Revision Notice and Background on DICE models

May 23, 2024

DICE 2023

NEW: User's Manual for DICE-2023. An updated third edition of the User's Manual from May 2024 is now in its first draft (v.3.1.2). This has been prepared by William Nordhaus with contributions by Lint Barrage and Paul Sztorc. It has the background, modeling, and economic analysis behind DICE-2023, including the extensive background notes. It is available in "DICE folders."

DICE-2023-study publication. The study Lint Barrage and William Nordhaus, "Policies, Projections, and the Social Cost of Carbon: Results from the DICE-2023 Model," has been published in the *Proceedings National Academy of Sciences (US)* , March 19, 2024 and is available in "DICE-2023-manuscripts."

DICE-2023-Appendix. The Appendix to Lint Barrage and William Nordhaus, "Policies, Projections, and the Social Cost of Carbon: Results from the DICE-2023 Model," is online in *Proceedings National Academy of Sciences (US).* It is available in "DICE-2023-manuscripts."

GAMS program for DICE-2023. The most recent version of the DICE model © (named "*DICE2023-b-4-3-10.gams*") is provided in the folder *DICE-2023-GAMS-Oct2023*. That folder contains the GAMS code and a **.csv* file with the results of the model.

Excel program for DICE-2023. The revised version of Excel-DICE is now available. It is "DICE2023-Excel-b-4-3-10-v18.3.xlsx". This is harmonized with the GAMS program with the same name.

Background papers. The background papers that describe in detail the background for different modules have been updated to November 2023 and are contained in a folder, "*Background papers for DICE-2023*". These are named "*Background Notes on Discounting*", "*Background Notes on Damages*", "*Background Notes on non-CO2 forcings*", and "*Background Notes on DFAIR*".

ON RUNNING THE MODEL

The current version of DICE-2023 can be run with GAMS code. Unfortunately, the code requires purchasing a license, which costs around $1000 depending on whether you are an academic or a commercial users. One-year free trials of GAMS are also available, but they have limits on the size of the model and will require adapting the time horizon.

We are also looking into other languages for running DICE-2023, but those are unlikely to be available in the near future.

DICE 2016

DICE2016GAMS. The latest published version of the DICE-2016R3 model is provided in the folder "*DICE2016*".

This was used for the Nobel lecture and manuscript (see *American Economic Review*, April 2019). Slightly different versions were in other manuscripts.

This version can be run as baseline and optimized simply by setting that control variable at the top of the program. Other scenarios (such as temperature limits) require setting limits in the program itself. Note that running this requires the proprietary version of GAMS.

DICE2016Excel. An Excel version from a slightly earlier version (DICE-2016R) will be made available shortly. Note that this is derived from the GAMS version and is not the authoritative version. It does not contain the optimization at present.

DICE Publications. The DICE-2016 model is the background for several papers on climate change. See the folder "*DICE Publications*" for a selective list.

Earlier USER'S MANUAL

DICE-Manual. William Nordhaus and Paul Sztorc have written an extensive User's Manual that explains the DICE model and is applicable to DICE-2013. It has not been updated but have most of the same features as DICE-2016 and the forthcoming DICE-2022.

RICE-2023

A current version of the regional model (RICE) has been developed by Zili Yang of State University of New York at Binghamton. Please contact him at zlyang@binghamton.edu for information on the model.