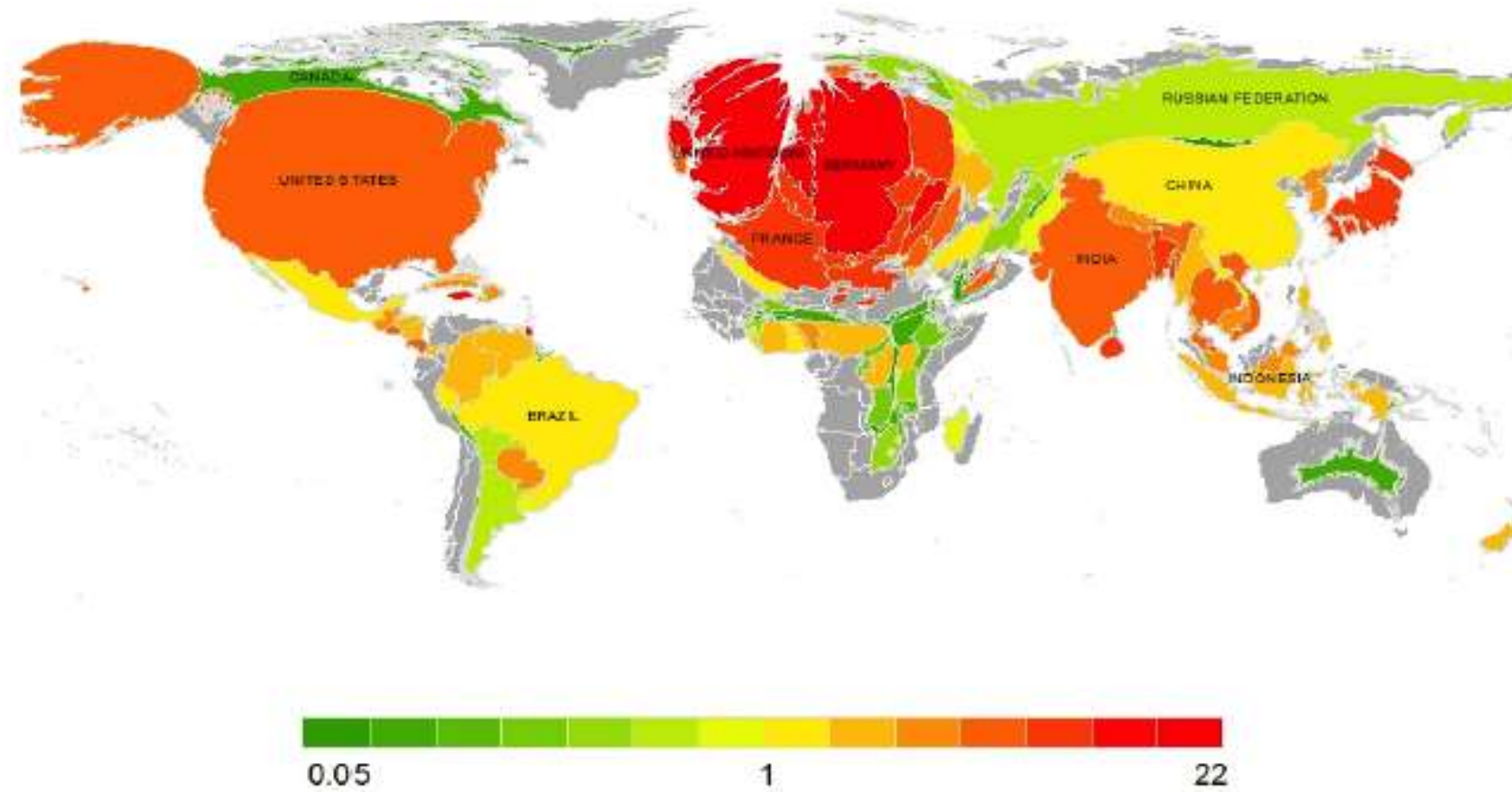


2nd BUR of Republic of Serbia

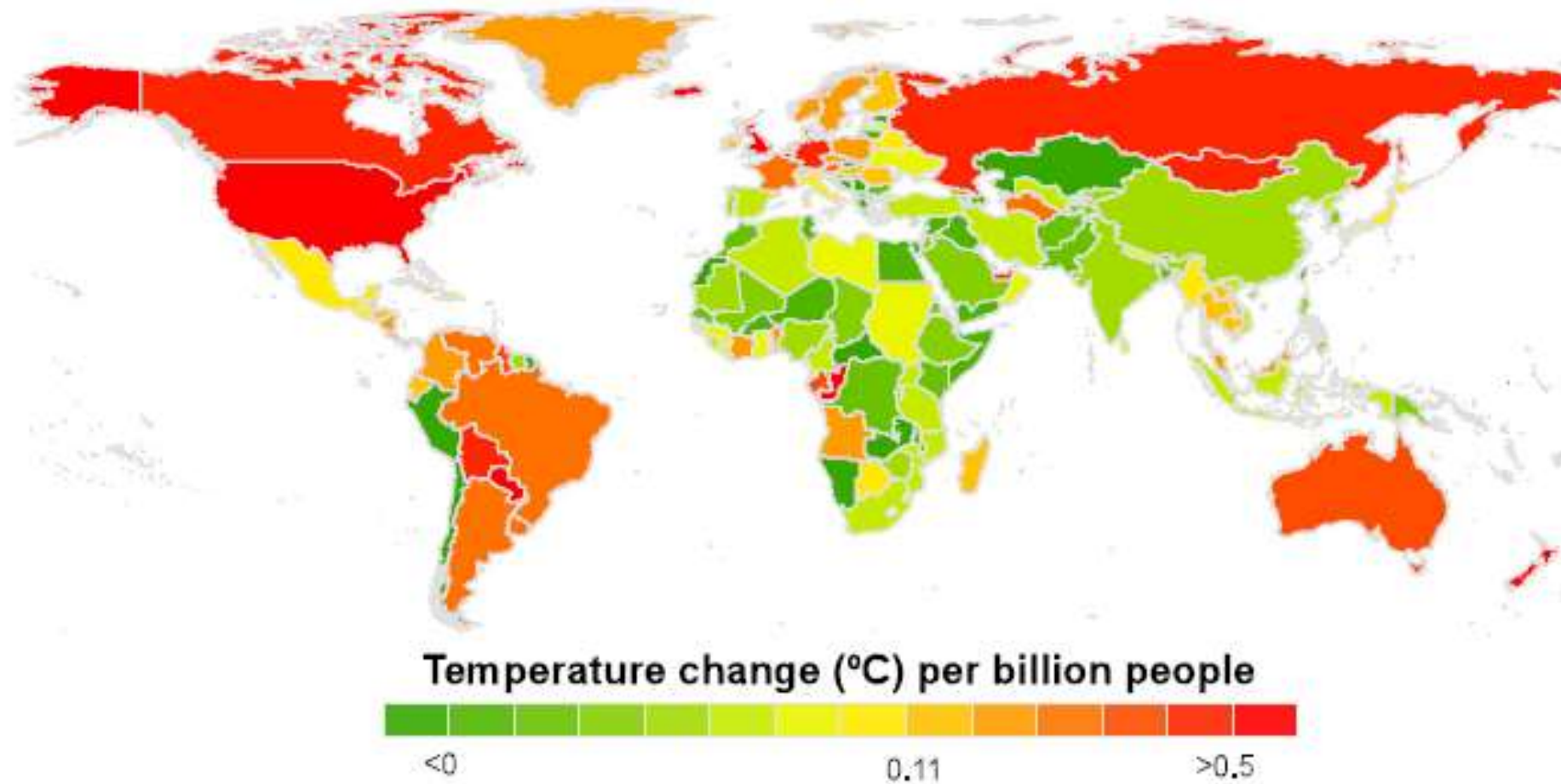
Vrdnik, 19-21.11.2019

Cartogram of national climate contributions (density equalized map)



The geographic area of each country has been scaled such that the coloured area is proportional to its climate contribution.

National per capita contributions to climate warming



Colours indicate values above or below the global average, where orange and red are higher, and yellow and green are lower than the current (year 2005) world average of 0,11 C per billion people

Obligations

- UNFCCC Party - has reporting obligations (BURs, NatComms)
- Paris Agreement Party – commitments for the GHG emission reduction and adaptation, as stated in the first NDC. - **9,8% until 2030 compared to emissions in 1990.**
- Second BUR and Third National Communication to the UNFCCC – preparation on-going.
- Purpose of these documents **is to report** on planned, in implementation and implemented national actions, policies and measures
- Based on the draft national Low-Carbon Development Strategy and its Action plan.

GHG monitoring

- Planning of measures and actions that lead to the GHG emission reduction but also the UNFCCC itself, require the GHG annual monitoring – GHG inventory.
- Serbian Environmental Protection Agency - responsible for the GHG inventory preparation and improvement.

- For preparation of national GHG inventory for the period 1990-2016, SEPA successfully concluded the transition the IPCC Inventory Software to MS Excel supported GHG inventory preparation which was developed with the support of the EU Twinning project „Establishment of the Mechanism for implementation of the Monitoring Mechanism” Regulation (MMR) “ in order to increase the understanding and transparency of the GHG inventory preparation and preparing the GHG inventory outputs to be in the format of CRF Reporter <http://www.ipcc-nggip.iges.or.jp/software/index.html>

- The GHG inventory for the Republic of Serbia was prepared according to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories for emission estimations of greenhouse gases which are result of anthropogenic activities: CO₂, CH₄, N₂O, HFCs, PFCs, SF₆ and NF₃.
- For reporting under the Paris agreement (2024) GWP from AR5 are a shall requirement, now we are using from AR 4

Forest land/forest and fuel wood issue

- Generally, methodology applied to estimate emissions is Tier 1 using default emission factor, in accordance with IPCC Guidelines
- Tier 2 for category 2F1b (emission of HFC), and 3B manure management (emission of CH₄)
- GHG emissions are expressed in CO₂ equivalent (CO₂e) considering the 2006 IPCC global warming potential (GWP) values (Assessment Report 4)

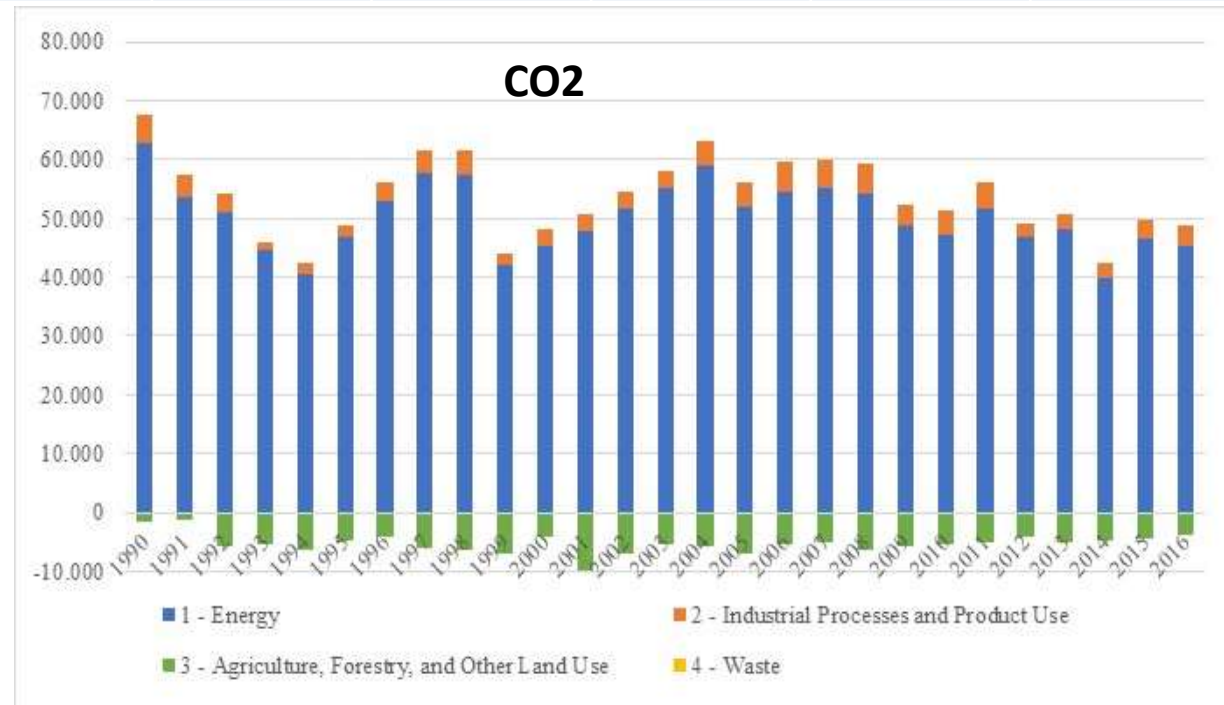
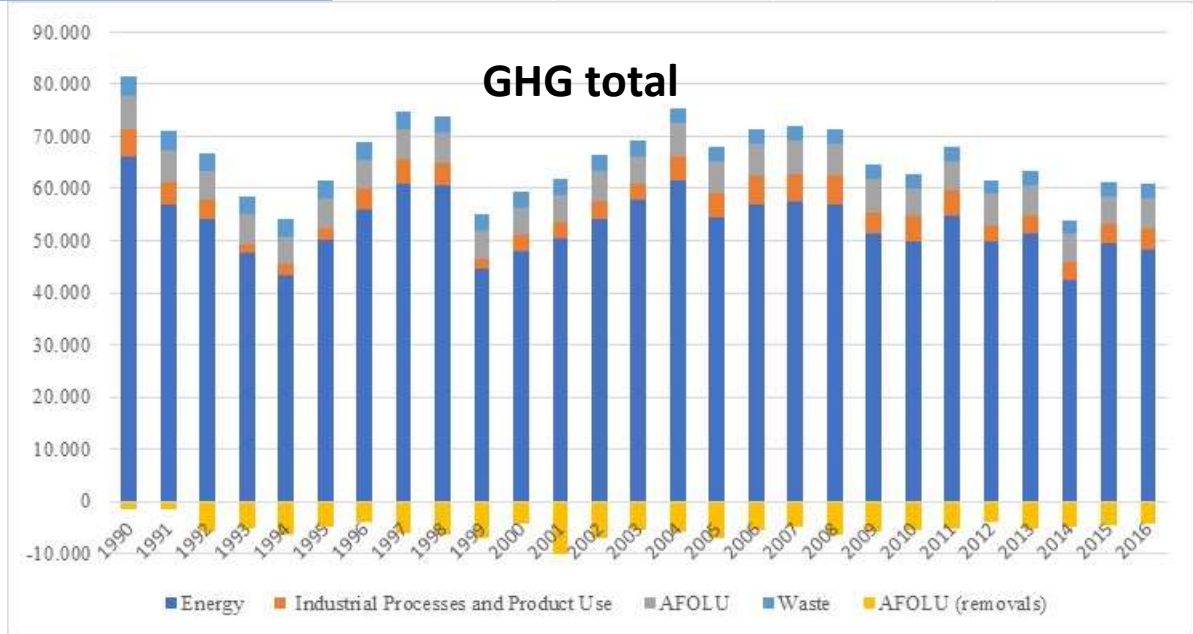
IPCC sector	Activity data	Source
Energy	National energy balance	Ministry of Mining and Energy
	Registered motor vehicles	Ministry of Interior (database)
	Fuel characteristic data	Ministry of Mining and Energy, NIS (oil company)
	Natural gas processed (scrubbed), CO ₂ content before scrubbing and CO ₂ emission	NIS (oil company)
Industrial processes and product use	Production and raw material/feedstock consumption for different industrial processes; use of products; population	Statistical Office of the Republic of Serbia (Statistical yearbook)
AFOLU	Number of different category of livestock	Statistical Office of the Republic of Serbia (Statistical yearbook)
	Consumption of mineral fertilizers	Statistical Office of the Republic of Serbia (Statistical yearbook)
	Land areas; annual increment, harvest	Corine Land Cover database
Waste	Amounts of municipal solid waste disposed to disposal sites	Statistical Office of the Republic of Serbia (Statistical yearbook)
	Waste composition	University of Novi Sad
	Waste-water handling	Statistical Office of the Republic of Serbia (Statistical yearbook)

Key Category Analysis for the latest reported year based on level of emissions (excluding LULUCF)

CRF	CRF Name	Fuel / Fuel group	Gas	Emissions 2015 [GgCO2e]	Lx(2015)	Cumulative	Ranking
1.A.1.a	Public Electricity and Heat Production	Solid fuels	CO2	31231,55	51,80%	51,80%	1
1.A.3.b	Road transport	Liquid fuels	CO2	5823,74	9,66%	61,46%	2
5.A.1	[5. Waste][5.A Solid Waste Disposal][5.A.1 Managed Waste Disposal Sites]	-	CH4	1944,01	3,22%	64,68%	3
1.A.1.a	Public Electricity and Heat Production	Gaseous fuels	CO2	1399,89	2,32%	67,00%	4
2.C.1.a	[2. Industrial Processes and Product Use][2.C Metal Industry][2.C.1 Iron and Steel Production][2.C.1.a Steel]	-	CO2	1394,30	2,31%	69,32%	5

Total GHG emissions with and without LULUCF

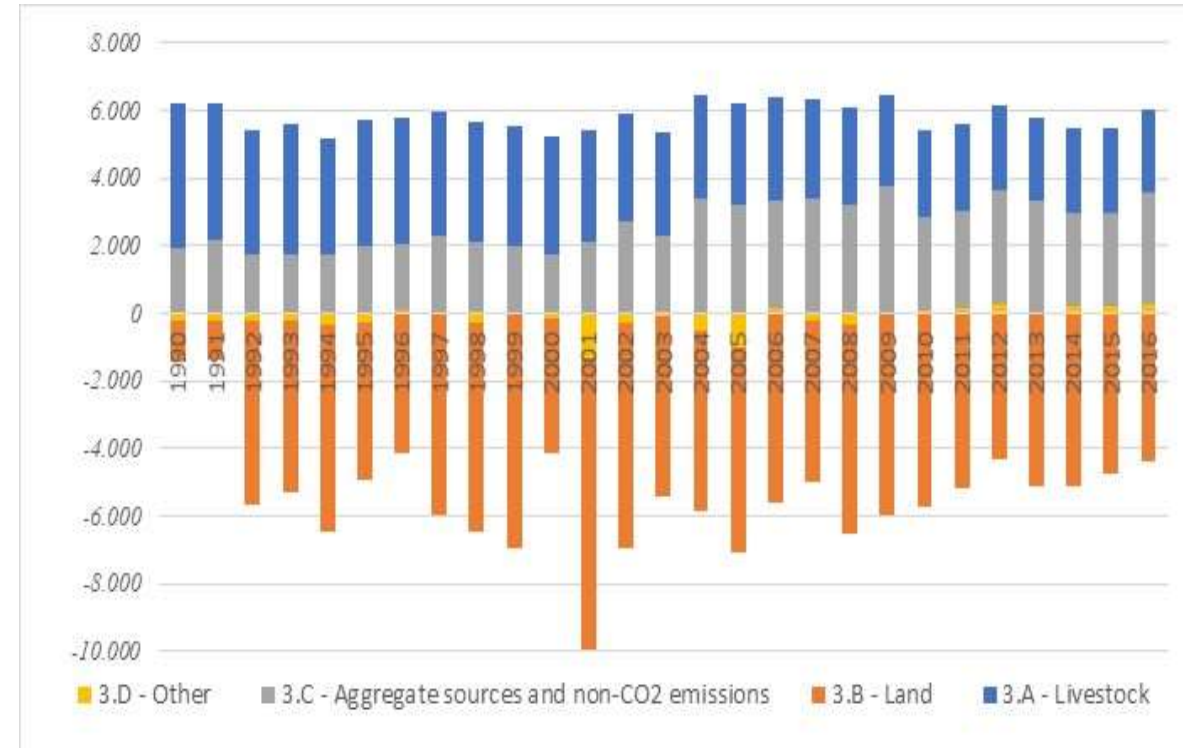
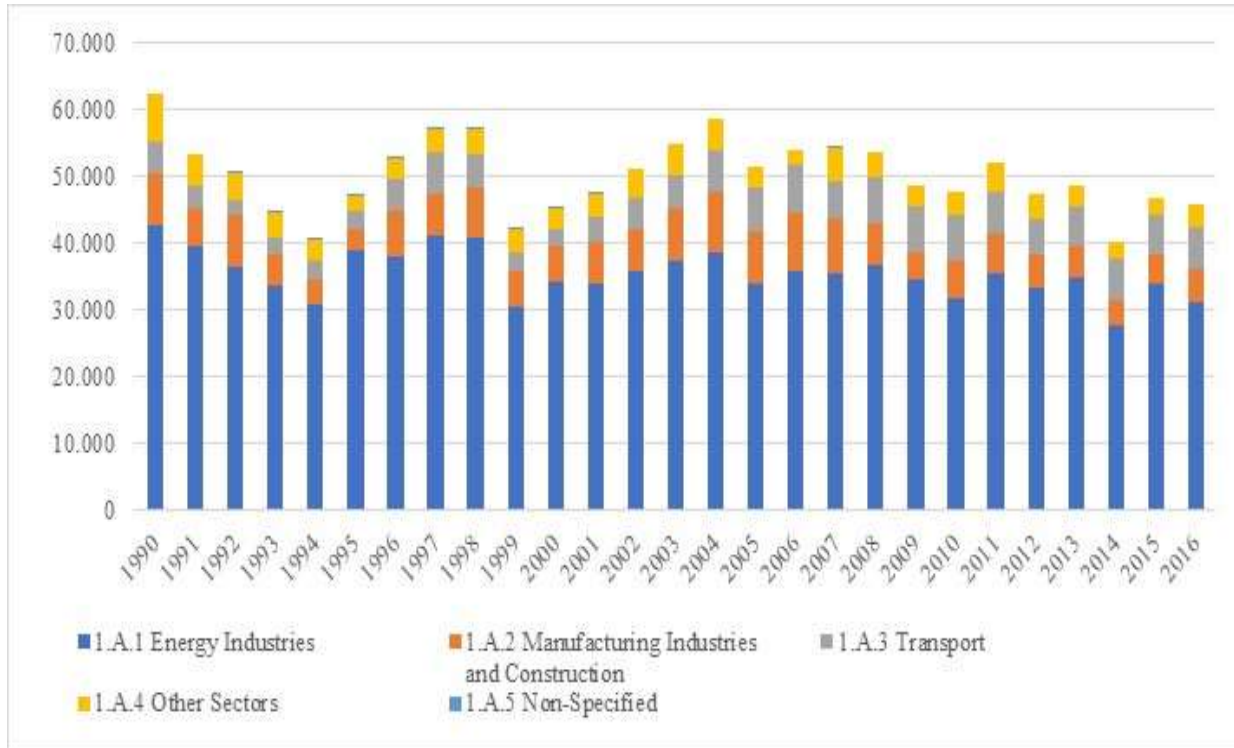
Source and sink category	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total GHG Emissions excluding Removals	81.525,86	59.278,77	68.092,72	62.650,47	67.951,97	61.636,52	63.287,24	53.946,53	61.233,19	60.917,27
Total GHG Emissions including Removals	80.093,91	55.172,55	61.002,38	57.023,28	62.900,56	57.583,21	58.225,94	49.027,76	56.700,26	56.808,74



GHG inventories

Source and sink category	2016/1990	2016/2000	2016/2005	2016/2010	2016/2015
Emissions					
Energy	-27,1%	0,3%	-11,4%	-3,6%	13,3%
Agriculture, Forestry, and Other Land Use	-6,8%	10,4%	-7,6%	8,6%	9,1%
Waste	-29,8%	-10,7%	-3,0%	-0,5%	-0,1%
Removals					
Agriculture, Forestry, and Other Land Use	186,9%	0,1%	-42,1%	-27,0%	-16,5%
Total GHG Emissions excluding Removals	-25,3%	2,8%	-10,5%	-2,8%	12,9%
Total GHG Emissions including Removals	-29,1%	3,0%	-6,9%	-0,4%	15,9%

Energy and AFOLU



GHG emissions in 2016 and trends

- In 2016, total GHG emissions excluding removals in the Republic of Serbia amounted to 60917,27 Gg CO₂ eq.
- Since the year 2010, total GHG emissions excluding removals have decreased by 2.8%.
- The largest share in the year 2016, 79.1% of the total GHG emissions, originates from the energy sector, followed by the AFOLU sector (excluding removals), which in the year 2016, due to the relatively intense agricultural production (biochemical processes in stockbreeding and farming), emitted 9.5% of the total GHG emissions
- IPPU: in 2015, 8,2% lower than in 2010.
- Agriculture emissions accounted for 8,6% of total emissions in 2016 and were 0,9% below 2010.
- Waste emissions represented 4,4% of national total emissions and lower app. 0,5% then in 2010.
- In the year 2016, the main greenhouse gas (GHG) was carbon dioxide (CO₂), accounting for 80.7% of total GHG emissions expressed in CO₂ equivalent (CO₂ eq), followed by methane (CH₄) (12.2%) and nitrous oxide (N₂O) (6.3%).

QA/QC

- Priority capacity-building areas for development and further improvement of GHG inventory in the Republic of Serbia, as part of the MRV framework, which were identified are:
 - Enhancement of the institutional capacities and cooperation in order to:
 - implement obligations as contained in the draft Law on Climate Change
 - implement QA/QC activities and
 - implement the GHG inventory improvement plan
 - Development of reliable and timeliness activity data collection system
 - Develop supporting tools to prepare GHG inventory using higher Tier methodologies
 - Further development and improvement of country-specific emission factors and other parameters, including supporting methodologies

Mitigation measures

- The PRIMES – GEM-E3 suite: PRIMES energy system model and GEM-E3 for macroeconomic modelling, with the following PRIMES sub-models:
 - PRIMES Residential and Tertiary sector module,
 - PRIMES Industrial sector module,
 - PRIMES-TREMOVE Transport model,
 - PRIMES-Gas Supply model,
 - PRIMES-Biomass model,
 - PRIMES power sector-district heating-CHP models,
 - PRIMES-Refinery,
 - PRIMES-primary production, the ETS market simulator, and the balancing and market clearing model integration routine;
- CAPRI (Common Agricultural Policy Regional Impacts) model for agriculture and land use, land use change and forestry (LULUCF);
- The IPCC 2006 Waste model for the waste sector (excluding waste water, which was estimated using a distinct, simplified approach).

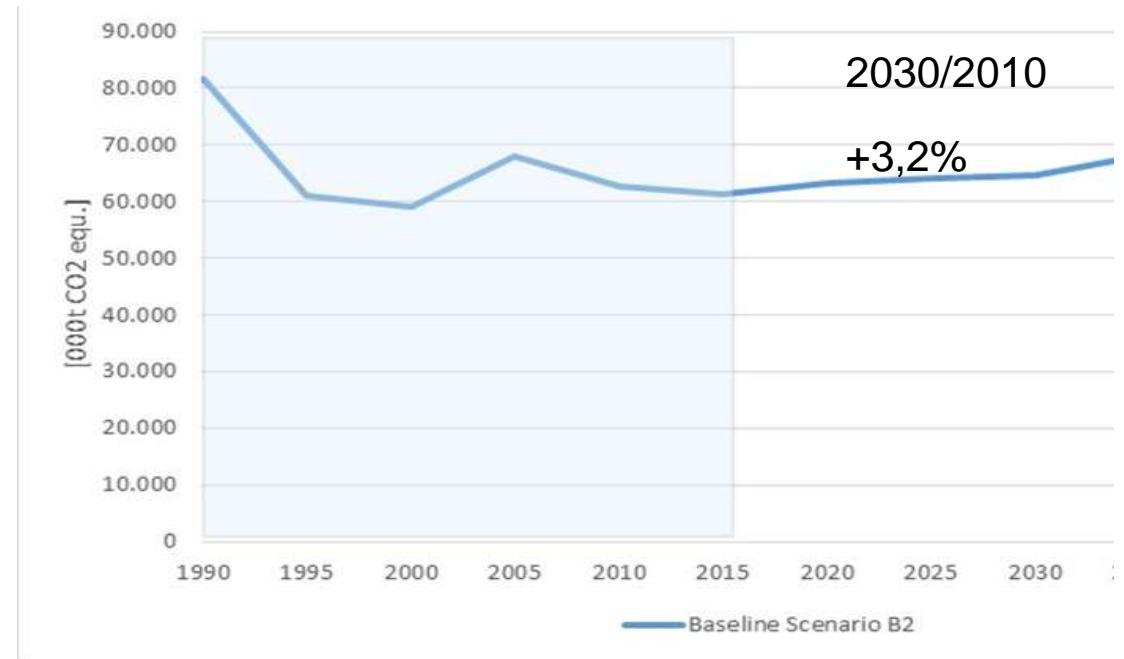
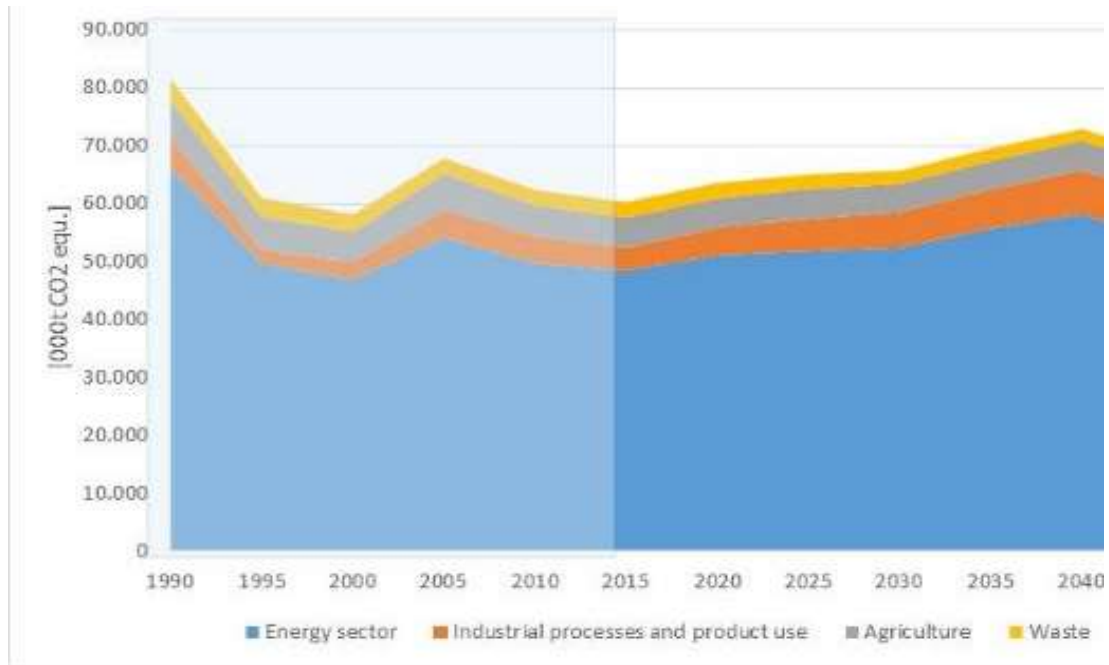
Scenarios up to 2030

Scenario	By definition:	National assumption	PAMs included
Baseline (BaU)	Excludes all PAMs implemented, adopted and planned after the year chosen as the starting point for the projection	Includes all PAMs adopted by 2015	No other PAMs than those adopted by 2015, including full implementation of Energy Efficiency Action Plan (EEAP) and National Renewable Energy Action Plan (NREAP) as commitment under the Energy Community Treaty
With measures (WM)	Encompasses currently implemented and adopted policies and measures (PAM)	Currently implemented and adopted as well as certain PAMs planned for implementation up to 2030	<p>Implementation of all EU acquis achieving up to 2030 compared to 1990:</p> <p>33% GHG emissions reduction</p> <p>28,9% RES</p> <p>24,5% enhanced energy efficiency</p>
With additional measures (WAM)	Encompasses implemented, adopted and planned policies and measures	Implemented, adopted and policies and measures which implementation requires significant financial and technological support	<p>1) Achievement of the EU 2030 targets:</p> <p>40% GHG emissions reduction compared to 1990;</p> <p>32% RES by 2030 32,5% enhanced energy efficiency</p> <p>2) Achievement of the EU 2050 targets: 80% GHG cuts in 2050 compared to 1990 levels</p>

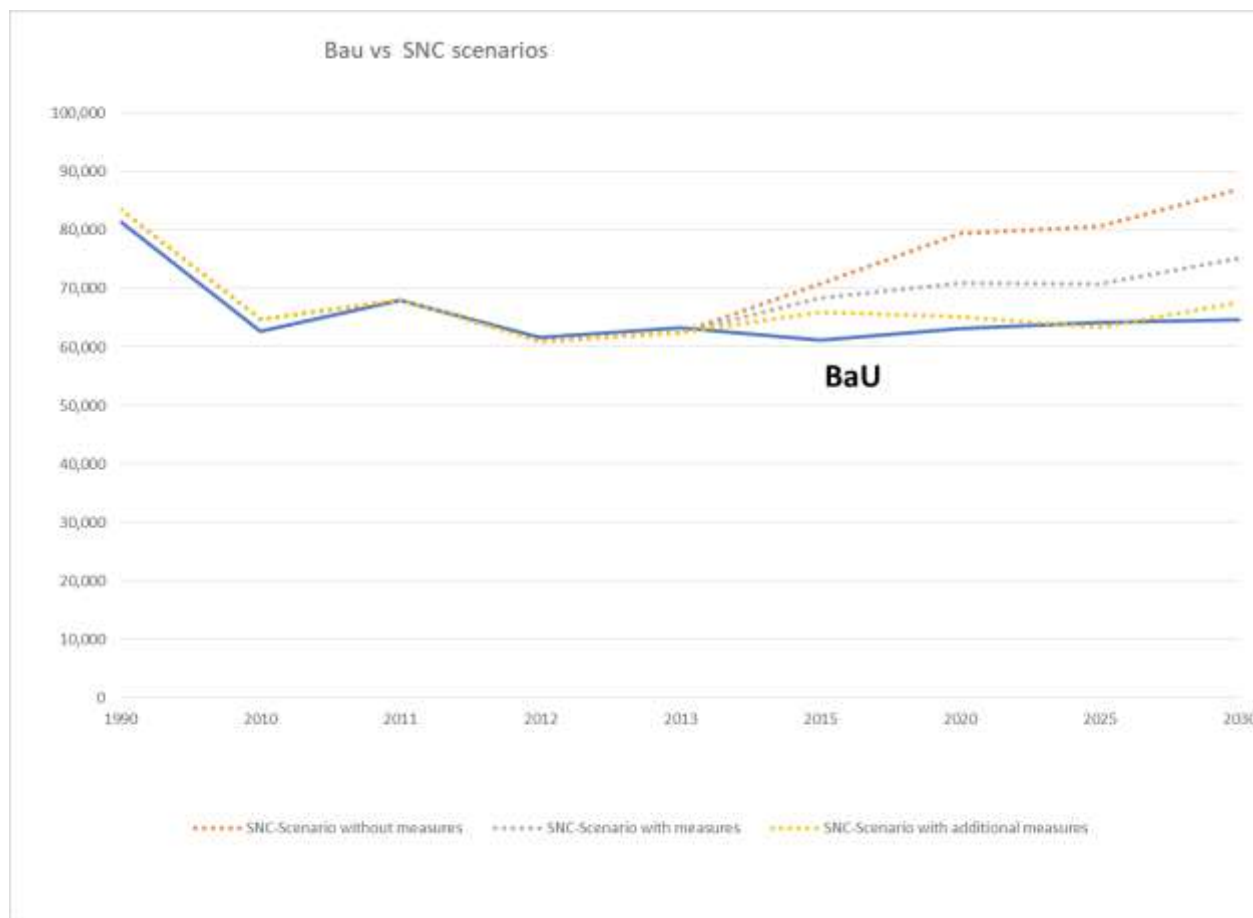
BAU scenario

Year/ Sectors	1990	2005	2010	2015	2020	2025	2030	2030/ 2010	2030/ 1990
Energy industries	44.146	35.557	33.050	34.700	34.451	34.188	34.590	4,7%	-21,6%
Manufacturing industries and construction	6.418	6.064	4.278	3.452	3.898	4.062	4.014	-6,2%	-37,5%
Transport	4.564	6.702	6.742	5.995	7.197	7.822	8.354	23,9%	83,0%
Other sectors	7.048	3.029	3.477	2.711	2.627	2.660	2.677	-23,0%	-62,0%
Fugitive emissions	3.841	2.973	2.409	2.523	2.406	2.474	2.221	-7,8%	-42,2%
IPPU	5.455	4.729	4.660	3.883	4.736	5.384	5.671	21,7%	4,0%
Agriculture	6.186	6.238	5.305	5.259	5.133	5.046	4.752	-10,4%	-23,2%
Waste	3.868	2.800	2.730	2.709	2.755	2.582	2.371	-13,1%	-38,7%
Total B2 (without LULUCF)	81.526	68.091	62.650	61.233	63.204	64.218	64.65	3,2%	-20,7%
LULUCF	-1.432	-5.627	-5.627	-4.533	-6.532	-5.451	-5.050	-10,3%	-10,3%
Totals with LULUCF	80.094	62.464	57.023	56.700	56.672	58.767	59.600	4,5%	4,5%

Shares of sectors and trend in 2030 BAU emissions

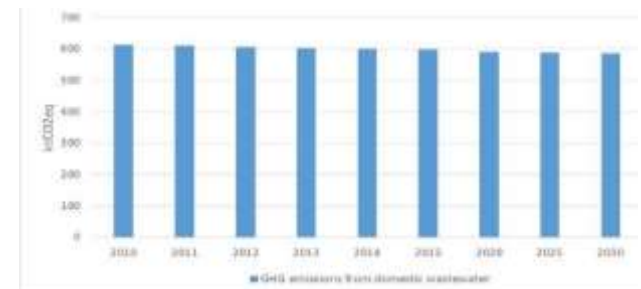
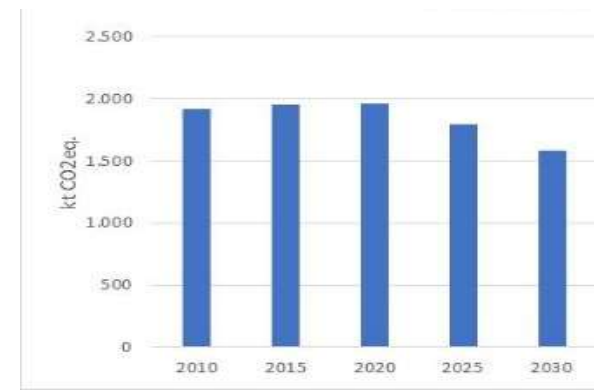
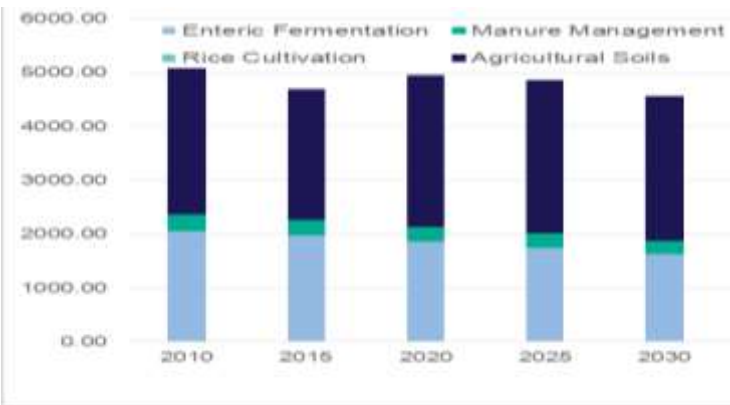
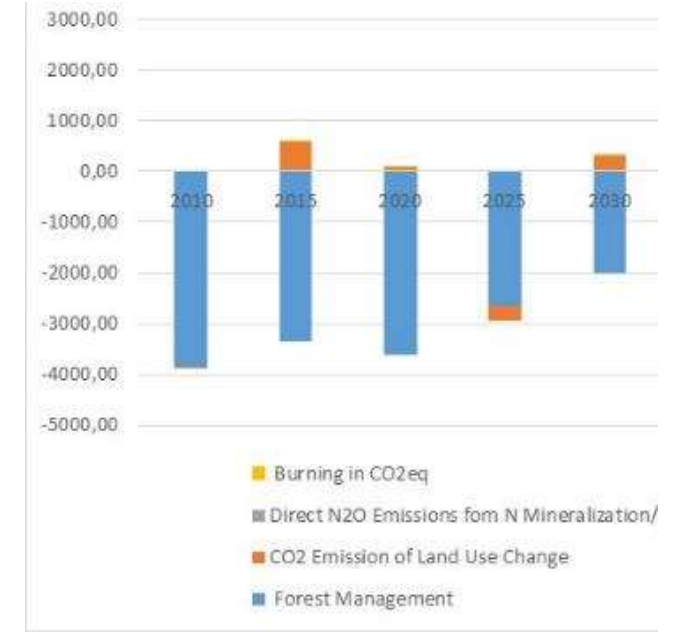
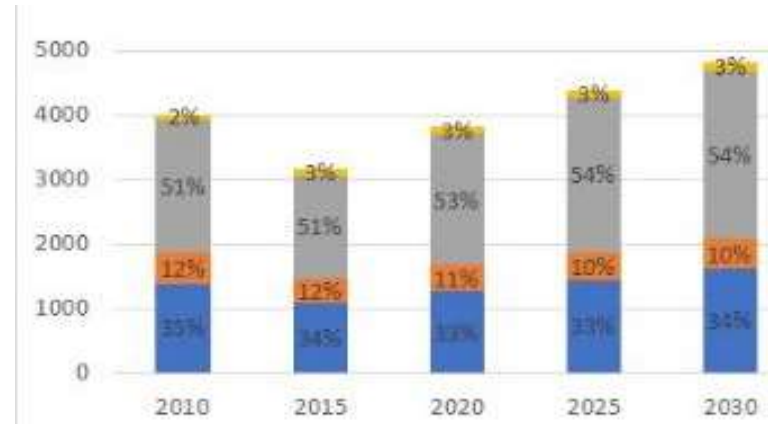
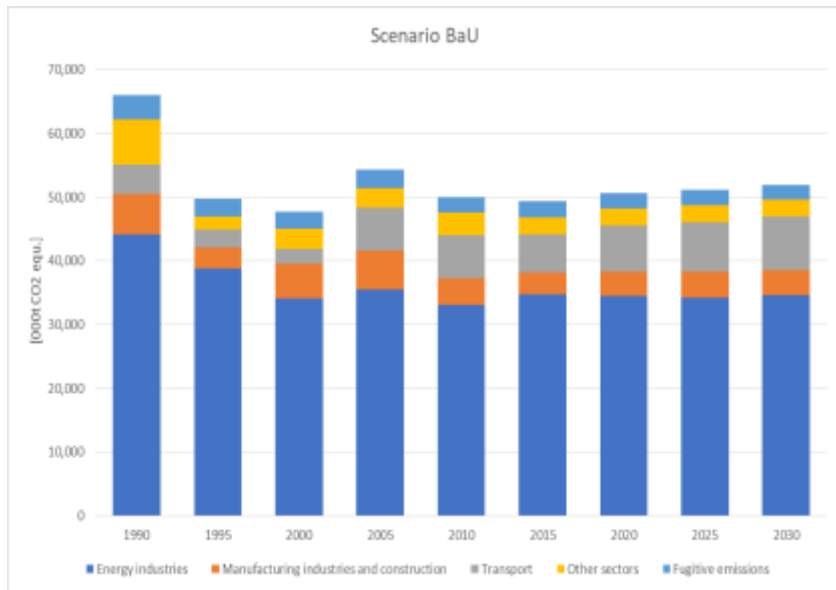


BaU/SNC

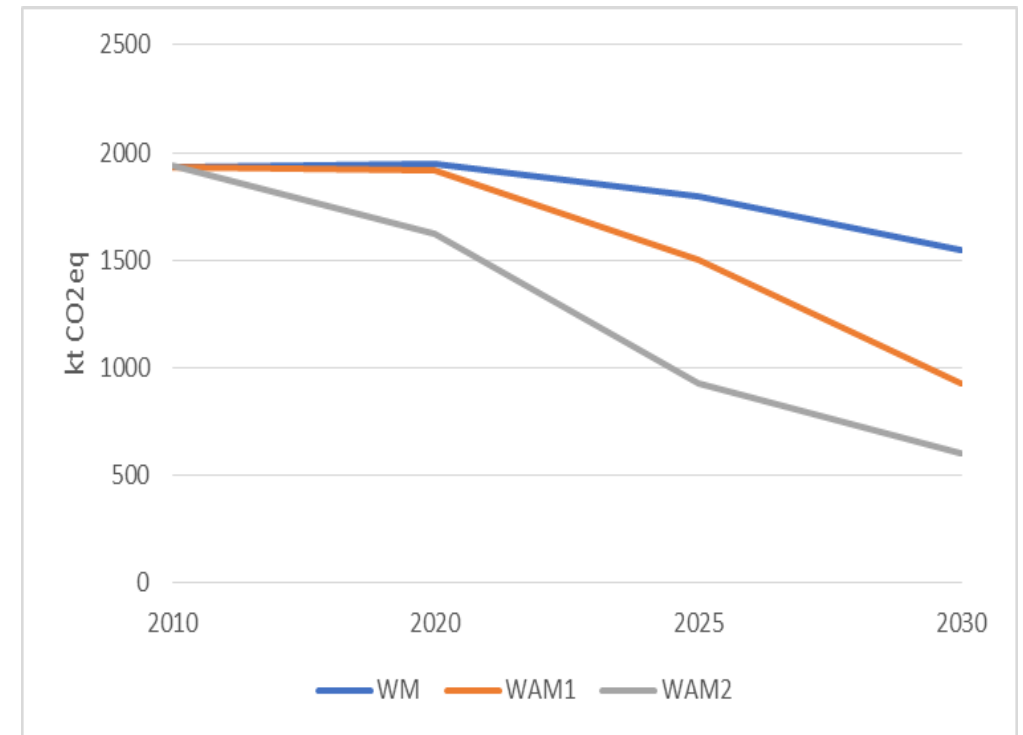
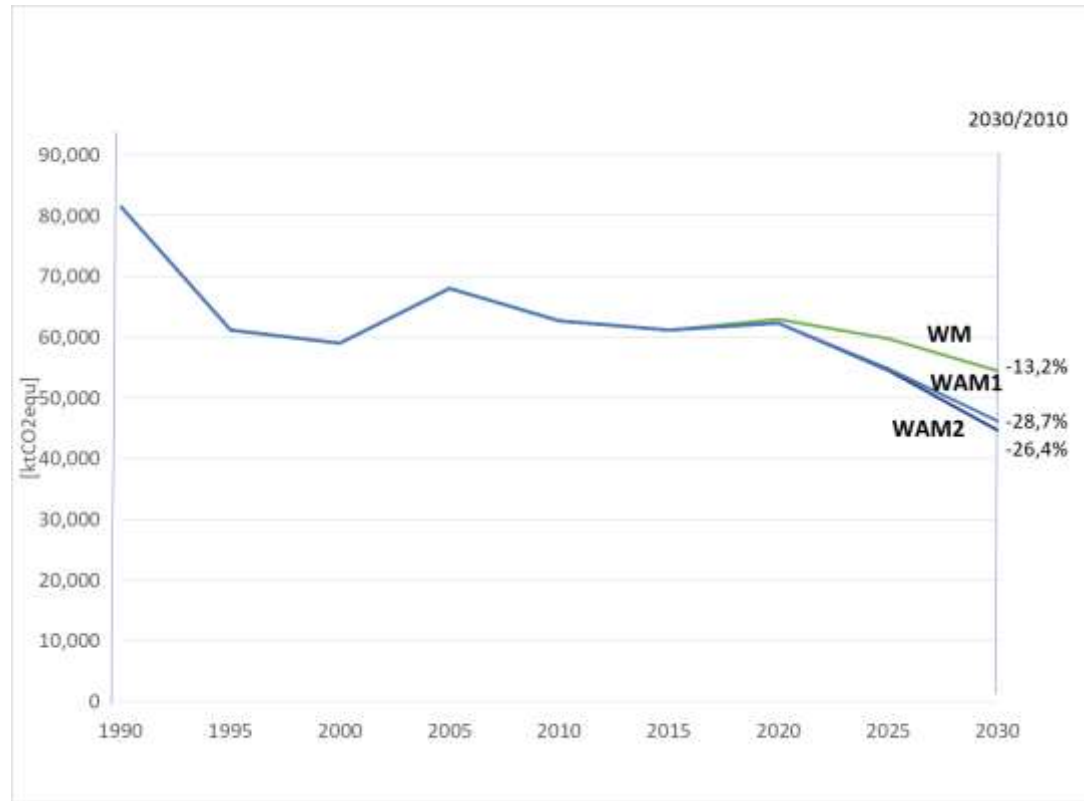


- Emissions from Energy industries are close (35,3MiotCO₂ in the SNC vs 36,8Miot CO₂eq in BaU)
- Emissions in manufacturing industries differ significantly (7,1miotCO₂ in the SNC vs 4,1miotCO₂) – main reason macroeconomy modelling
- Transport emissions are estimated higher in the SNC scenarios – different assumptions in fuel price and excise
- BaU includes also measures in the waste sector, that were not at all recognized by the SNC
- Much higher emissions in the agriculture sector (8,2Miot CO₂ vs 4,9 Miot CO₂)
- In addition, reason for differences is the modelling base year, that was 2010 for the SNC and 2015 for the BaU.

GHG Emissions from sectors



Mitigation scenarios

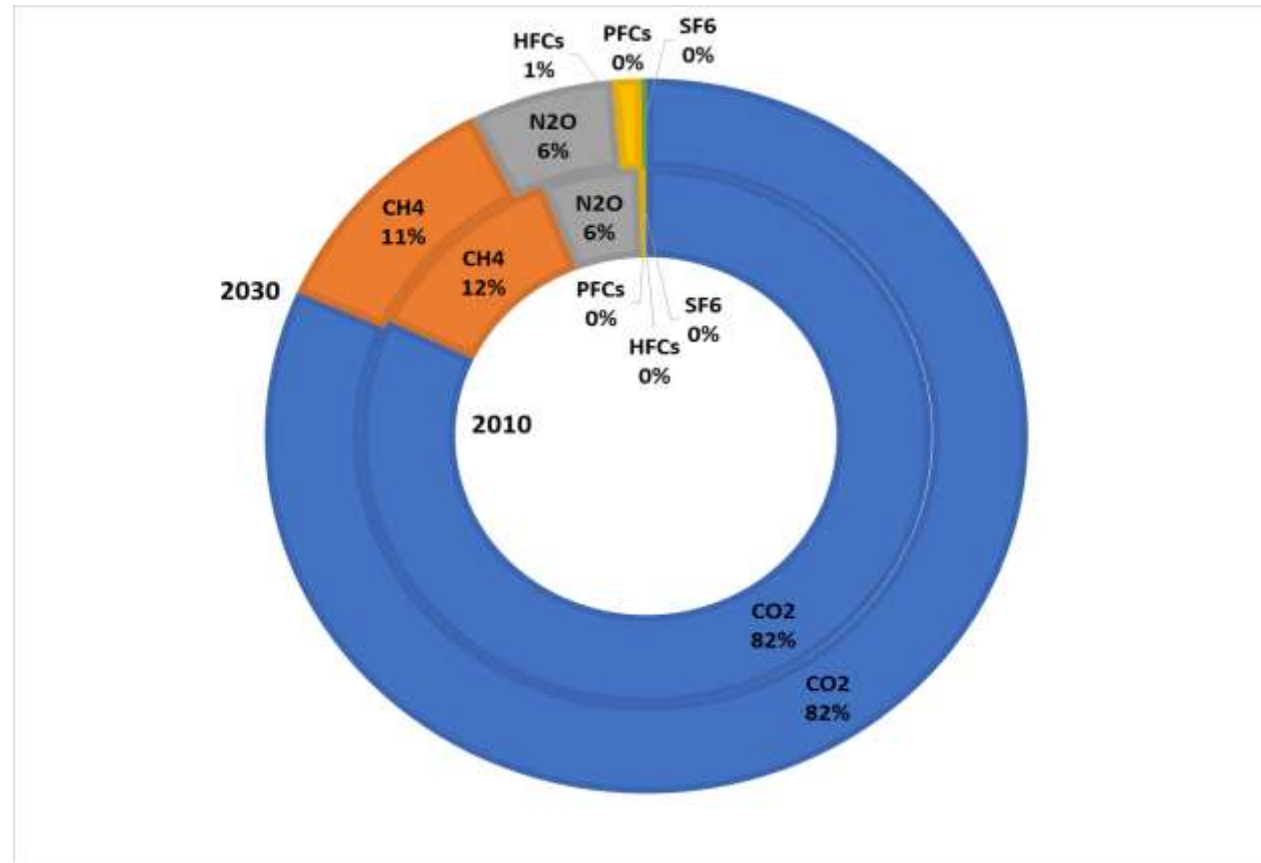


GHG emission reduction potential by different scenarios

Scenario	Target year/Year for Comparison	GHG emission reduction (%)	Target year/Year for Comparison	GHG emission reduction (%)	Target year/Year for Comparison	GHG emission reduction (%)
M2	2030/2010	13,2	2030/2005	20,1	2030/1990	33,3
M3	2030/2010	28,7	2030/2005	34,4	2030/1990	45,2
M4	2030/2010	26,4	2030/2005	32,2	2030/1990	43,4

- WM - GHG emission reduction of 33,3% compared to 1990 by 2030 - ambition is significantly increases compared to the GHG emission target submitted through the first Serbian NDC.
- WAM1 - includes additional measures and represents an increase of ambition by 2030, on 45,2% compared to 1990.
- A higher contribution to the EU 2030 targets, lie on an increase of efforts being required in the energy, agriculture and waste sectors, compared to the WM scenario.
- WAM 2 - reduction of GHG emissions by 43,4% compared to 1990 up to 2030

GHG emissions per gas - WM



The costliest scenario for Serbia is to ignore the climate related costs in its strategic decisions, **continuing an emissions pathway as assumed under the WM**