

# **MODELLING EXERCISES FOR THE PREPARATIONS OF THE BIANNUAL UPDATE REPORT AND INDC**

## **MK CASE**

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Tirana, 18 March , 2015*



# Status of the MK FBUR

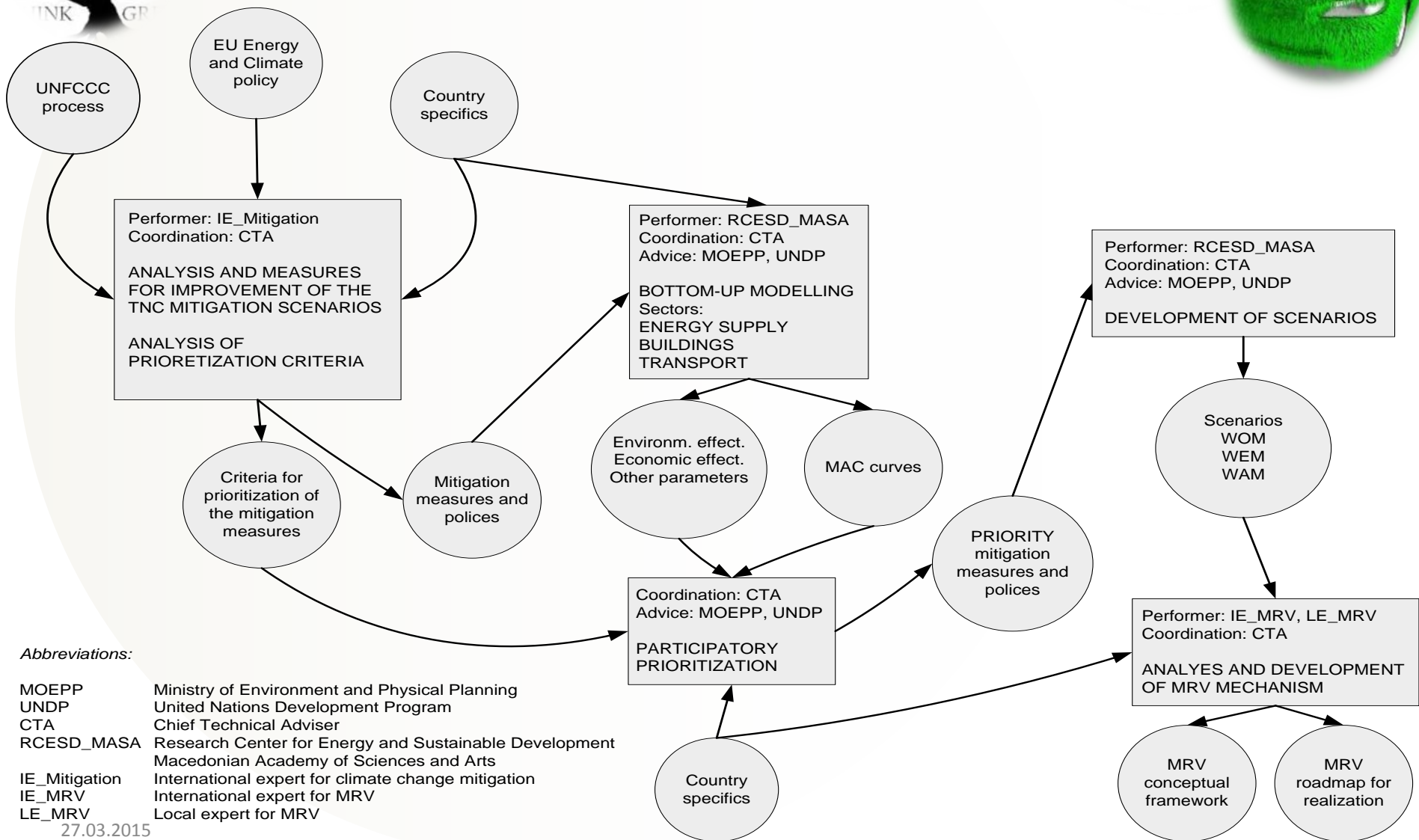


- The first non-Annex I country in Europe and the CIS region to submit its First Biennial Update Report on Climate Change to the UNFCCC, and the 11th country in the world to have done so.



<http://unfccc.int/resource/docs/natc/macbur1eng.pdf>

# The process and key players



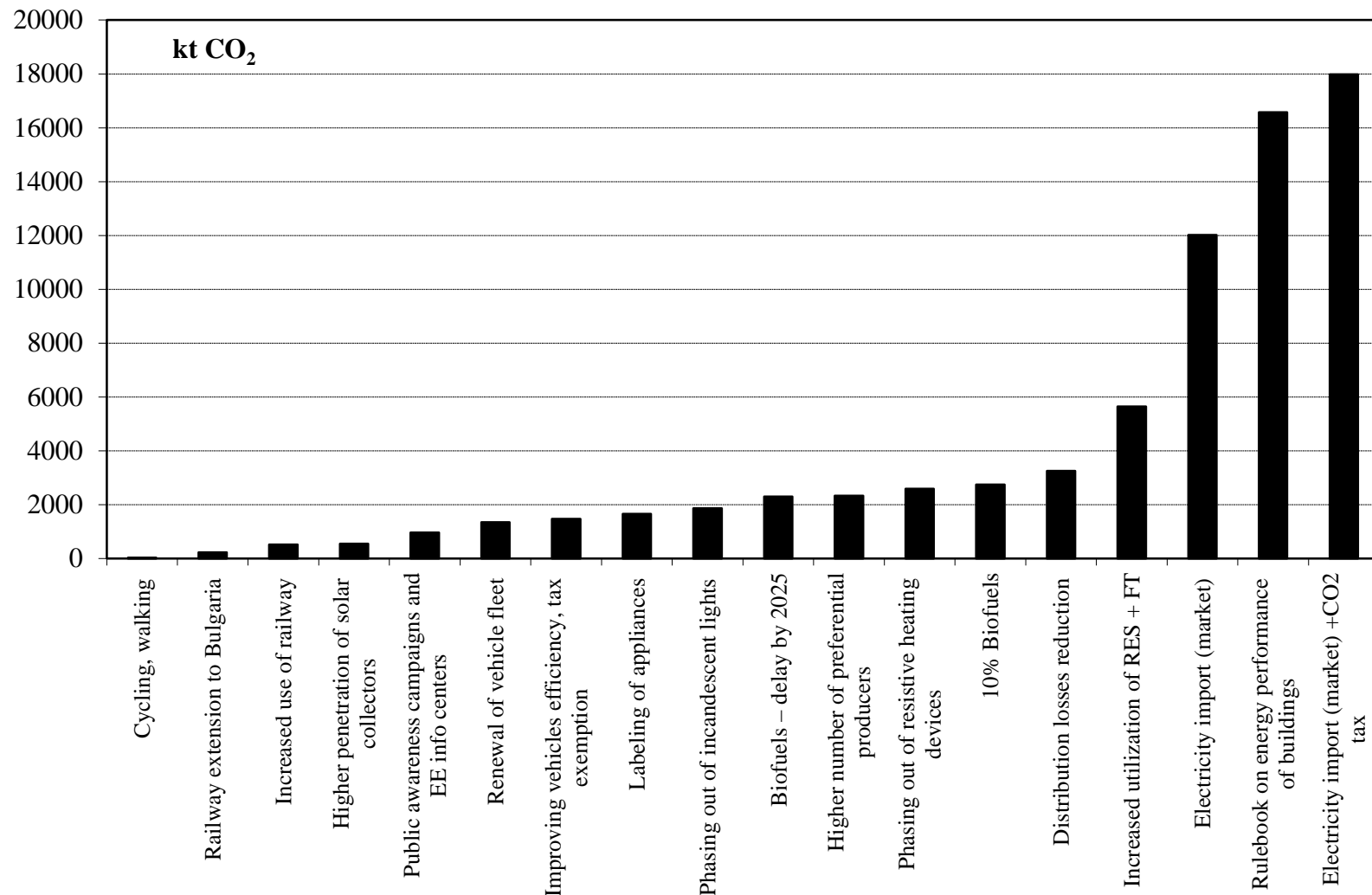


## WOM scenario – Key Assumptions

Сектор	Assumptions/Constraints
<b>Energy Supply</b> <b>Domestic resources</b> <b>Renewables</b> <ul style="list-style-type: none"> <li>• Large Hydro</li> <li>• Small Hydro, FT</li> <li>• Wind, FT</li> <li>• PV, FT</li> </ul>	<ul style="list-style-type: none"> <li>• No new large hydro power plants</li> <li>• 65.4 MW (Regulatory commission), FT = 90 €/MWh</li> <li>• 50 MW, FT 89 €/MWh</li> <li>• 18 MW , FT = 140 €/MWh</li> </ul>
<b>Import</b>	<ul style="list-style-type: none"> <li>• No limit on electricity import</li> <li>• Price of imported electricity 47 – 90 €/MWh (2014-2035)</li> </ul>
<b>Electricity production</b> <b>Tehnologies</b>	<ul style="list-style-type: none"> <li>• TP Oslomej fueled by imported coal</li> <li>• No nuclear</li> </ul>
<b>Gas pipeline</b>	No new gas pipeline
<b>Demand side</b>	The new technologies with the same efficiency as the existing ones, but there is a possibility for fuel switch

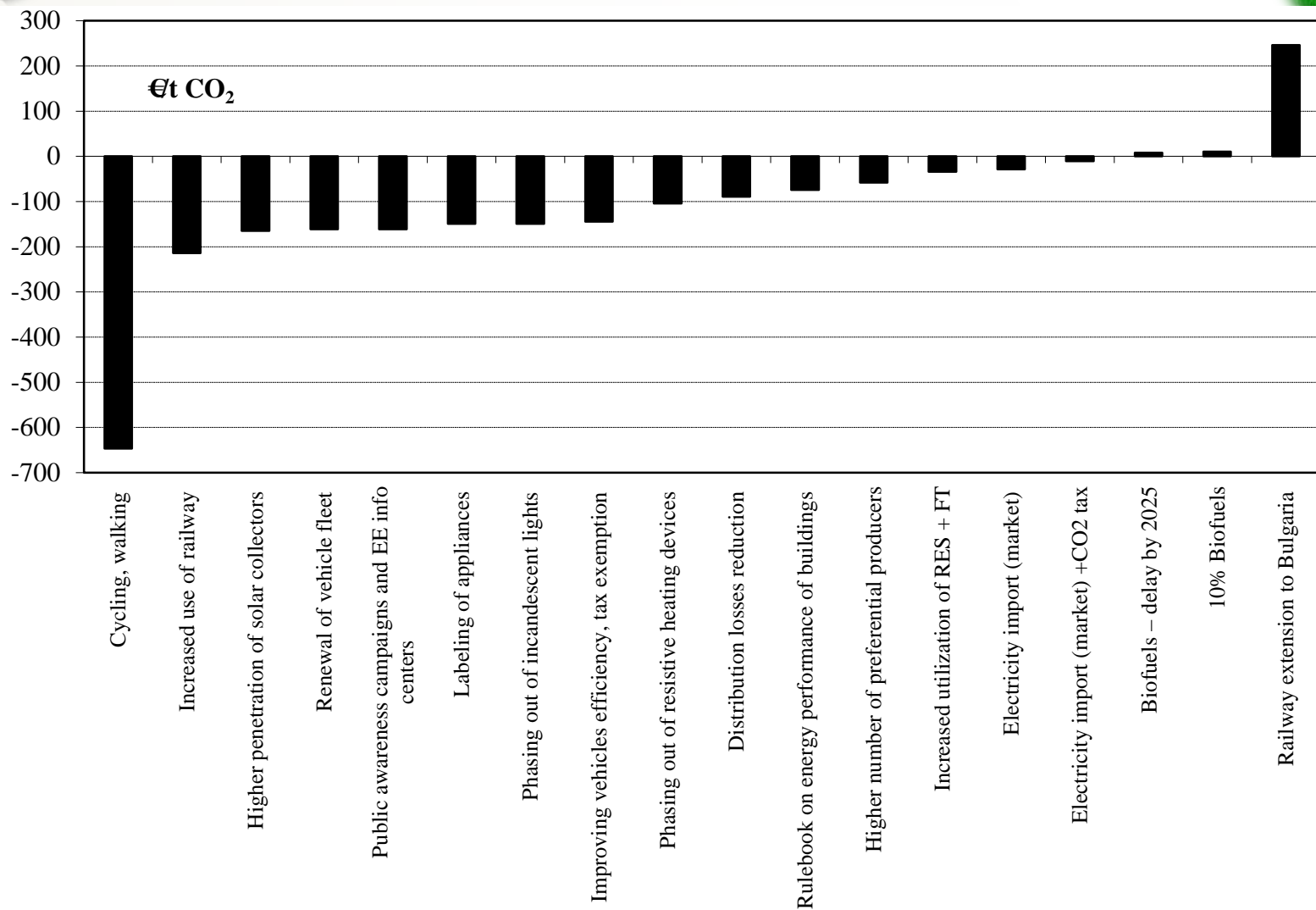


# CO<sub>2</sub> emissions reduction, cumulatively by 2030 – aggregate results





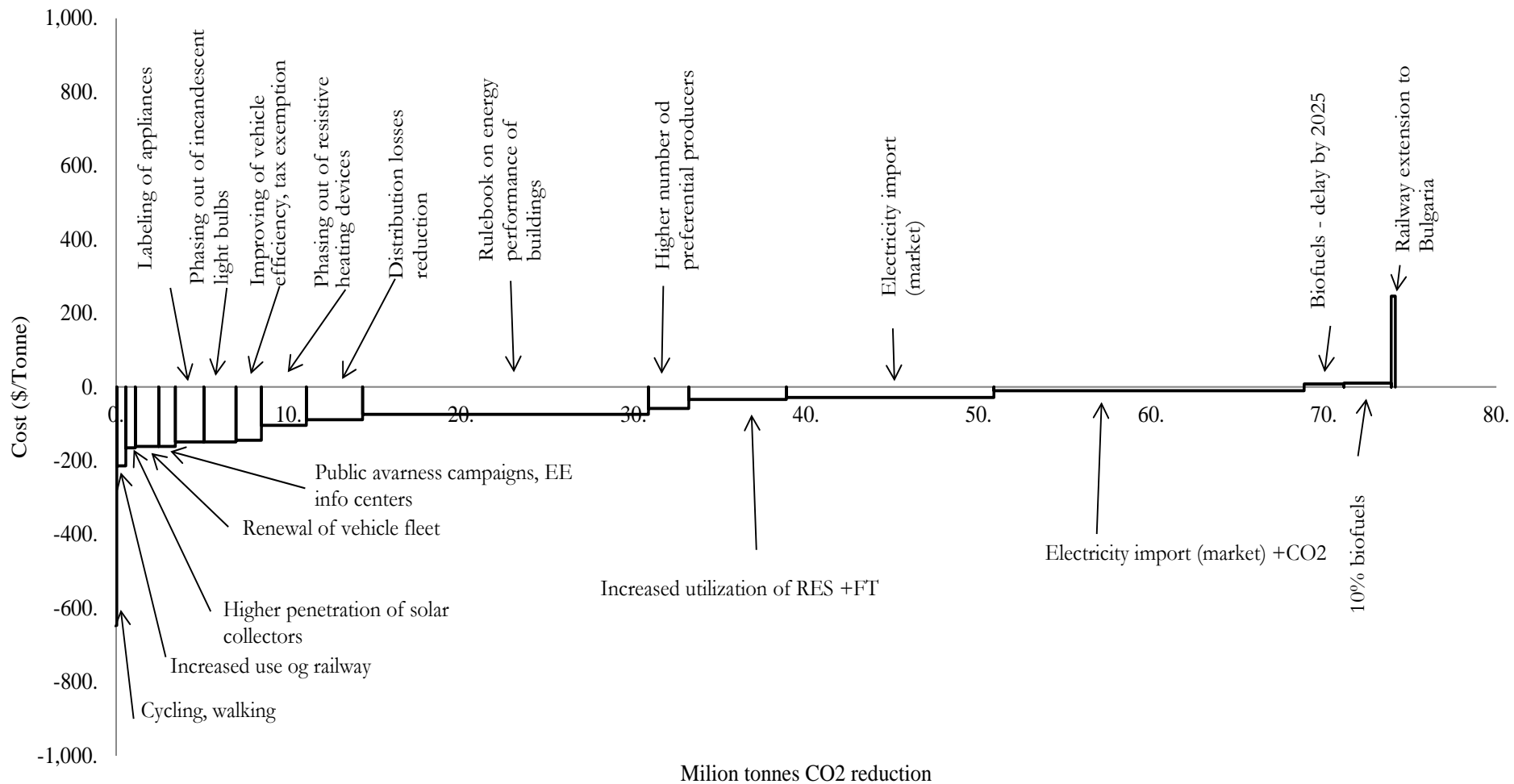
# Specific costs cumulative by 2030 – aggregate results







# Marginal Abatement Costs Curve based on cumulative reductions and costs cumulatively for 2030





# WEM scenario



## Sectors

## Mitigation measures

### Buildings

1. Labeling of appliances
2. Public awareness campaigns and energy efficiency info centers
3. Rulebook on energy performance of buildings

### Transport

4. Increased use of railway
5. Increased use of bicycles, walking and introduction of parking policy
6. Renewal of vehicle fleet

### Energy Supply

7. Distribution losses reduction
8. Electricity import (market)
9. Increased utilization of renewable energy sources
10. Biofuels – delay until 2025
11. Higher penetration of solar collectors





# WAM scenario



## Sectors

## Mitigation measures

### Buildings

1. Labeling of appliances
2. Public awareness campaigns and energy efficiency info centers
3. Rulebook on energy performance of buildings
4. **Phasing out of incandescent lights**
5. **Phasing out of resistive heating devices**

### Transport

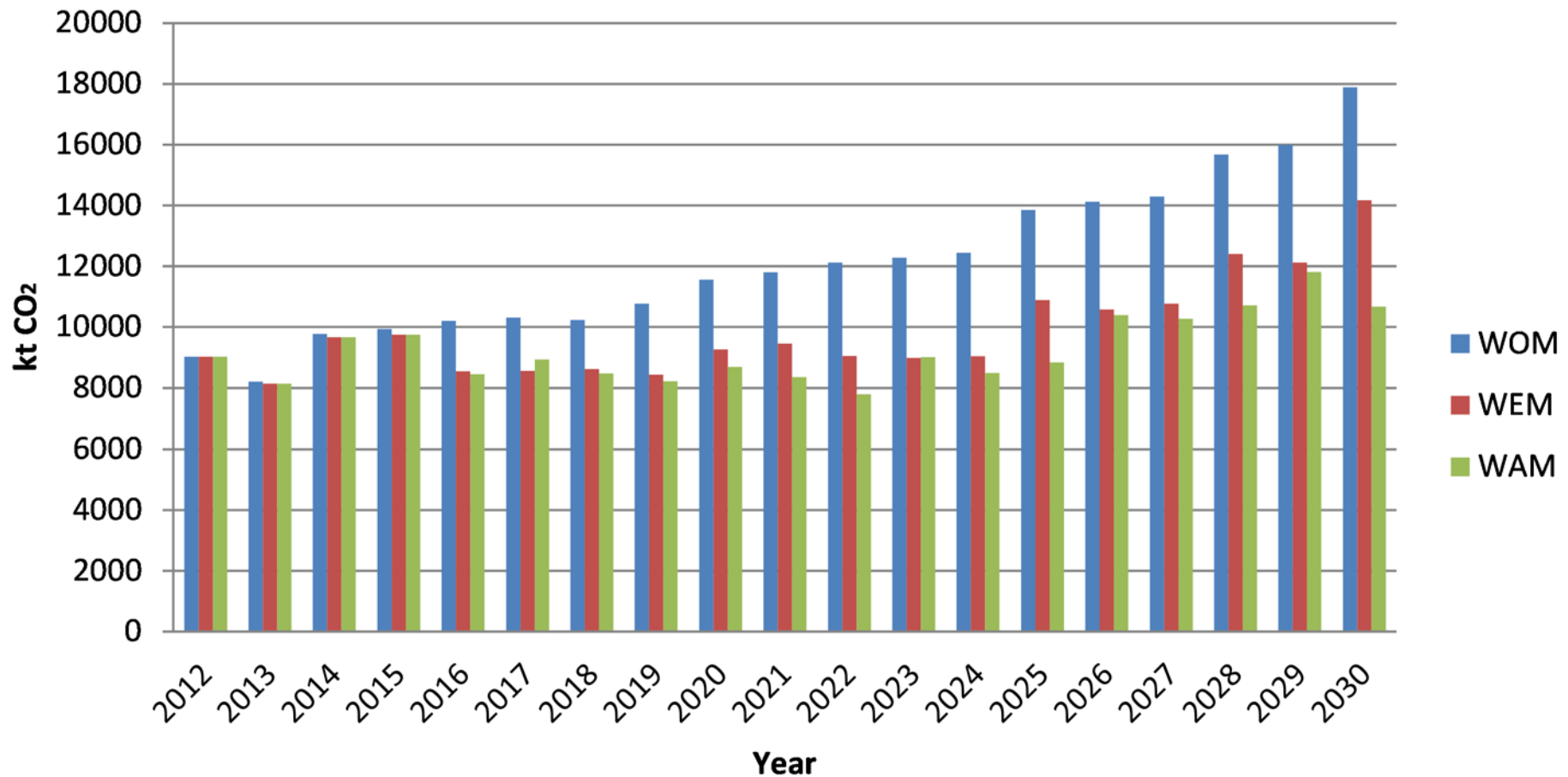
6. Increased use of railway
7. **Railway extension to Bulgaria**
8. **Improving vehicles efficiency, tax exemption for hybrid and electrical vehicles**
9. Increased use of bicycles, walking and introduction of parking policy

### Energy Supply

10. Distribution losses reduction
11. **Introduction of a CO2 tax and electricity import (market)**
12. Increased utilization of renewable energy sources



# Emissions





## Comparative Summary



	WOM	WEM	WAM
CO <sub>2</sub> emissions in 2020 (kt)	11,561	9,269	8,694
CO <sub>2</sub> emissions in 2030 (kt)	17,891	12,124	11,214
Cumulative CO <sub>2</sub> emissions by 2020 (kt)	90,033	80,007	79,348
Cumulative CO <sub>2</sub> emissions by 2030 (kt)	212,634	173,301	165,032
Reduction compared to WOM (CO <sub>2</sub> emissions in 2020)		20%	25%
Reduction compared to WOM (CO <sub>2</sub> emissions in 2030)		32%	37%
Reduction compared to WOM (cumulative CO <sub>2</sub> emissions by 2020)		11%	12%
Reduction compared to WOM (cumulative CO <sub>2</sub> emissions by 2030)		18%	22%



# Towards INDC...



- The three sectors covered - buildings, transport and energy supply, should be revisited, **to confirm/revise measures** in WEM and especially in WAM scenarios;
- The analysis should be extended to incorporate **other sectors** with substantial mitigation potential;
- Sensitivity analyses concerning the **base year** should be conducted (having in view relevant UN and EU processes) and most adequate base year should be agreed upon;
- Sensitivity analyses concerning the **target type** should be conducted (having in view relevant UN and EU processes) and most adequate target should be agreed upon;
- **Peaking year** should be determined for WEM and WAM scenarios;
- Given the EU candidate status, Macedonian mitigation contribution should be analyzed in the context of **EU 2030 climate and energy package**;
- The model should be refined so that **ETS and non-ETS sectors** may be modeled separately, having in mind different measures applied in them. ETS sector will be mainly governed by the price of emission certificates, while the non-ETS sector will continue to be governed by the national policies and measures;