

Climate Change Research Priorities

Natasa Markovska, Senior Researcher,

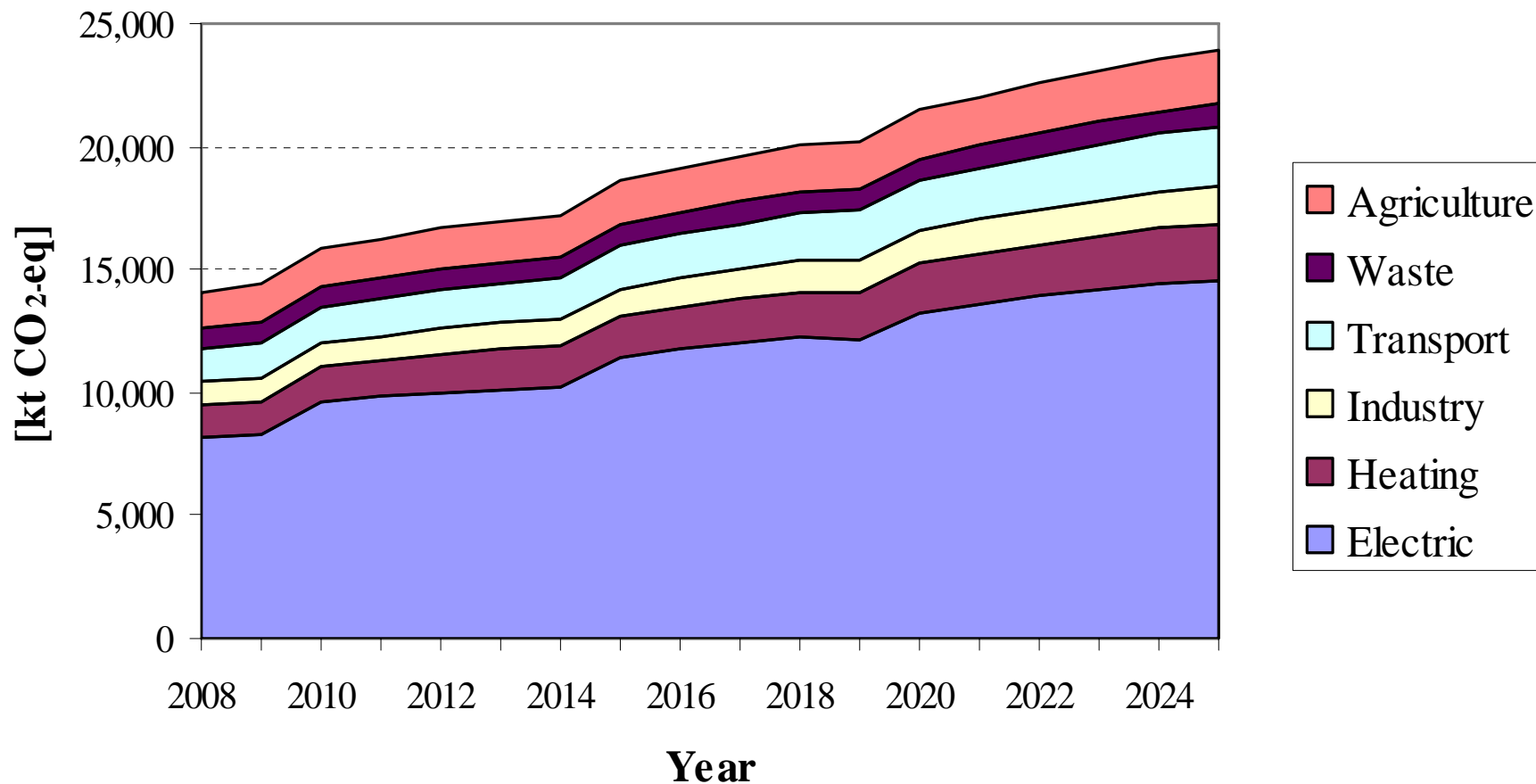
Research Center for Energy, Informatics and Materials,
Macedonian Academy of Sciences and Arts

(ICEIM-MANU)
Skopje, Macedonia

Climate Change - examples of good governance

- Partnership: Policy-making – Academia (lasts for more than a decade)
- CC in NSSD as a key challenge together with Clean Energy (in line with the EU SDS)
- CC in Sectoral strategies: Energy Strategy
 - Higher operational costs (purchase of emissions allowances)
 - Higher investment costs (request for BAT: Clean Coal, CCS)

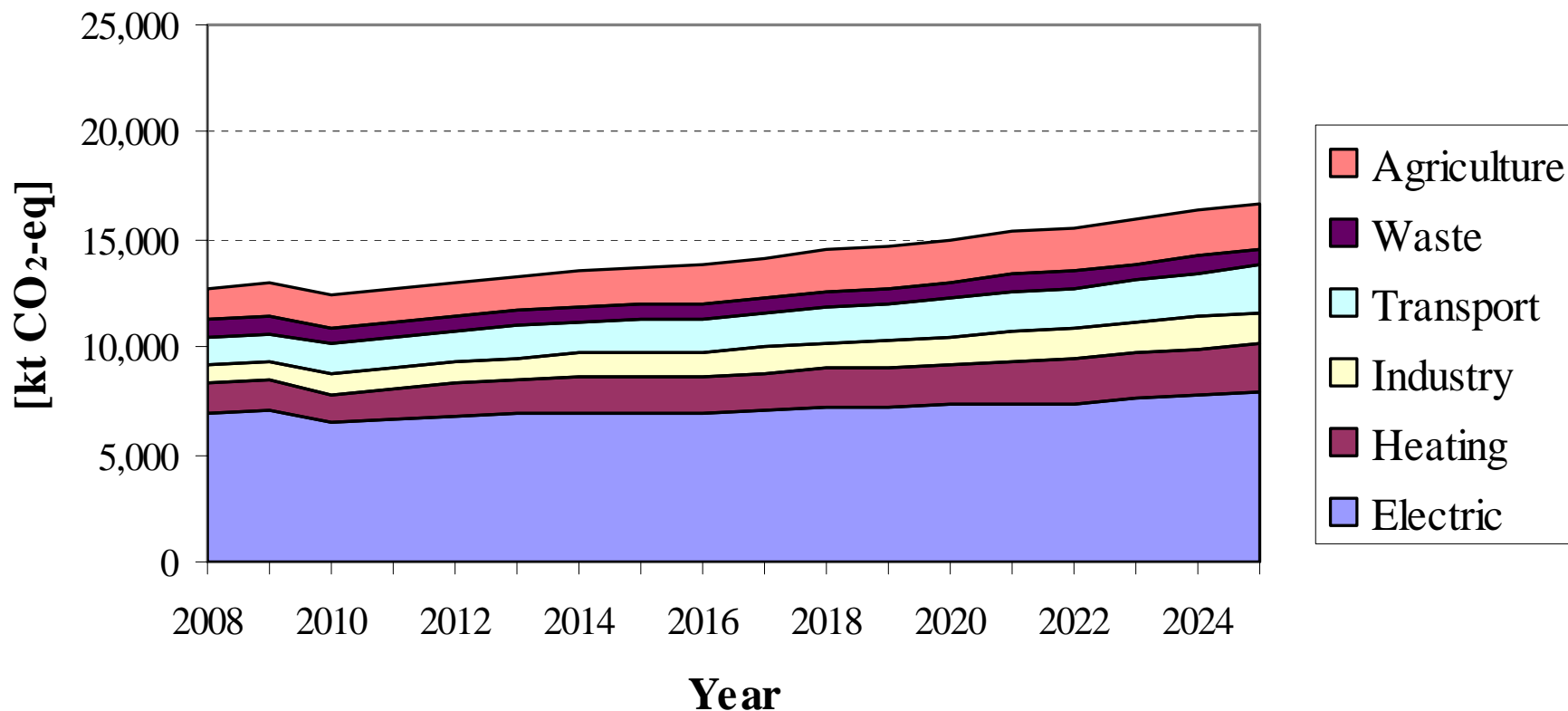
Projections of the total GHG emissions - Baseline scenario



CC Mitigation in Electricity Sector

- Introduction of gas fueled CHP (2 plants, 300 MWe each)
- Introduction of new renewables – small hydro, wind, PV (total 180 MW)
- Reduced consum (electricity market liberalization, Large consumers in first phase)

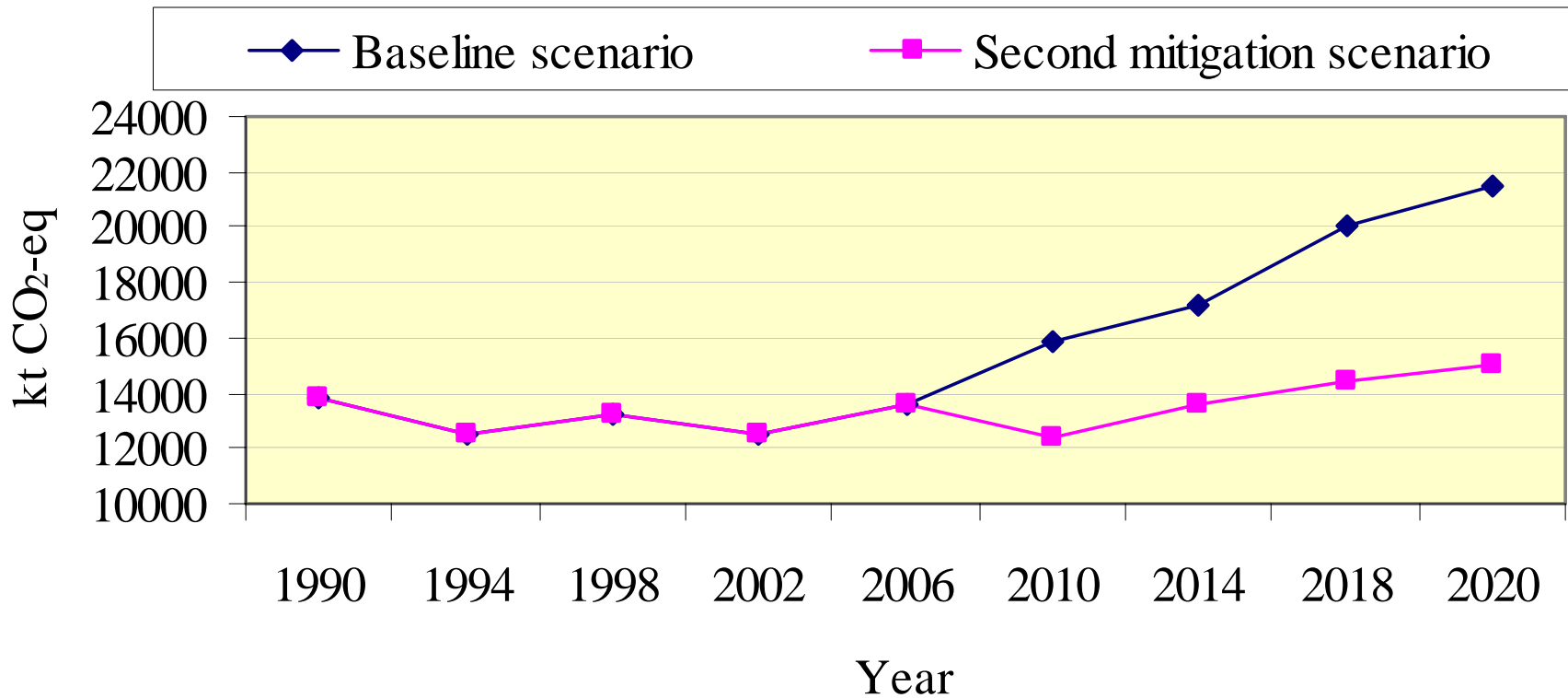
Projections of the total GHG emissions - Second mitigation scenario



Key values for the three scenarios

	2008-total GHG emissions [kt CO₂-eq]	2025 - total GHG emissions [kt CO₂-eq]
Baseline scenario	14,040	23,947
First Mitigation scenario	13,904	20,348
Second Mitigation scenario	12,645	16,713

Total GHG emissions 1990-2020



Baseline Scenario / Second Mitigation Scenario

2020-value (kt CO₂-eq): 21500/15000

Average annual growth rate (%): 3.6/1.4

Grid factor (kt CO₂-eq/kWh): 1.2 in 1990, increases slightly/ decreases for 22%, to 0.9

Energy and Climate package

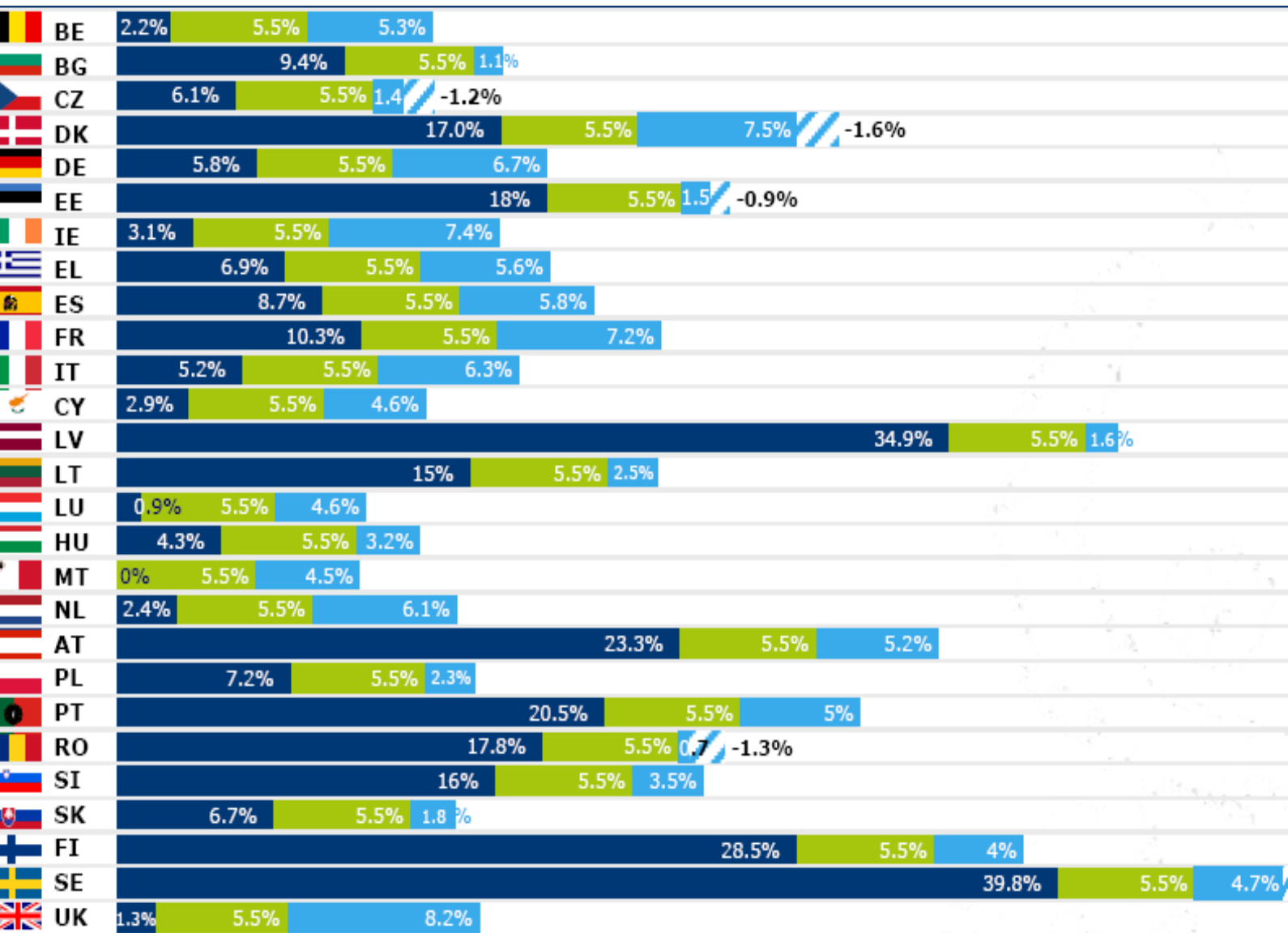
- 20% share of renewable energy sources (RES) in final energy consumption (RES TARGET)
- 20% reduction of greenhouse gases (GHG) emissions compared to 1990 levels (GHG TARGET)
- 20% improvement of energy efficiency (ENERGY EFFICIENCY TARGET)

RES TARGET:

Common European target (20% share) into
27 Members' national targets

In order to answer the question **whether the EU should adopt quantified targets** for the share of renewable energy in 2020 and if so, **for what amount and what form**, several analyses and studies have been realised including the contribution of external experts.

Several studies have been carried out and used in order to define the different elements of the proposal. These include the **FORRES 2020 report**: "Analysis of the EU renewable energy sources' evolution up to 2020, April 2005"; the **OPTRES report**: "Analysis of barriers for the development of electricity generation from renewable energy sources in the EU-25", May 2006; the **RE-GO project** "Renewable Energy Guarantees of Origin: implementation, interaction and utilization", **European Commission Contract No 4.1030/C/02-025/2002**; the **E-TRACK project** "A European Standard for the tracking of electricity", European Commission Contract No EIE/04/141/S07.38594; the **PROGRESS project** "Promotion and growth of renewable energy sources and systems", **European Commission Contract No TREN/D1/42-2005/S07.56988**; and the report by **MVV Consulting, June 2007**: "Heating and cooling from renewable energies: cost of national policies and administrative barriers". Regarding biofuels target impact on food prices, the study carried out by the Zentrum für Europäische Wirtschaftsforschung (**ZEW**) (**2007**): "Competitiveness effects of trading emissions and fostering technologies to meet the EU Kyoto targets", 2007.



RES share in 2005

Flat rate increase of 5.5%

Additional effort based on GDP per capita (multiplied by population)

Figures adjusted by early starter bonus

EU-27

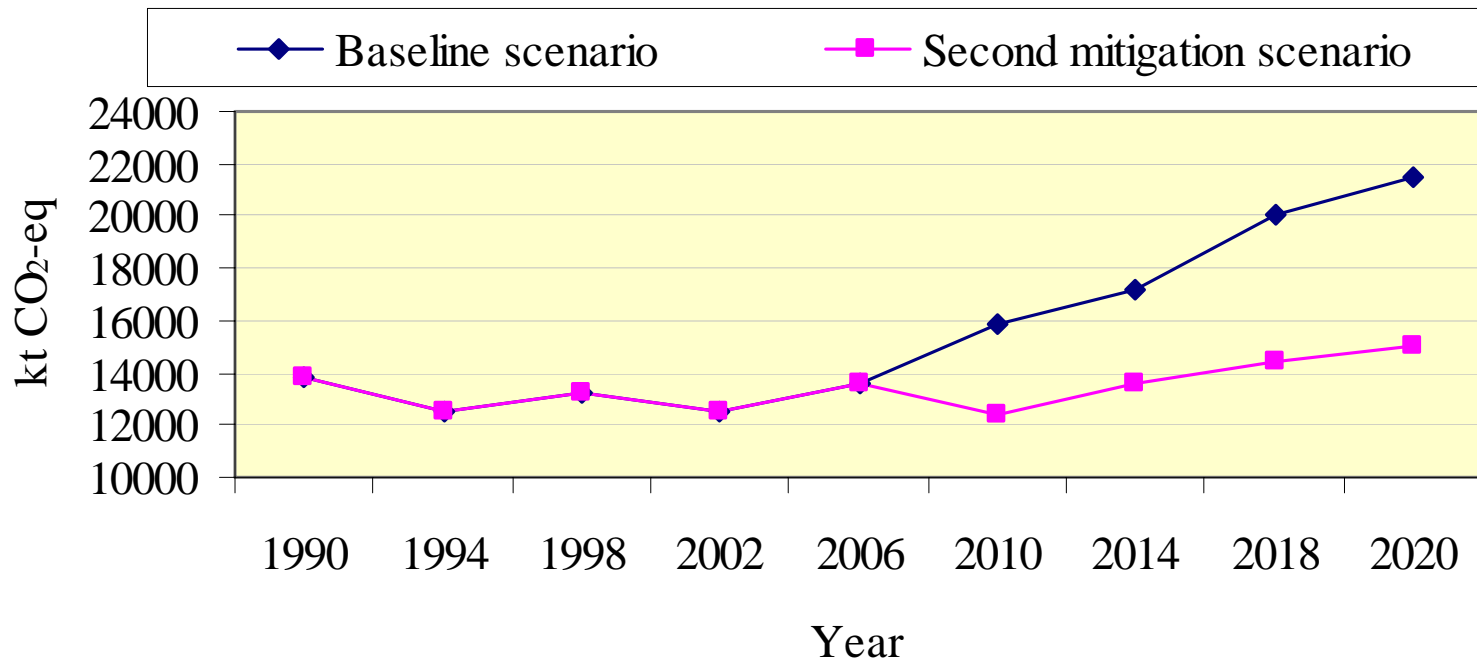
← EU 50% cap

RES TARGETS for EU Candidates

- No automatic translation of EU RES target
- **Need for regional project for determination of overall (regional) RES target and individual national RES targets**
- Target: Amount and Dynamics (RES potential, GDP, energy mix, and other country specifics)

GHG TARGETS for EU Candidates

- Non Annex I Country – currently, no quantitative target
- Future commitments: Limitation over the ANNUAL GROWTH RATE of emissions



GHG TARGETS for EU Candidates

- **Need for regional project for determination of overall (regional) GHG target and individual national GHG targets**
- Additional activities
 - CB through ETS pilot projects
 - Institutional setting, legislative support, technical knowledge
 - Regional cooperation in negotiating the targets
 - Building of NEGOTIATION capacities