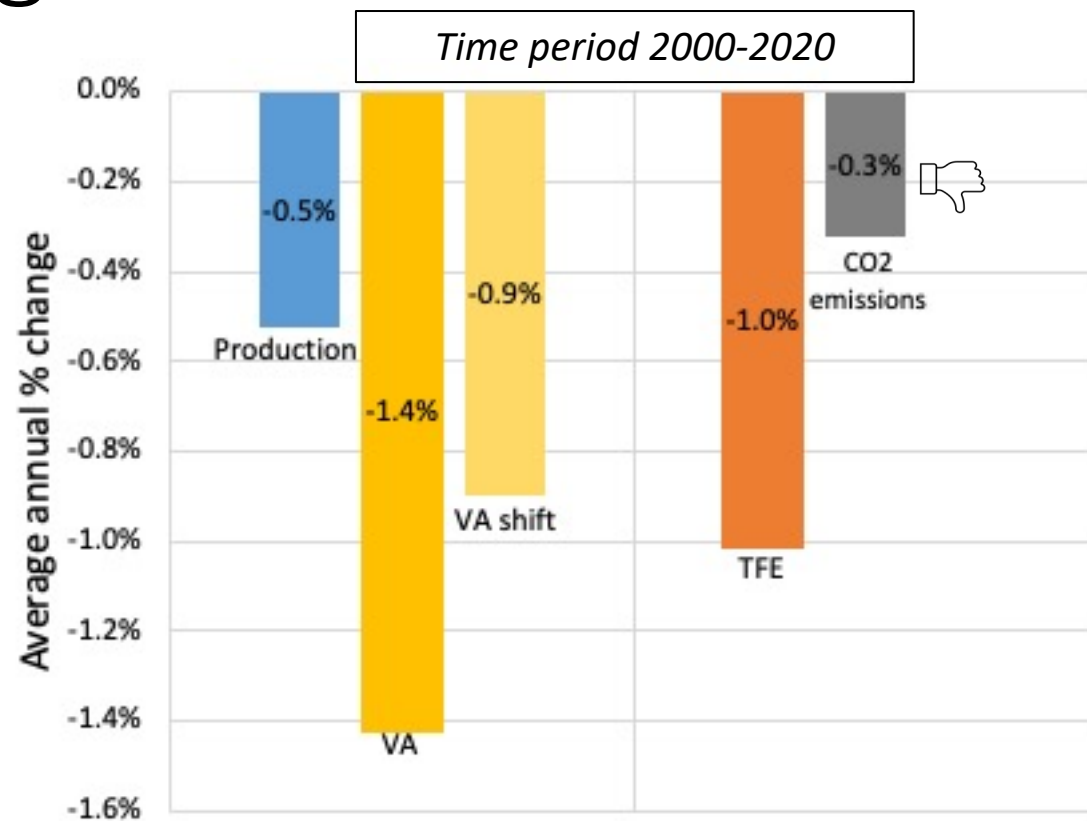
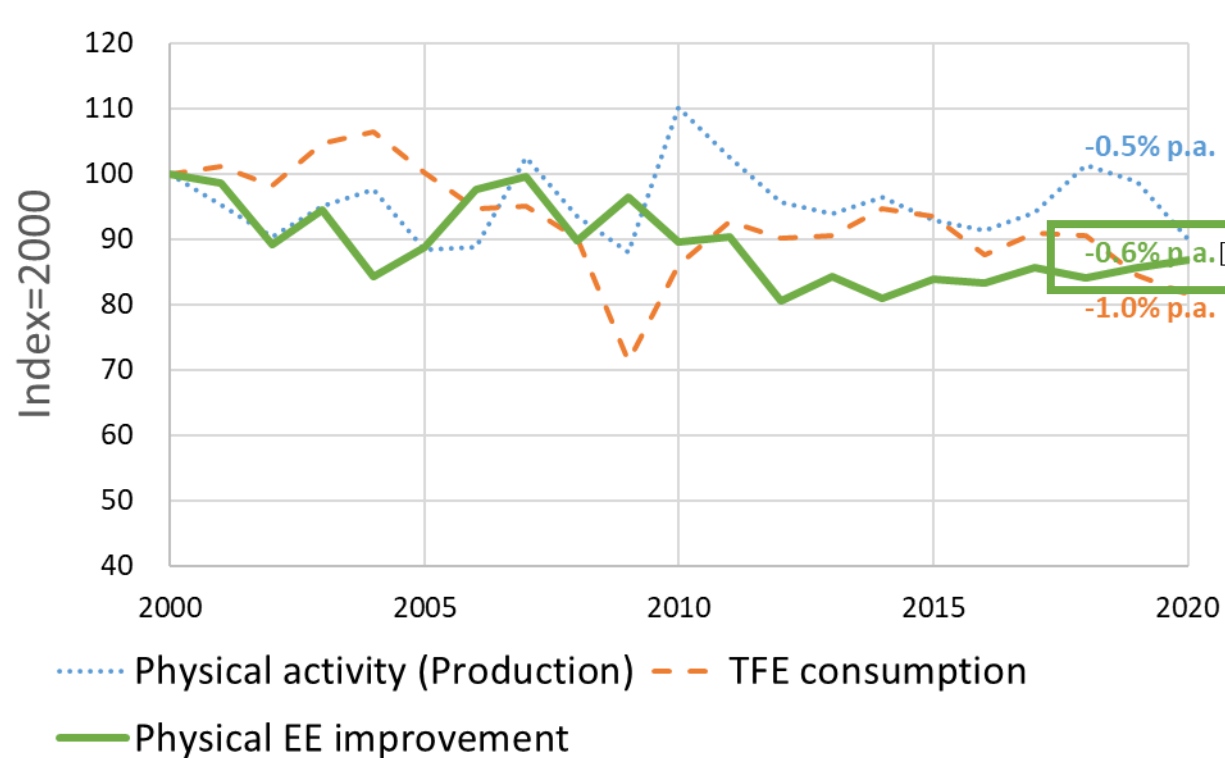
Paper manufacturing (8% of industry TFE)



- Physical activity → Measured as variation in physical production (i.e., tonne of paper).
- Fuel mix decarbonization → Rate of change of t-CO₂ emitted perTJ of TFE consumed.

Sources: FSO (2020), SFOE (2020), EEA (2020)

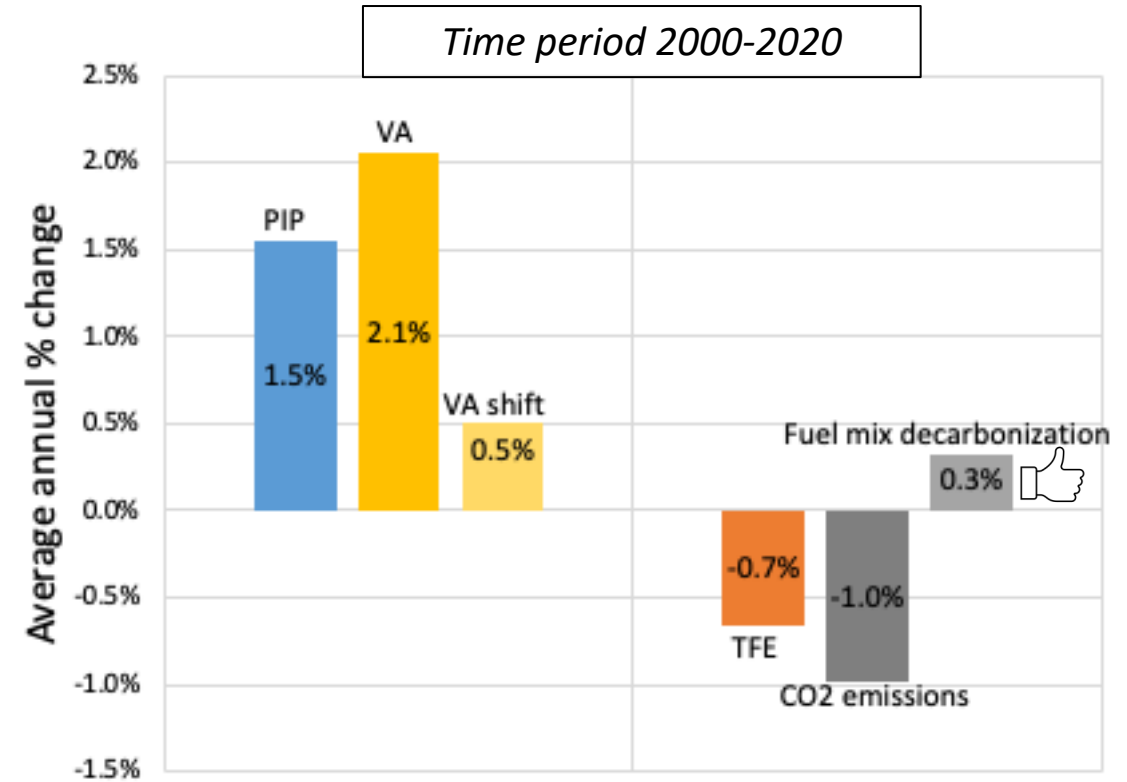
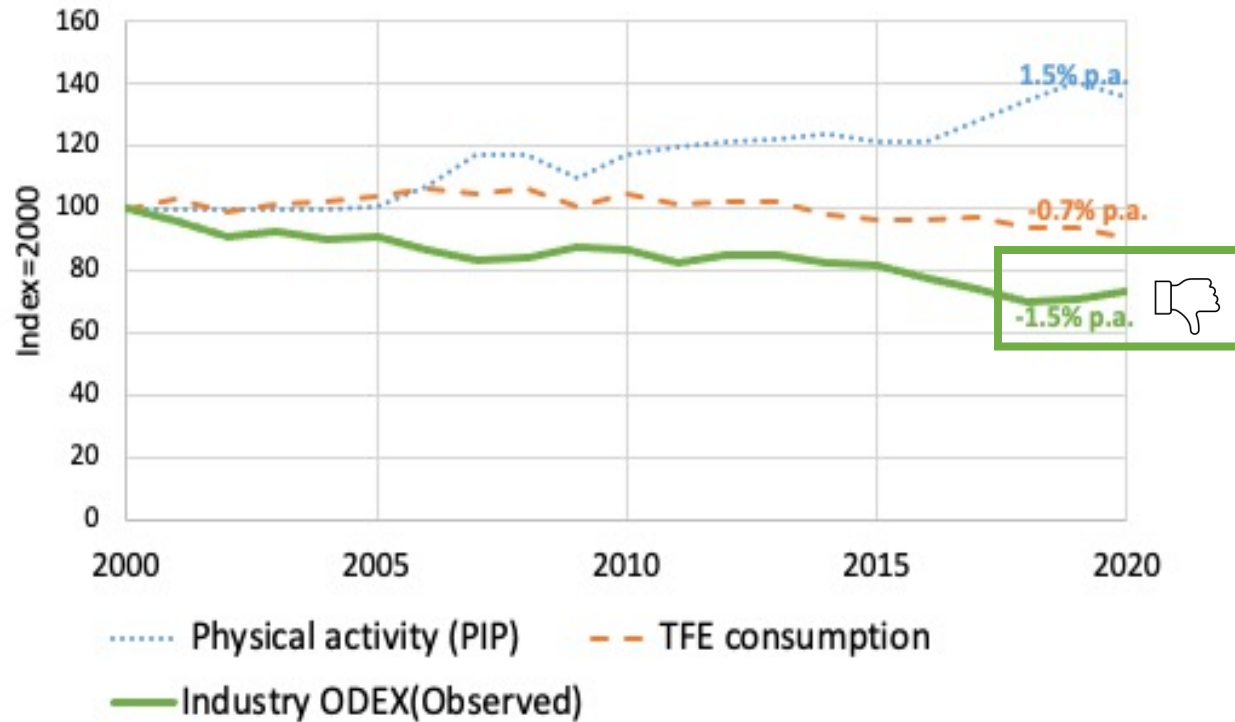
Primary metals manufacturing (8% of industry TFE)



- Physical activity → Measured as variation in physical production (i.e., tonne of steel).
- Fuel mix decarbonization → Rate of change of t-CO₂ emitted per TJ of TFE consumed.

Sources: FSO (2020), SFOE (2020), EEA (2020)

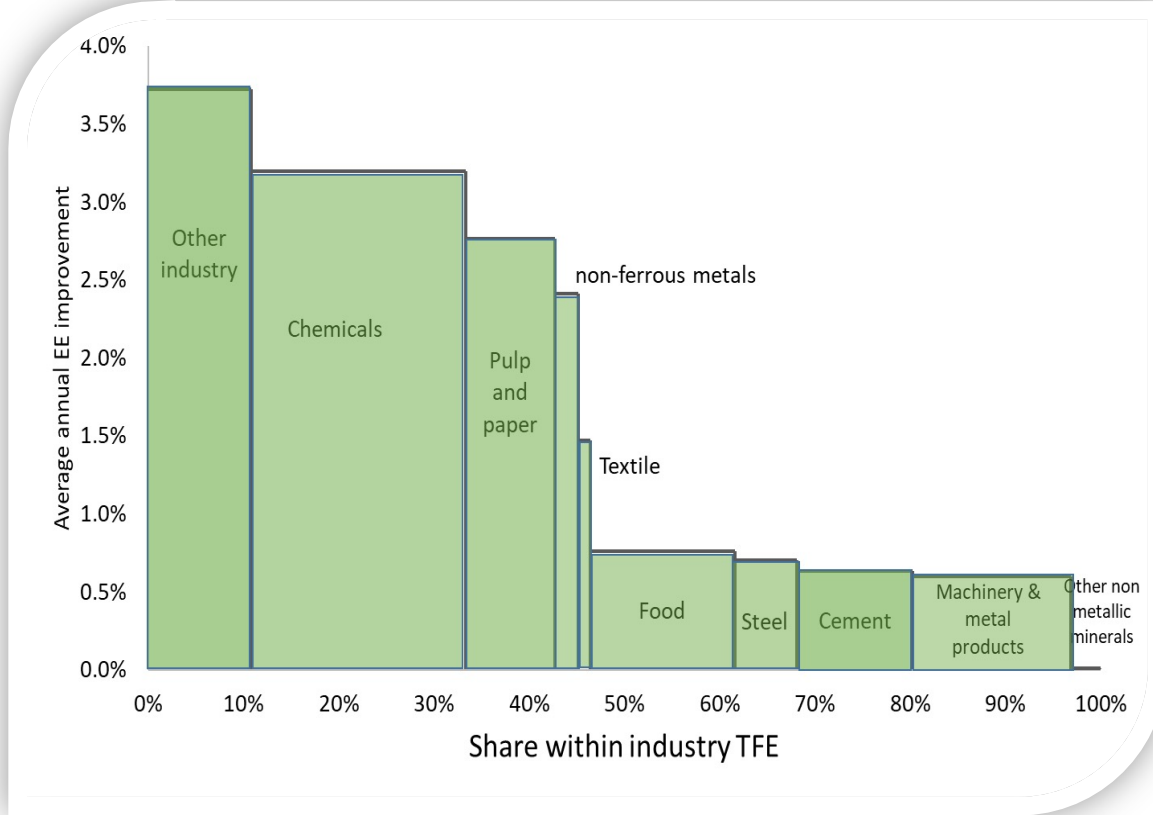
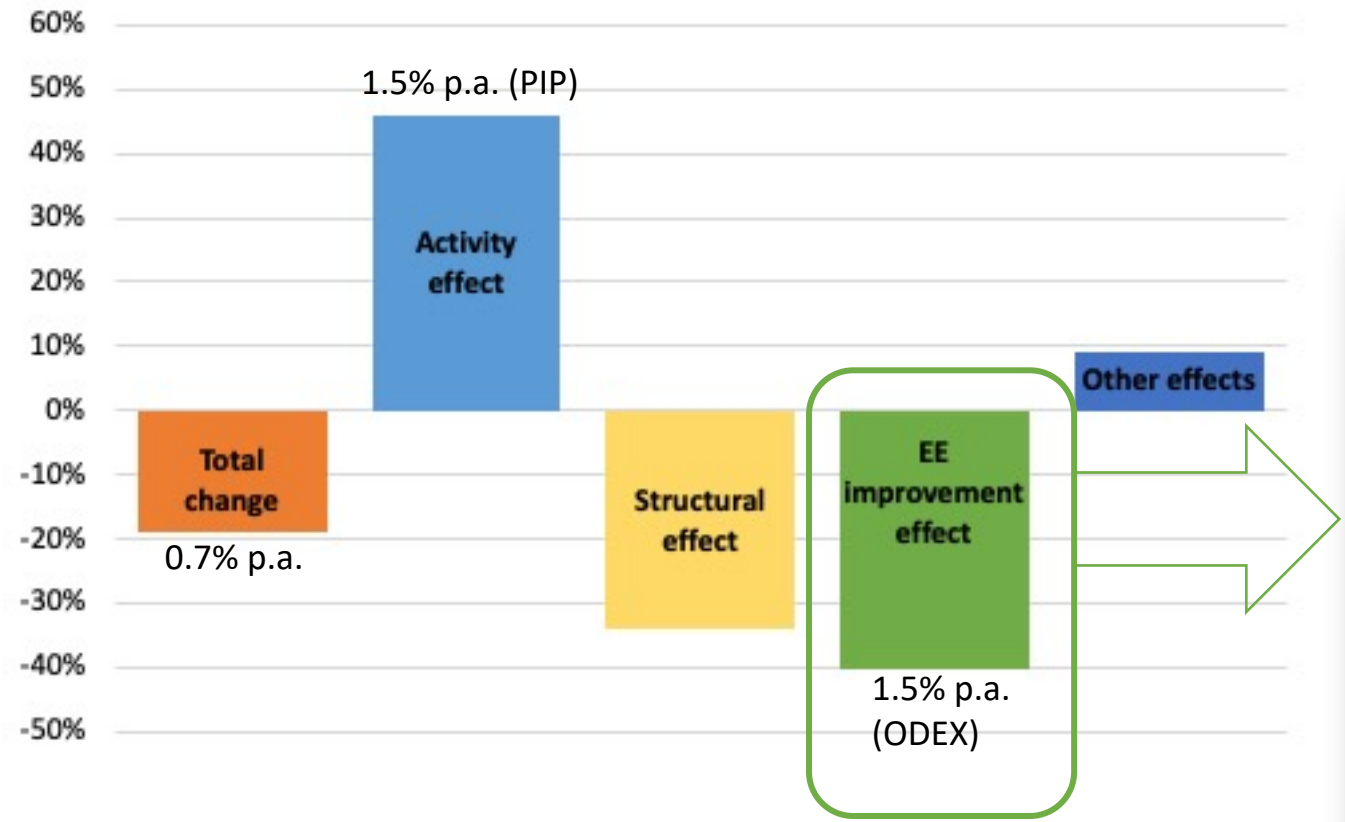
Total Industry



- Physical activity → Measured using production index proxy (PIP) estimated by deflating turnover using price indices.
- Fuel mix decarbonization → Rate of change of t-CO₂ emitted per TJ of TFE consumed.

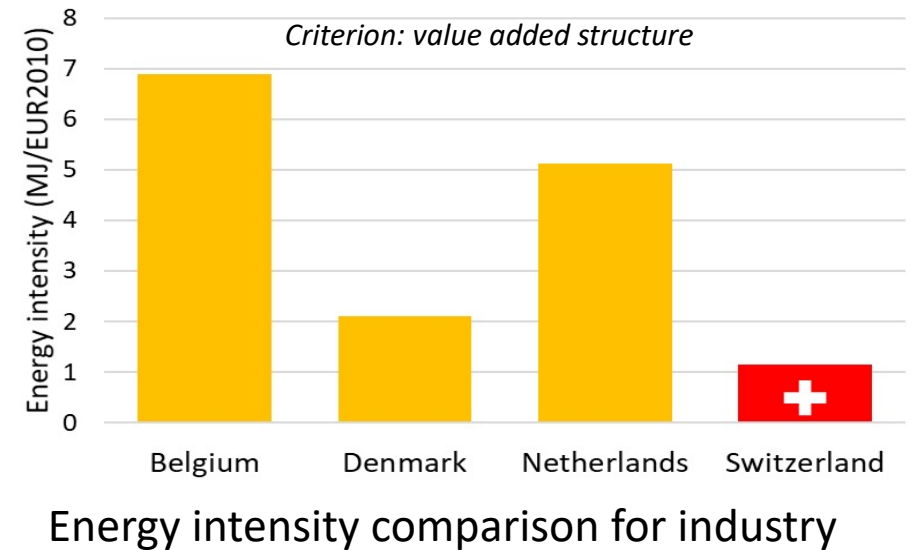
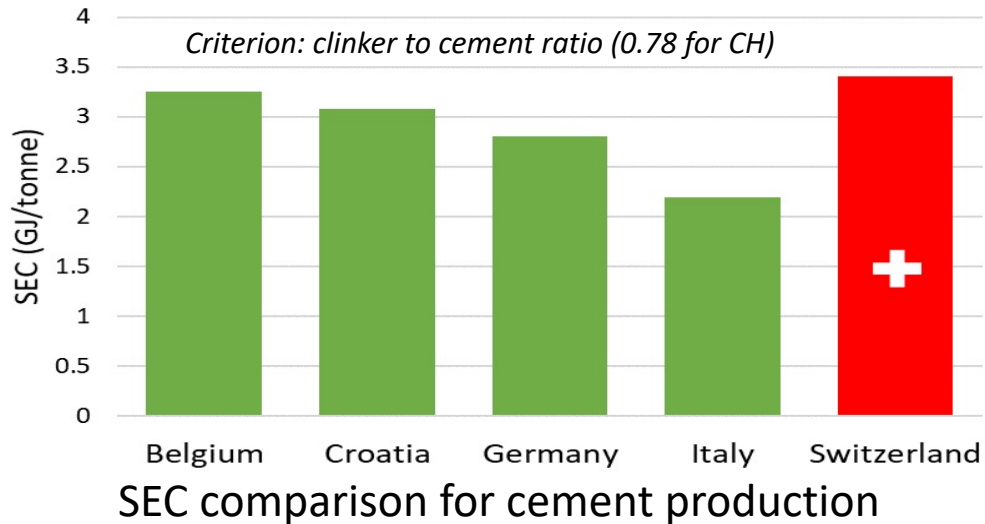
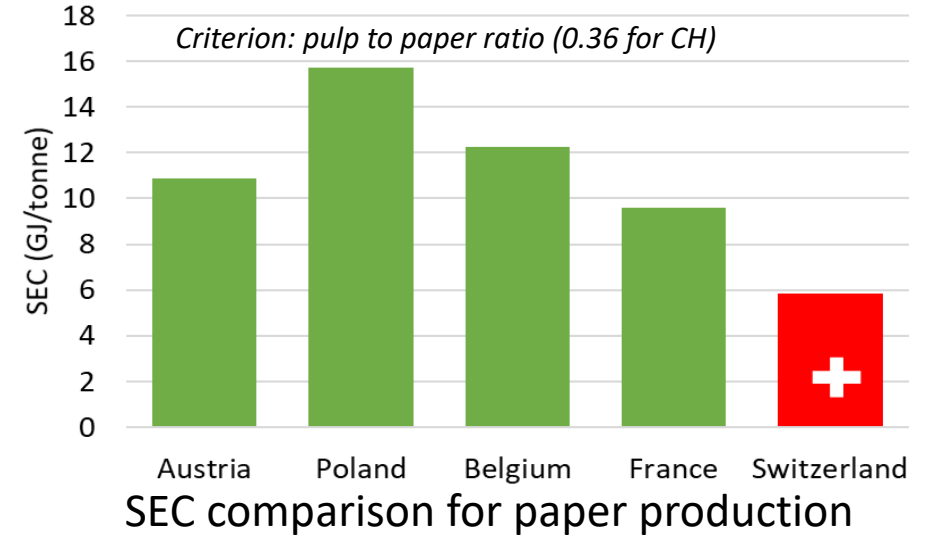
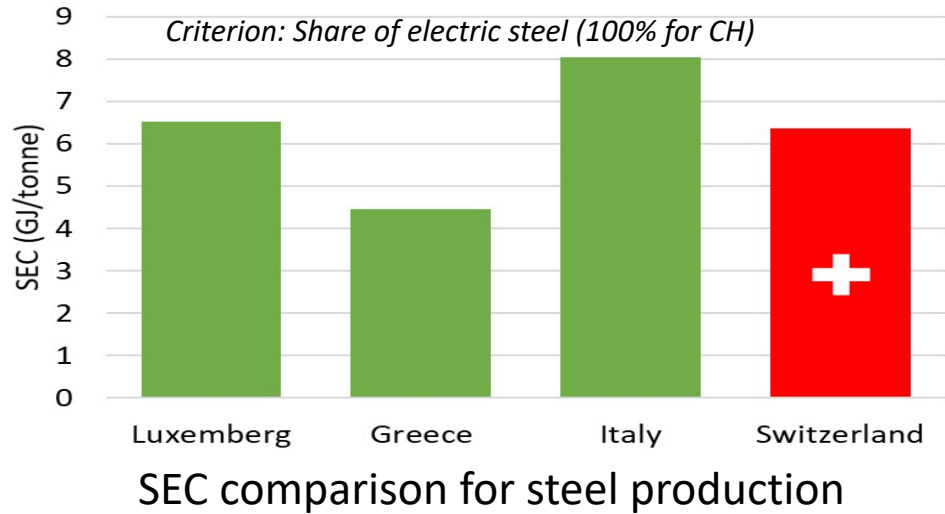
Sources: FSO (2020), SFOE (2020), EEA (2020)

Decomposition analysis: Industry TFE (2000-2020)



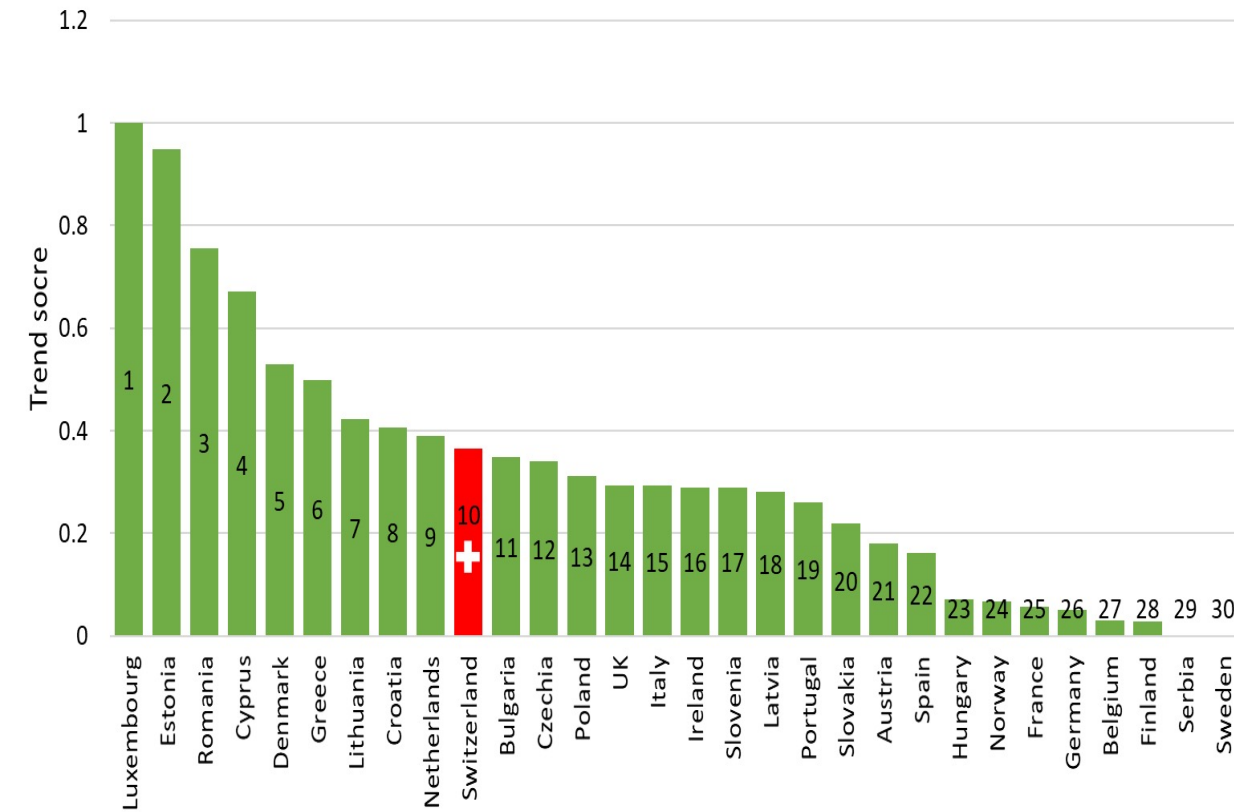
Sources: ODYSSEE-MURE decomposition tool (2019)

Cross-country comparison (2019)

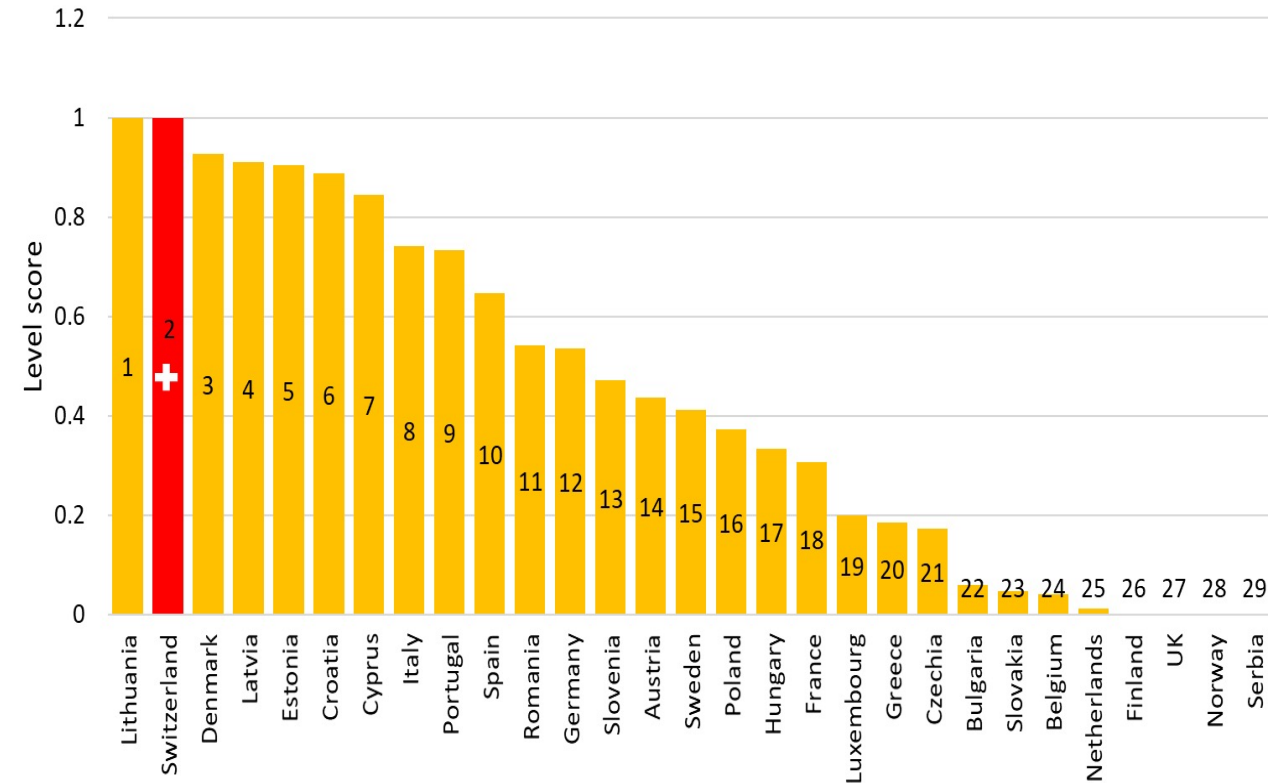


Sources: ODYSSEE-MURE database (2020)

Scoreboard (2020)



Trend score: Calculated based on industry ODEX



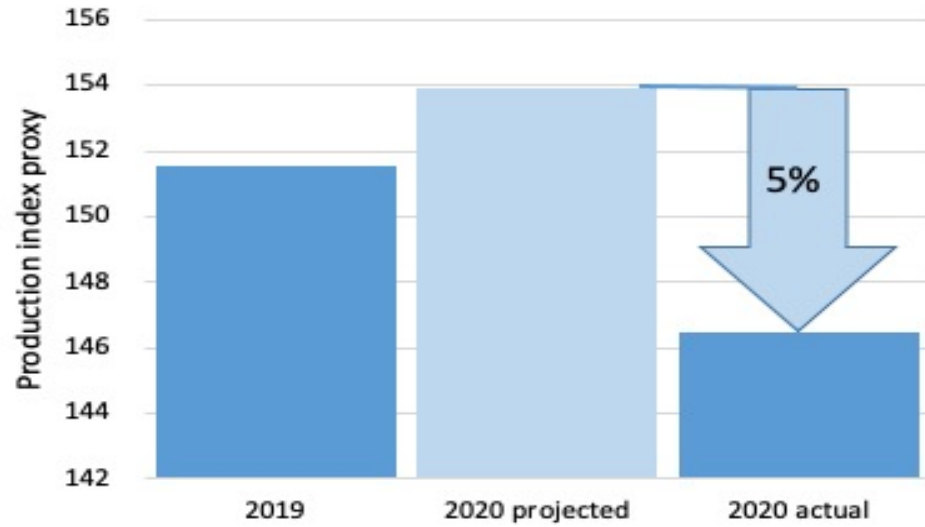
Level score: Calculated based on energy intensity (MJ/Eur)

Switzerland's combined rank on industry scoreboard : 4th

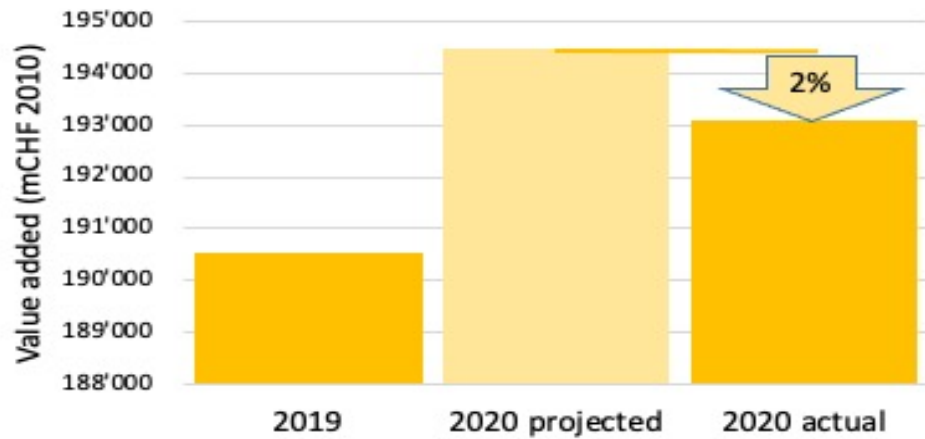
Sources: ODYSSEE-MURE scoreboard tool (2020)

Covid effect

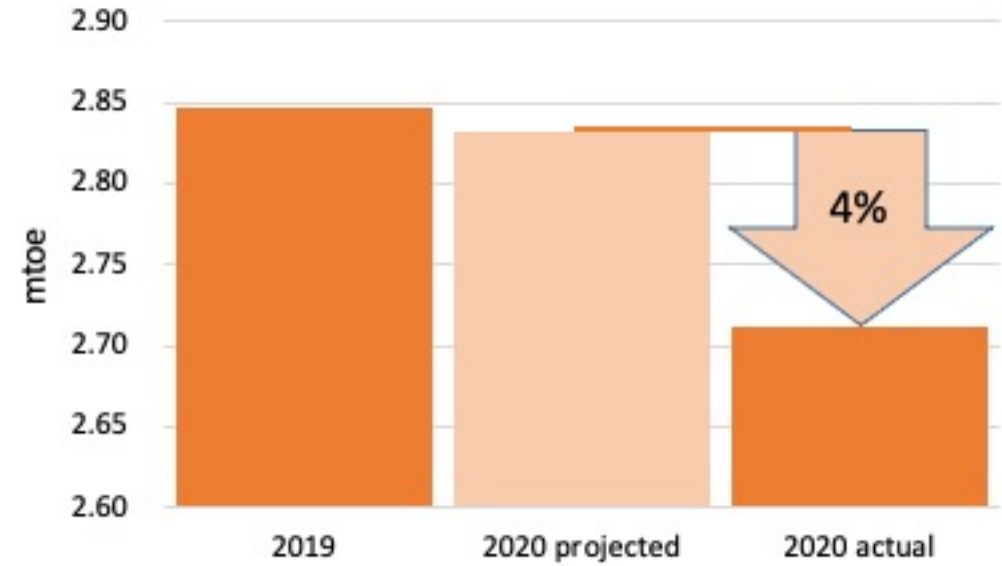
Physical activity



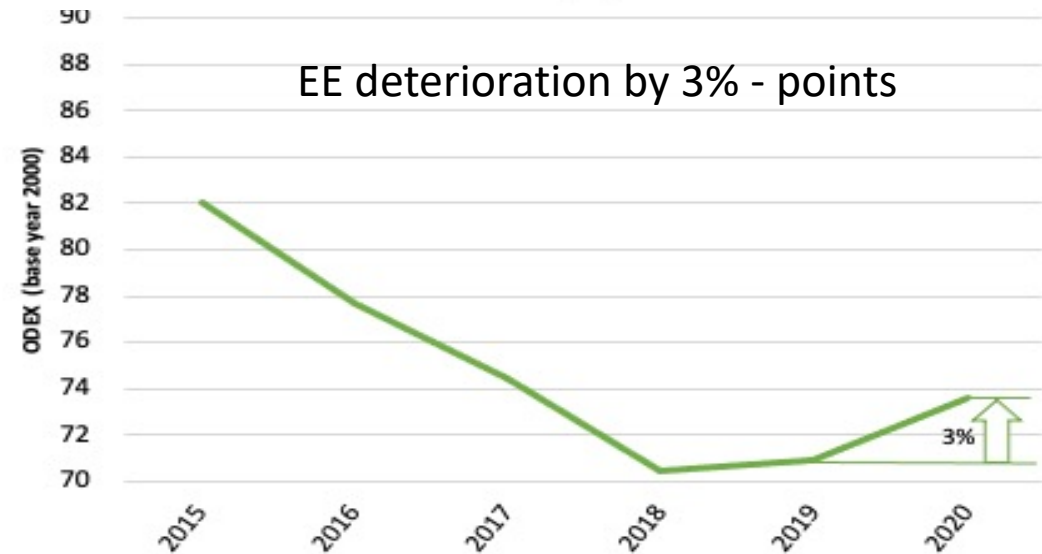
Economic activity



Energy consumption



EE deterioration by 3% - points



Sources: FSO (2020), SFOE (2020)

Conclusions

Physical activity (1.5% p.a.; from 2000 to 2020):

- One of the fastest growing industries in Europe (10th).
- Fastest growing sub-sector in Swiss industry: Chemicals manufacturing (4.6% p.a.)

Economic activity (2.1% p.a.; from 2000 to 2020):

- Some shift towards high value-added products, i.e. structural change contributing to some TFE reduction.

EE improvement (1.5.% p.a.; from 2000 to 2020):

- Moderate improvement as compared to European countries (10th).
- Together with structural shift contributes towards net TFE reduction.
- Most influential sub-sector: Chemicals manufacturing (3.2%).

Scoreboard (2020):

- Level: Ranks at the top as a result of high value-added products and KPI definition.
- Trend: Ranks mid-table although better than EU average.

Effect of Covid (2020):

- All indicators exhibit lower growth rates than in pre-Covid period.
- Industry ODEX deteriorates by 3%-points.

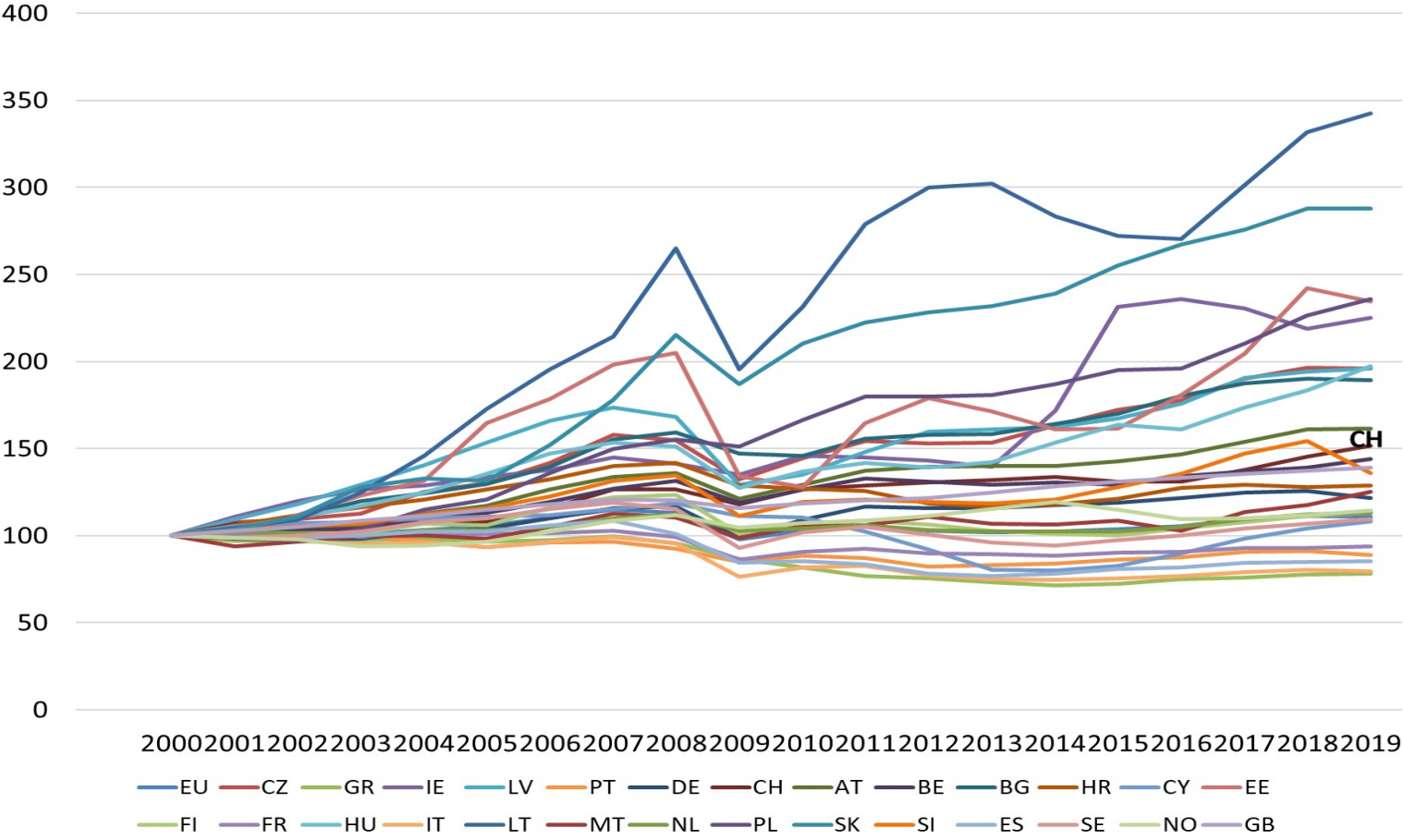
CO2 emissions (1% p.a.from 2000 to 2019):

- All sub-sectors except primary metals manufacturing experience decarbonisation of fuel mix

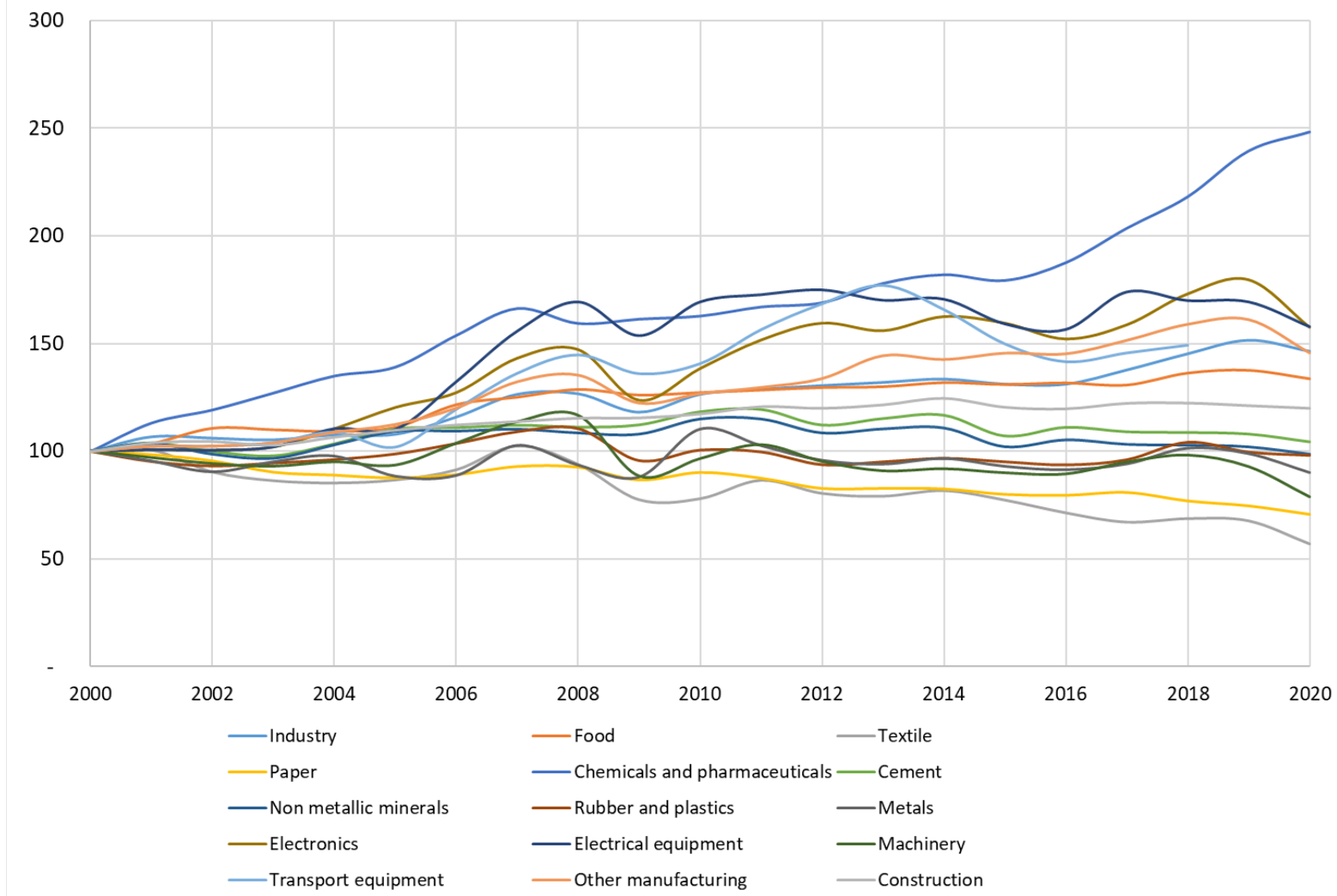
Thank you!

Additional slides

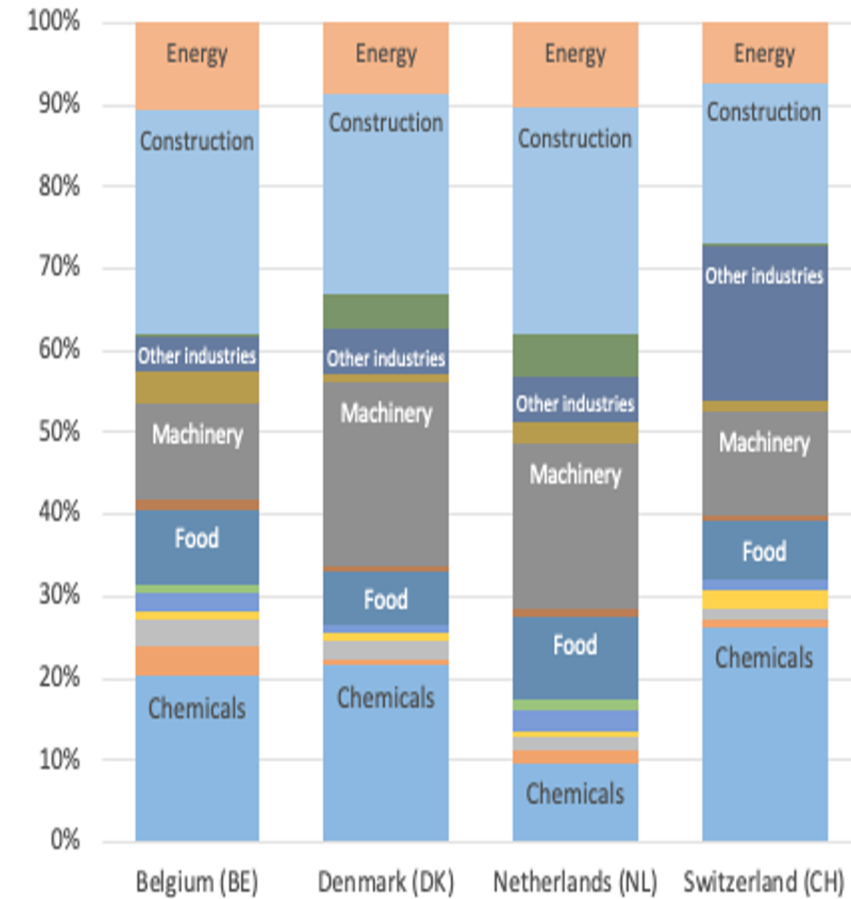
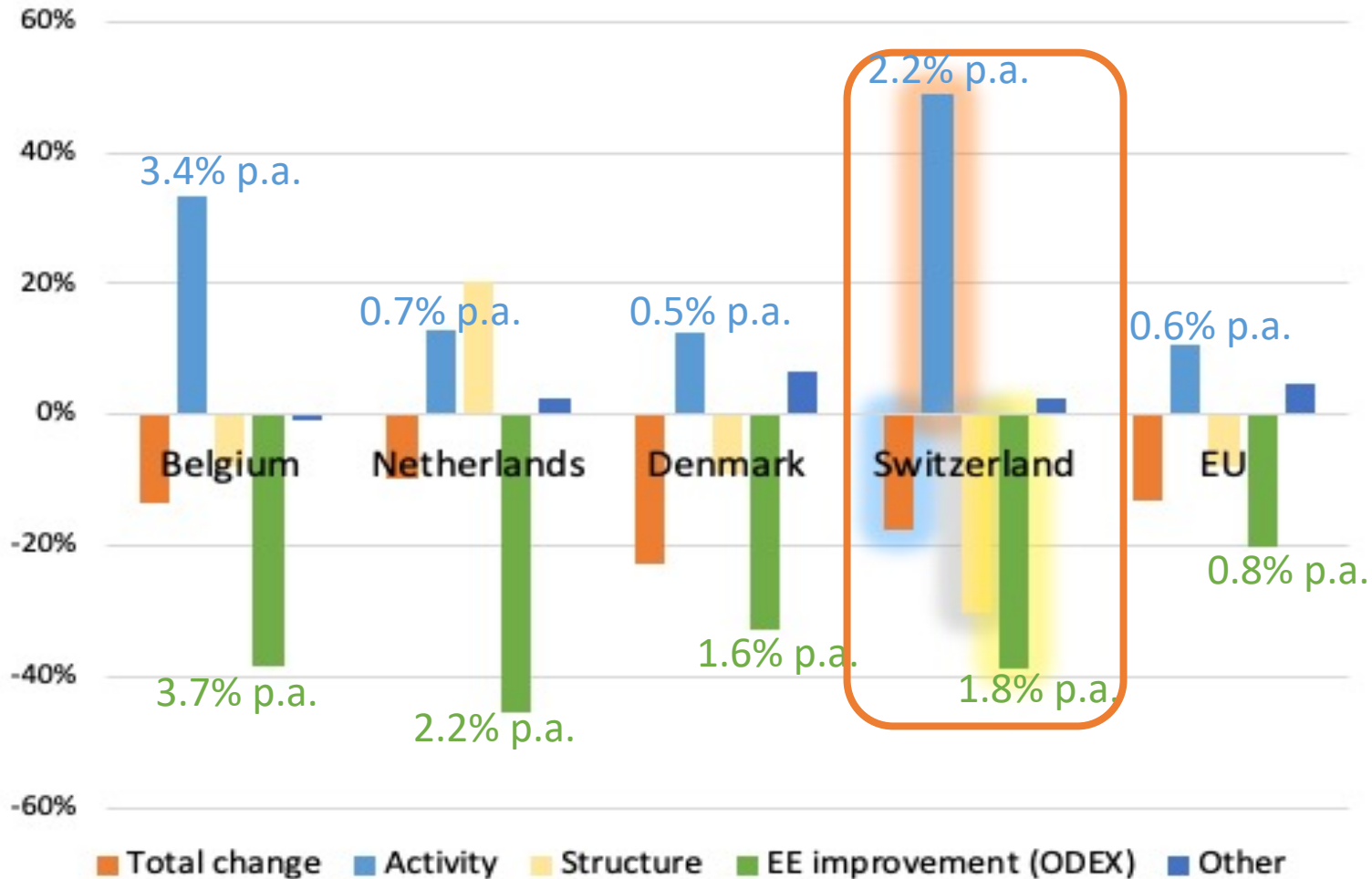
Development of industry production (all countries)



Development of production for Swiss industry



Country comparison (2000-2019)



Comparison with the countries of similar value added structure

Production index proxy (PIP)

- Turnover and producer price index statistics are available from federal statistical office.
- Producer price index tracks the changes in prices.
- Deflating the turnover by producer price index results in an indicator representing the change in the physical volume of production.

Period T0		Period T1	
Turnover	Price index	Turnover	Price index
CHF 110	100	CHF 120	107

Industrial production index is calculated as a ratio of turnover/price index for two periods

$$\frac{\frac{120}{107}}{\frac{110}{100}} = 1.018$$

Thus, in this example 101 will be the production index indicating the change in physical production between period T0 and T1.