

Quick RICE50+ guide

Quick setup

- Have GAMS installed: you will need a working GAMS/CONOPT license (<https://www.gams.com/>).
- Run the model in Gams IDE/Studio or in the shell.

```
$ gams run_rice50x.gms
```

- Define run scenario passing flags as:

```
$ gams run_rice50x.gms --flagname=flagvalue
```

Main scenario settings

What follows is a summary of main model flags and settings. **Bolded** elements are values set as default and would apply unless otherwise explicited.

flag	values	description
policy	bau	Baseline with no damages
	bau-impacts	Baseline with damages active
	cba	Cost-benefit analysis
	cba-ndcs	Cost-benefit analysis starting from 2030 NDCs levels
	cea-cbudget	Carbon-budget limit (CO2)
baseline	cea-tatm	GMT increase limit (over pre-industrial)
	ssp1	Shared Socio-economic Pathways
	ssp2	
	ssp3	
	ssp4	
	ssp5	
cooperation	coop	Maximize aggregated welfare
	noncoop	Maximize self-interest (Nash eq.)
	coalitions	coop among coalition members, noncoop among coalitions
n	ed57	Regional specification
	r5	
	witch13	
	witch17	

	burke	
	djo	
impact	kahn	
	dice	
	off	
	sr	
bhm_spec	lr	Burke's function type (if impact is different than <i>burke</i> it is simply ignored)
	srdiff	
	lrdiff	
	witchco2	3-box with coeffs. corrected as in WITCH
climate	dice2016	DICE2016-R2
	cbsimple	Simple transient concentration response
	fixed	Starting differentiated and all converging to DICE-opt value
savings	free	Free variable to optimize
	1	Epstein-Zin disentangled welfare
disentangled	0	DICE welfare
gamma	0.5 number	Set inequality aversion (must be different than 1)
prstp	0.015 number	Set pure rate of social time preference
elasmu	1.45 number	Set elasticity of marginal utility of consumption
gama	0.3 number	Set capital elasticity in the production function

Startboost options

Startboost option uses another already-solved .gdx solution to load a *good* starting point for the model variables. A good startboost option may solve convergence problems and make the optimization much faster.

flag	values	description
<code>startboost</code>	<code>0 1</code>	Activate it to enable startboost logic
<code>startboost_manual</code>	<code>0 string</code>	Activate it to manually provide startboost gdx file name (<i>write it without .gdx extension</i>). Note that target file is searched inside <i>startboost</i> folder inside regional data folder (<i>i.e.</i> , <code>data_ed57/startboost/</code>)
<code>startboost_export</code>	<code>0 1</code>	Activate it to save current output as startboost source into startboost folder

Output settings

These flags are useful to set result files names.

flag	values	description
<code>nameout</code>	<code>string</code>	Set output gdx filename
<code>output_dir</code>	<code>string</code>	Set output results folder (default: <code>./results</code>)
<code>experiment_id</code>	<code>string</code>	Use this flag to gather results inside a common <code>output_dir/experiment_id</code> directory

Simulation options

RICE50+ can be run in simulation mode by providing *mitigation* (mandatory) and *savings* (optional) trajectories from an external .gdx file.

flag	values	description
<code>policy</code>	<code>sim</code>	Model in simulation mode
<code>sim_miu_gdx</code>	<code>string</code>	File .gdx (filename and relative path) from which extract regional mitigation (MIU.I) trajectories
<code>sim_savings_gdx</code>	<code>string</code>	File .gdx (filename and relative path) from which extract regional savings (S.I) trajectories

Simulation with exogen temperatures

RICE50+ can be run in simulation mode by providing *mitigation* (mandatory), *savings* (optional) and *exogenous temperatures* trajectories from an external .gdx file.

flag	values	description
policy	sim-exogen-temp	Model in simulation mode
exogen_source	treg	Import external regional temperature trajectories
	tatm	Import external atmospheric temperature trajectory
	treg_rcp	Regional temperatures follow RCP data trajectories
	treg_linear	Set GMT increase at 2100. Regional temperatures are linearized between 2015-2100 extremes.
exogen_source	26	Set reference RCP (only for exogen_source=treg_rcp)
	45	
	60	
	85	
exogen_tatm_2100	number	GMT increase at 2100 (only for exogen_source=treg_linear)
sim_miu_gdx	string	File .gdx (filename and relative path) from which extract regional mitigation (MIU.l) trajectories
sim_savings_gdx	string	File .gdx (filename and relative path) from which extract regional savings (S.l) trajectories
sim_temp_gdx	string	File .gdx (filename and relative path) from which extract: atmospheric temperature (TATM.l), only for exogen_source= tatm; regional temperatures (TEMP_REGION.l), only for exogen_source= treg