



中国科学院科技战略咨询研究院

Institutes of Science and Development, Chinese Academy of Sciences



# Economic Impacts of CO<sub>2</sub> Emission Reduction Policy in China

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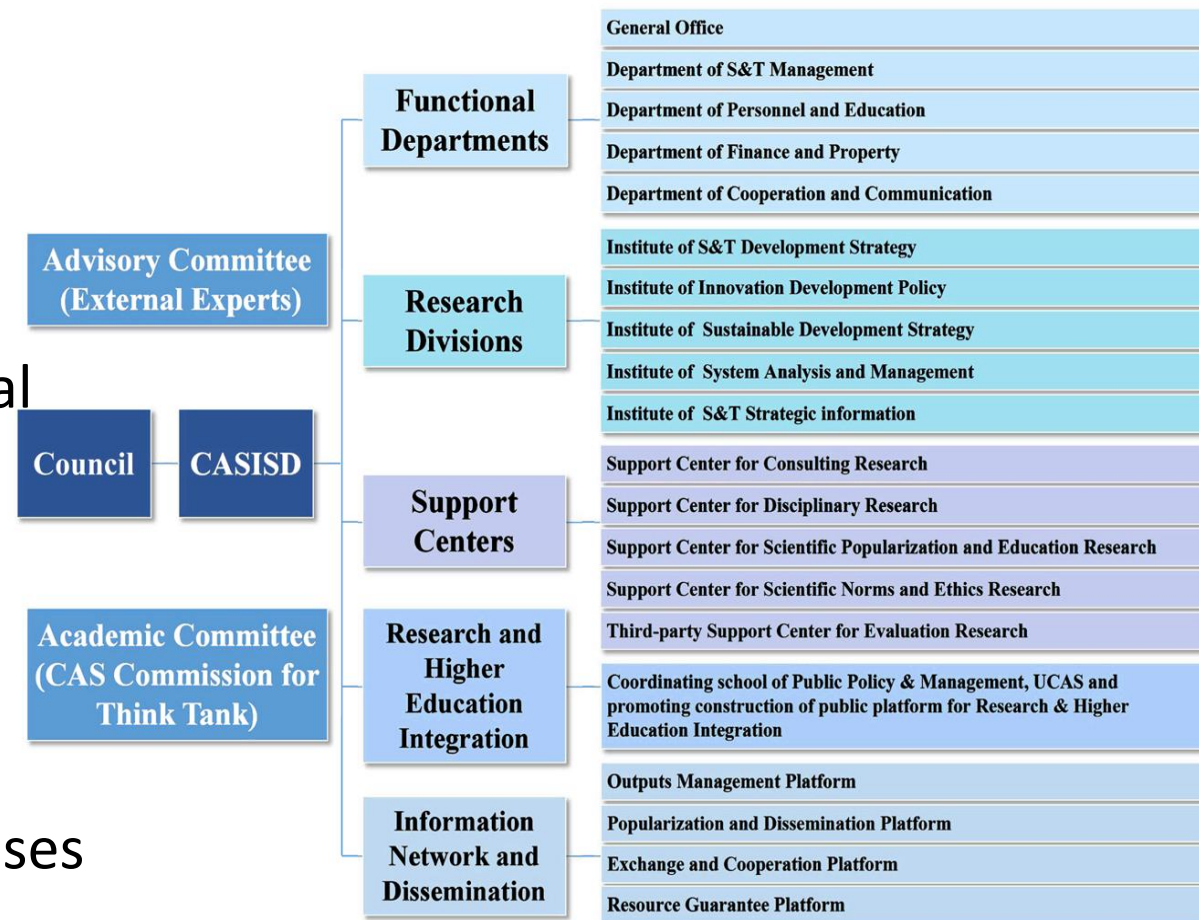
Institute of Science and Development, Chinese Academy of Sciences

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## Institute of Science and Development, Chinese Academy of Sciences

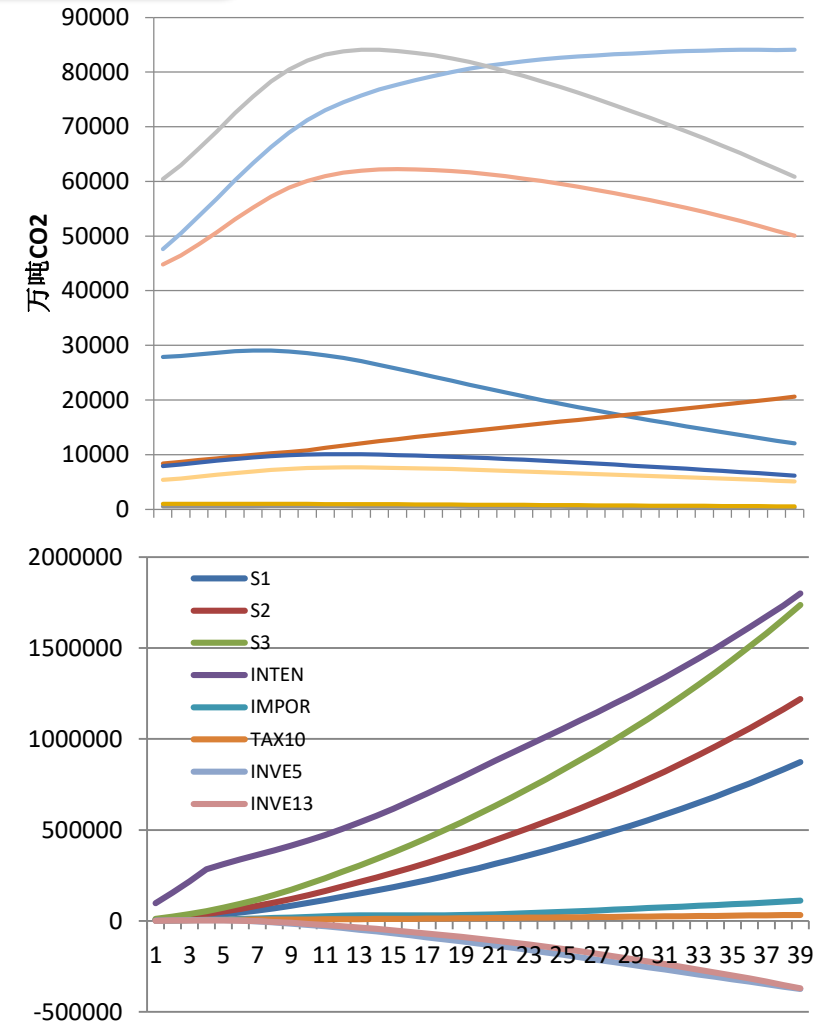
- One of the 25 national think tank
- The only cross-cutting institute in CAS
- Outputs and Products:
  - Decision suggests for central and provincial governments
  - Scientific research reports, peer reviewed articles, books
  - Decision supports for sectors and enterprises





## Cooperation between CASISD and REMI

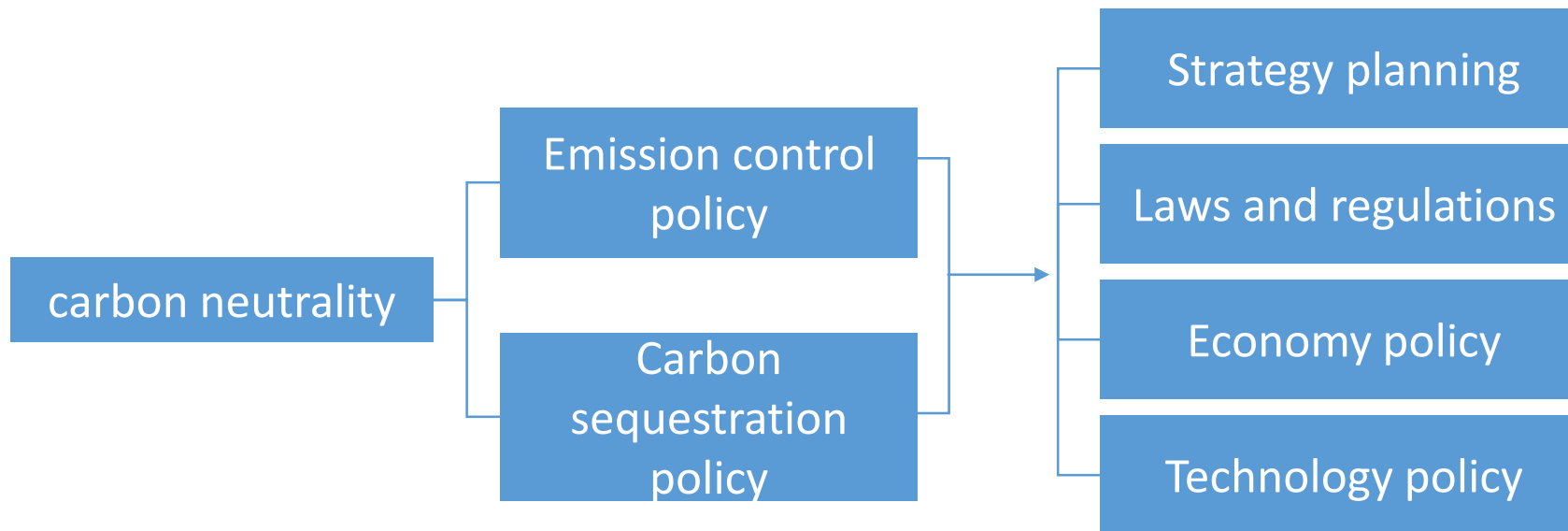
- Since year 2012
- China PI+ model: 5-regions model & 31-regions model
  - Funded by Global Environment Institute
- Projects:
- China's Emission Trading System assessment
  - Funded by National Development & Reform Committee
- Guangdong Province Emission Reduction Policy assessment
  - Funded by Energy Foundation
- Analysis on the CO2 Emission Peaking Policies
  - Funded by Chinese Academy of Sciences





## Background

Announcements of Xi Jinping: 2030 CO<sub>2</sub> emission peaking; 2060 carbon neutrality



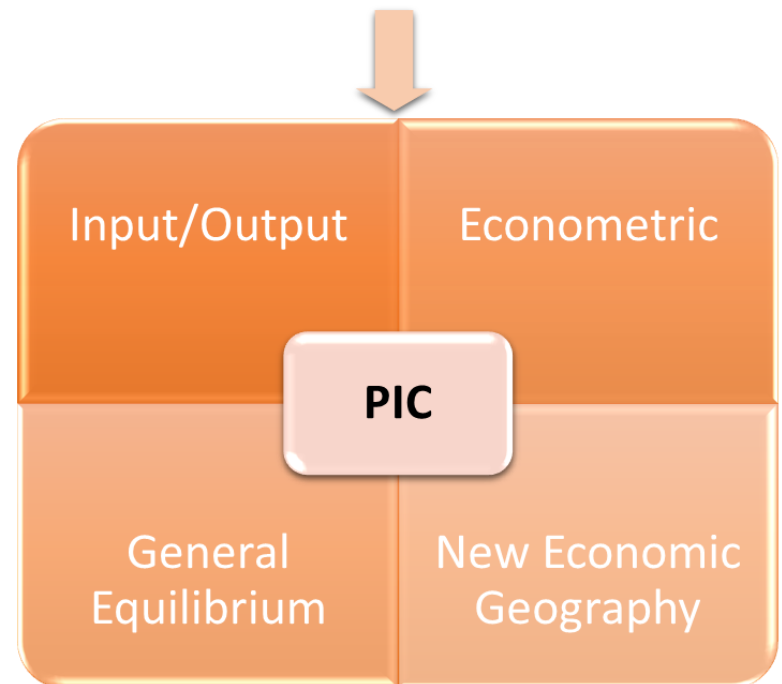




# Concerns on potential impacts

- Impacts on China's economy – ?
- Impacts on international economy – ?
- Impacts on US-China trade – ?

- Basic scenarios
- Sectors and Industries
- Cost-Benefit of policies





# Baseline trends setting

- Population
- Economic growth
- Urbanization
- Industry structure
- Energy intensity
- Energy structure

	2015	2020	2025	2030	2035	2040	2045	2050
population	1.377	1.410	1.449	1.457	1.453	1.445	1.436	1.420
Economic growth rate	7.5	7	6	5	4.5	4.0	3.7	3.5
Urbanization	56.4	60.0	63.0	66.0	68.3	70.5	72.8	75.0
Portfolio of Service Industry	44.46	44.50	47.35	50.20	53.20	56.20	58.70	61.20
Energy intensity Tons of standard coal per USD GDP)	0.10	0.09	0.09	0.08	0.07	0.07	0.06	0.06

	Unit	2020	2030	2040	2050
Total	10 <sup>8</sup> TCE	70.2	107.3	140.1	180.1
Coal	10 <sup>8</sup> TCE	49	72	90.6	112
	%	69.8	67.1	64.7	62.2
Oil	10 <sup>8</sup> TCE	10.5	16.5	22.6	28.6
	%	14.9	15.4	16.1	15.9
Natural gas	10 <sup>8</sup> TCE	2.2	3.6	4.6	5.9
	%	3.2	3.4	3.3	3.3
Non-fossil	10 <sup>8</sup> TCE	8.5	15.1	22.3	33.5
	%	12.1	14.1	15.9	18.6

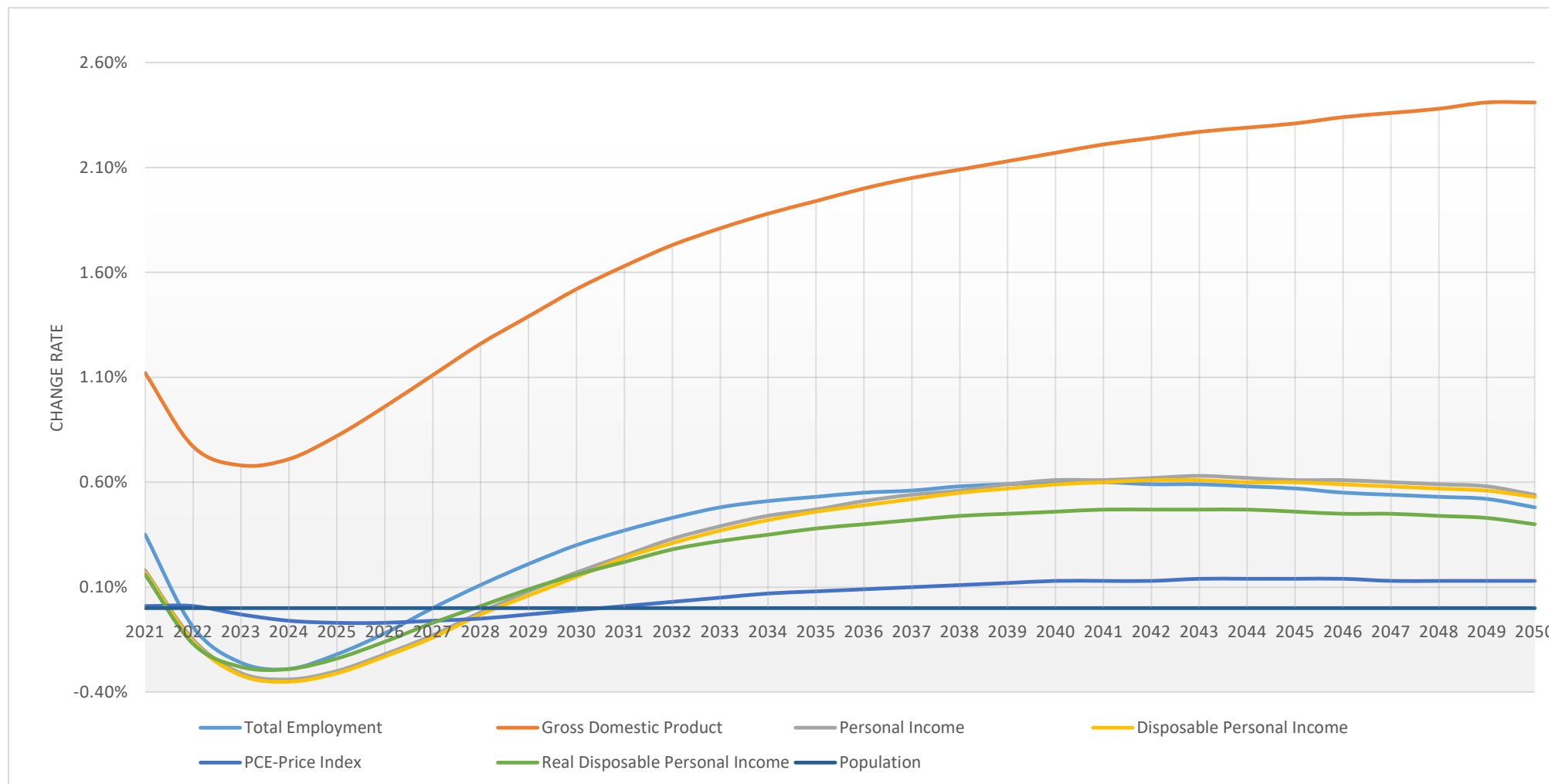


# Simulation on CO<sub>2</sub> emission reduced by 10%

- Increase the use of electricity and natural gas, decrease the use of other fossil fuels
- Increase the investment on renewable energy, decrease it on traditional energy
- Decrease energy use per GDP through investment on technology
- curb exports of energy-intensive products (reducing demand), increase imports of natural gas, and encourage exports of information services



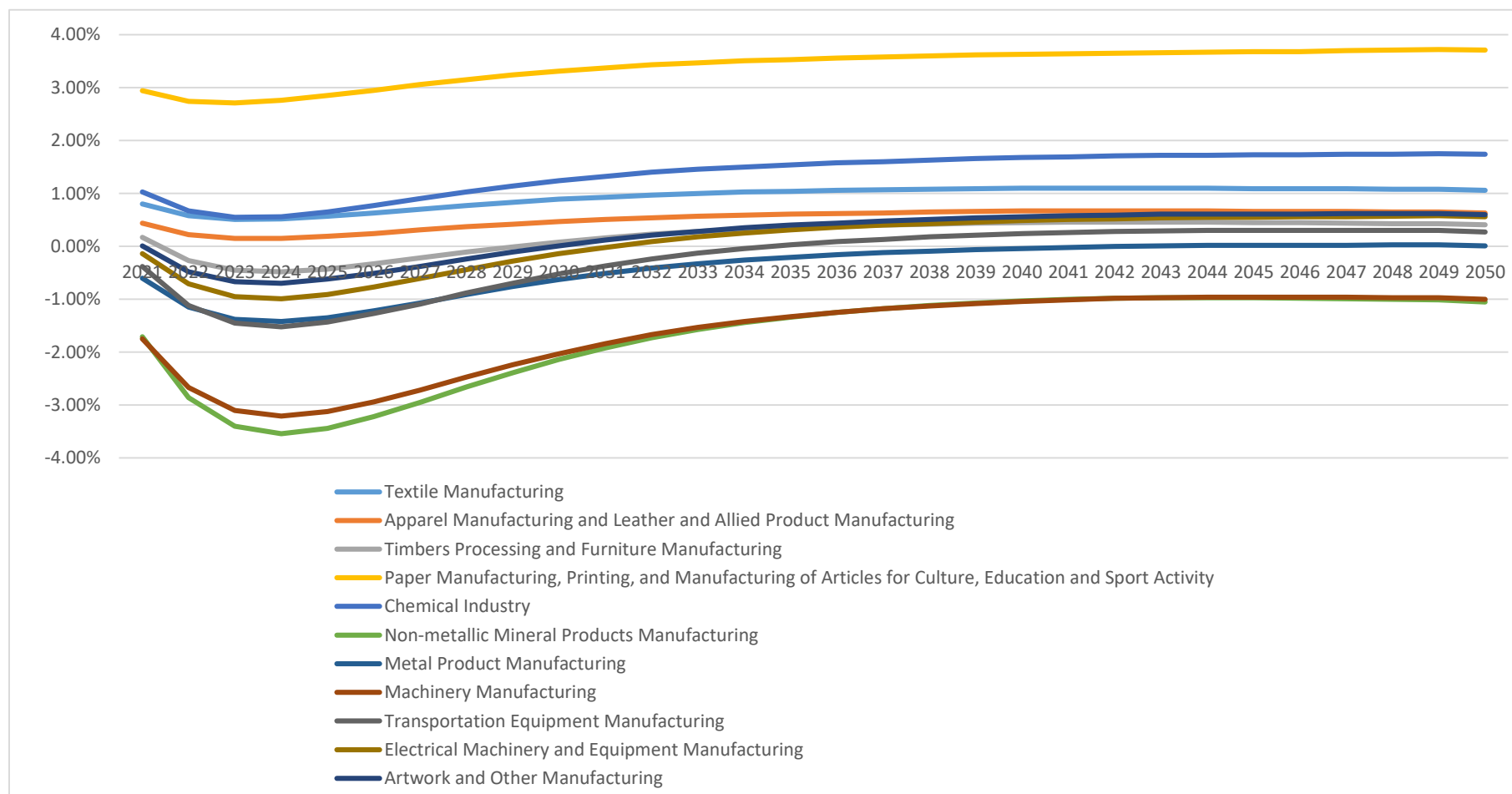
## Impacts on General Economy Index





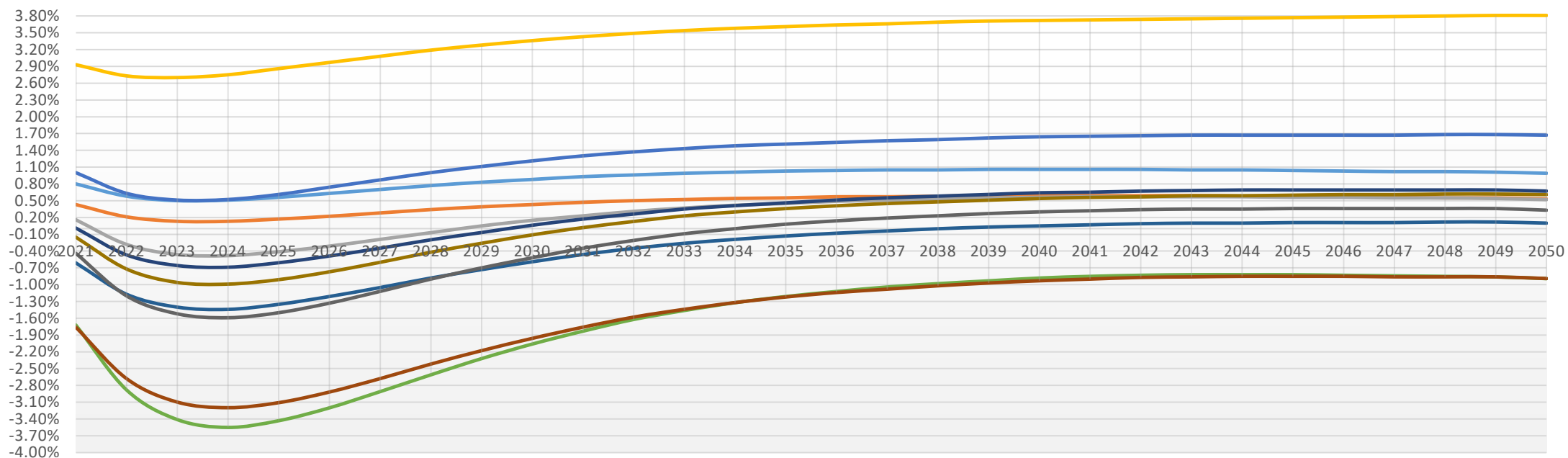


## Impacts on the Top 10 sectors with the largest volume of trade between China and the US (Changes on value added)





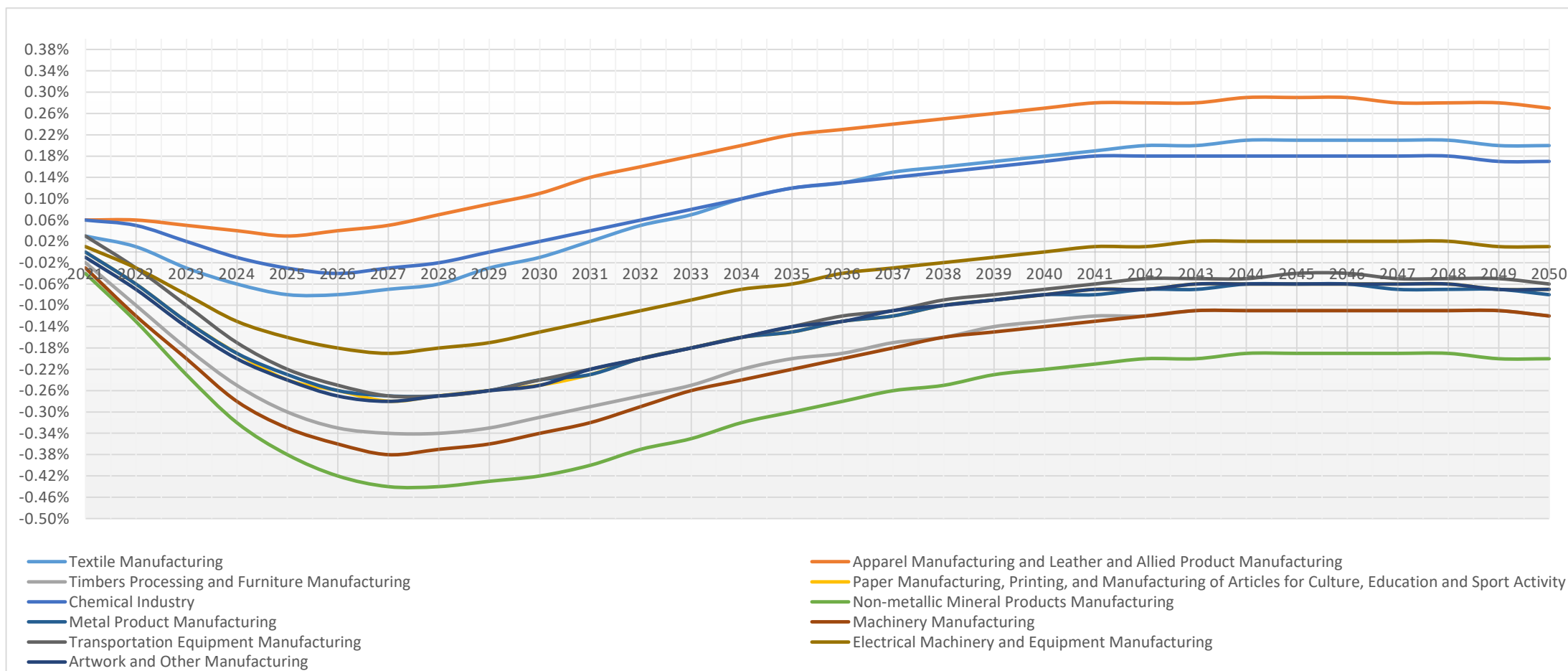
## Impacts on the Top 10 sectors with the largest volume of trade between China and the US(Changes on employment)



- Textile Manufacturing
- Timbers Processing and Furniture Manufacturing
- Chemical Industry
- Metal Product Manufacturing
- Transportation Equipment Manufacturing
- Artwork and Other Manufacturing
- Apparel Manufacturing and Leather and Allied Product Manufacturing
- Paper Manufacturing, Printing, and Manufacturing of Articles for Culture, Education and Sport Activity
- Non-metallic Mineral Products Manufacturing
- Machinery Manufacturing
- Electrical Machinery and Equipment Manufacturing



## Impacts on the Top 10 sectors with the largest volume of trade between China and the US(Changes on average annual wage rate)

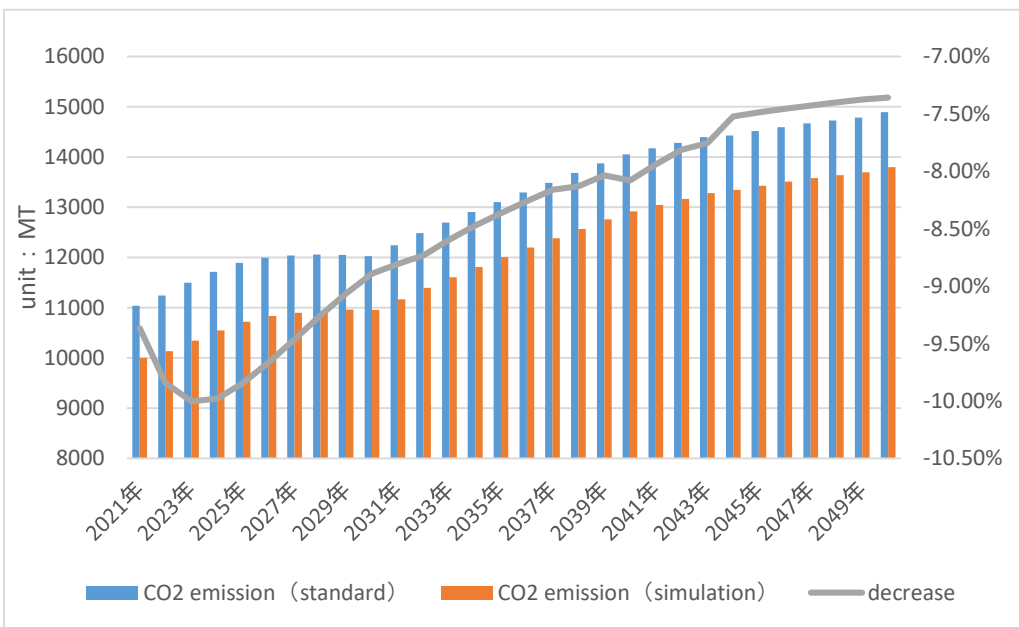




## CO2 emissions Changes

In Baseline scenario, the CO2 emissions will be 12027 MT in 2030, 14891 MT in 2050

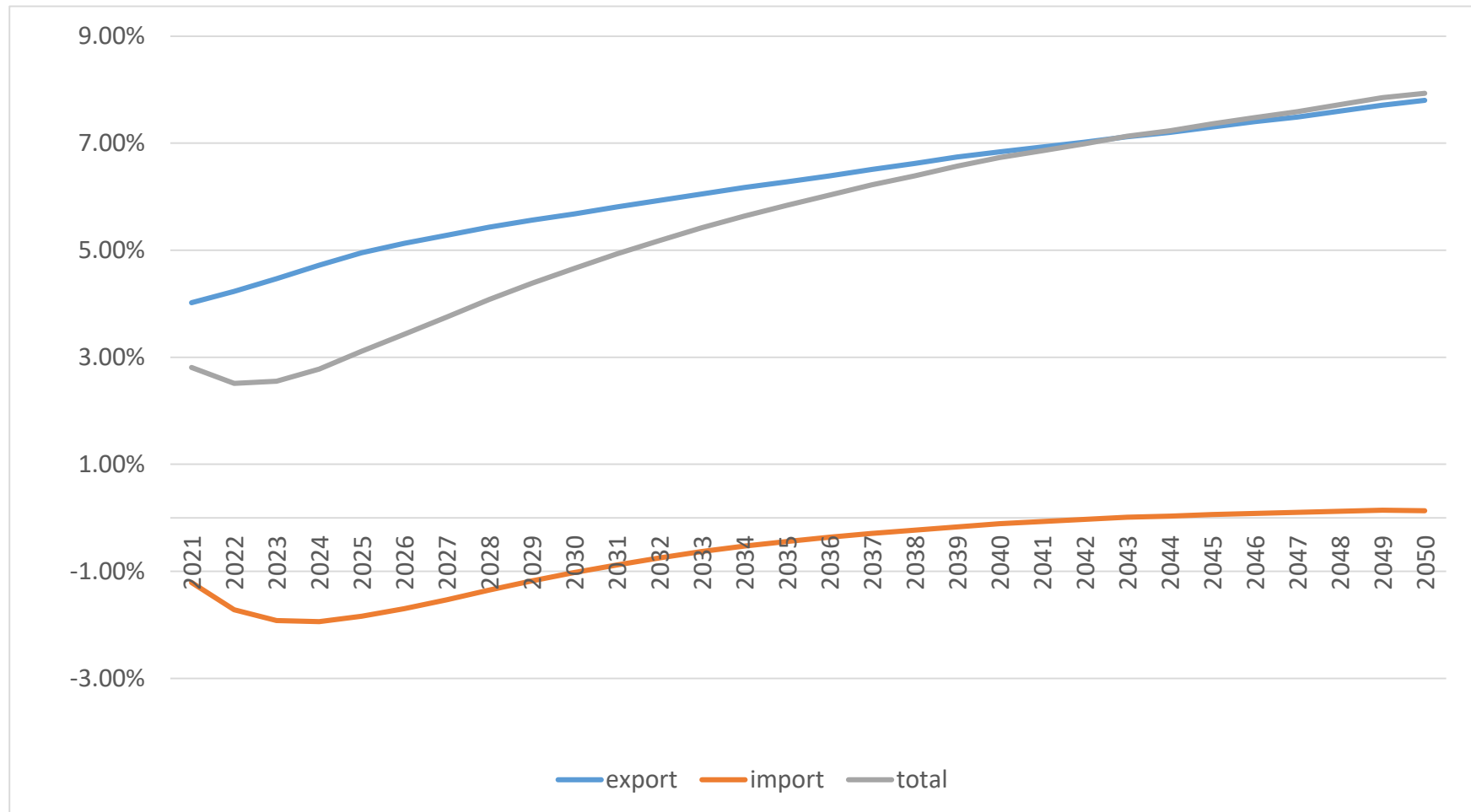
In emission reduced by 10% scenario, the CO2 emissions will be 10958 MT in 2030, 13795 MT in 2050



CO2 emission reduction in 10% scenario	2021	2025	2030	2035	2040	2045	2050
%	9.37%	9.84%	8.89%	8.36%	8.08%	7.49%	7.36%
MTC	1034	1171	1069	1096	1135	1087	1096



## Impacts on the exports and imports







# Thank You!

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