Region-Specific Emission Targets

How to define region-specific emission targets, either as year-based targets or emission budgets:

Setting Emission Targets: `cm_emiMktTarget`
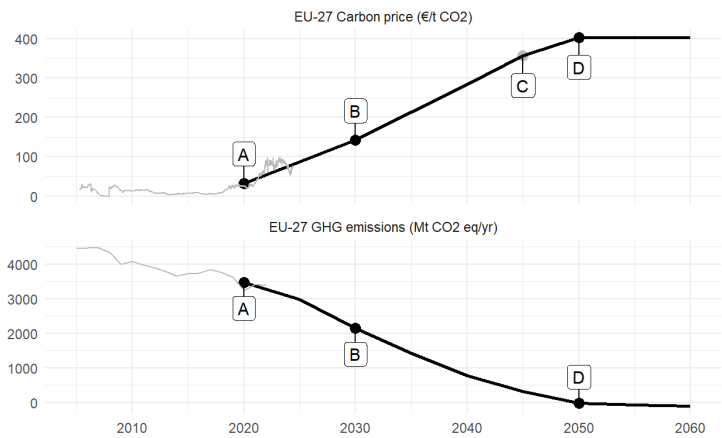
- require `regipol` to be set to `regiCarbonPrice`

Options

Option	Description
`off`	No regional emission target
`scenario_tag`	Targets defined in module 47 declarations under the scenario tag
`2020.2050.EU27_regi.all.budget.netGHG_noBunkers 72`	Explicitly defined target configuration

CO2 Tax Curve Shape

Segment	Description
Pre-target years	Linear increase from the starting year (`initial_year`) to the target year (`target_year`)
Post-target years	Annual increase based on the `cm_postTargetIncrease` value (in EUR per tCO2)

Examples

Example	cm_emiMktTarget	Description
Single Regional Target	`2020.2050.EU27.all.year.netGHG_LULUCFGrassi 0.0001`	EU27 economy-wide (`all`) 2050 net-neutrality (`2050`, `year`) of GHG with bunkers emissions and LULUCF Grassi shift (`netGHG_LULUCFGrassi`)
Multi-period Target	`2020.2030.EU27_regi.all.year.netGHG_LULUCFGrassi_intraRegBunker 2.191` , `2020.2050.EU27.all.year.netGHG 0.0001`	EU27 economy-wide (`all`) GHG emission target including only intra-region bunkers (`netGHG_LULUCFGrassi_intraRegBunker`) for 2030, and including full bunkers (`netGHG`) for 2050
Multi-period, Multi-regional Target	`2020.2030.EU27_regi.all.year.netGHG_LULUCFGrassi_intraRegBunker 2.191` , `2020.2030.DEU.all.year.netGHG_noLULUCF_noBunkers 0.42` , `(2035.2050.EU27_regi, 2035.2045.DEU, 2020.2050.UKI).all.year.netGHG_LULUCFGrassi 0.0001`	2030, 2045, and 2050 emission targets for different regions: Germany (`DEU`), `EU27`, and UK (`UKI`).
Enforcing Long-Term Targets (India Net-Zero Post-2070)	`2020.2070.IND.all.year.netCO2 0.001` , `2070.2090.IND.all.year.netCO2 0.001`	Ensures that India's net-zero target remains beyond 2070, preventing emissions from rebounding.

EU-27 target example (Germany and EU-27)

A. fixed historical value
B. EU-27 57% reduction: `2020.2030.EU27_regi.all.year.netGHG_LULUCFGrassi_intraRegBunker 2.191` and DEU 65% reduction: `2020.2030.DEU.all.year.netGHG_noLULUCF_noBunkers 0.42`
C. effect of DEU 2045 net-neutral target on EU-27 aggregated price: `2035.2045.DEU.all.year.netGHG_LULUCFGrassi 0.0001`
D. EU-27 net-neutral 2050 target: `2020.2050.EU27.all.year.netGHG_LULUCFGrassi 0.0001`

EU-27 Carbon price (€/t CO2)

EU-27 GHG emissions (Mt CO2 eq/yr)

Emission Target Definition

`cm_emiMktTarget` follows this format:

`initial_year . target_year . region . group_of_sectors . type_of_target . emissions_type   value`

Configuration Parameters

Parameter	Set	Values	Description
`initial_year`	`ttot`	year with four digits	Year when price increase starts and budget calculation begins
`target_year`	`ttot`	year with four digits	Year when the emission target or budget is achieved
`region`	`ext_reg`	ISO3 code or REMIND region code	Region where the target applies
`group_of_sectors`	`emiMktExt`	`all`, `ETS`, `ESR`, `other`	Targeted emission markets: all emissions, ETS market, Effort Sharing market, or other markets
`type_of_target`	`target_type_47`	`budget`, `year`	Emission target type: a cumulative budget or specific year-based reduction
`emissions_type`	`emi_type_47`	Various options (see below)	Specifies CO2 or GHG target type (net or gross, with/without LULUCF or bunker emissions)
`value`		Gt CO2e	Emission target value

Emission Type Options

- **CO2 Emission Targets:**
  - `netCO2`, `netCO2_noBunkers`, `netCO2_noLULUCF_noBunkers`, `netCO2_LULUCFGrassi`, `netCO2_LULUCFGrassi_noBunkers`, `netCO2_LULUCFGrassi_intraRegBunker`
  - `grossEnCO2_noBunkers`
- **GHG Emission Targets:**
  - `netGHG`, `netGHG_noBunkers`, `netGHG_noLULUCF_noBunkers`, `netGHG_LULUCFGrassi`, `netGHG_LULUCFGrassi_noBunkers`, `netGHG_LULUCFGrassi_intraRegBunker`, `netGHG_noLULUCF`

Tips

- To set a "zero target," avoid using exactly 0, as GAMS may disregard it. Instead, use a very small value, such as 0.001, to ensure it is recognized.