

Supporting document for Argonne experiments
2nd group of simulations
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This document helps GTAP users with preliminary knowledge about RunGTAP5 program to replicate the second group of experiments developed in Tyner et al. (2010). One needs to follow all experiments and their steps according to this guideline to replicate the land use changes associated with the second group of simulations. Then the land use changes should be transferred to an Excel file (introduced in this guideline later on) to calculate the land use emissions for the second group of simulations. Before running the simulations, please read this instruction entirely.

Steps to replicate land use changes

- 1- Save archive folder name “ARG2C1” in your computer.
- 2- Launch RunGTAP5 program.
- 3- From the top menu of RunGTAP5 select: File\Version Archive\Load ZIP. Navigate the system to the folder where you saved the zip file “ARG2C1” and click on the “open” button. The system will restore the archive folder in RunGTAP5. Now the current version of RunGTAP5 is “ARG2C1”.
- 4- From the menu of RunGTAP5 select the “Solve” button.
- 5- Then click on the “Load Experiment” button. You will see the following list:
 - G2C1N: Group two: 2001 to 2006 with no ethanol,
 - G2C1W: Group two: 2001 to 2006 with ethanol,
 - G2C2: Group two: 2006 to 7 BG,
 - G2C3: Group two: 7 to 9 BG,
 - G2C4: Group two: 9 to 11 BG,
 - G2C5: Group two: 11 to 13 BG,
 - G2C6: Group two: 13 to 15 BG.

From the list click on the “G2C1N” experiment and then click on the “OK” button. Now click on the “Solve” button to run the simulation. The simulation may take a long time to reach the solution. When the system is reached to the solution, go to the list of experiments again and this

time select the “G2C1W” experiment and solve it. When the system is reached to the solution of this experiment, then go to the next step.

6- From the top menu of the RunGTAP5 select “Version\New” and then click on “next”. You will see a new window. In this window check the “Same aggregation as current version” and “Using updated database from last simulation” options. Then type in “ARG2C2” in the box for “New version name”. Then click on the “Next” button. The system will open a new window in this window again click on the “Next” button. The system will open a new window, in this window click on the “FINISH” button and wait to see the following message: “about to switch to new version-please wait while test simulation is performed.” Now click on the “Ok” button and wait while the test is running. When the test is finished go to the next step.

7- Repeat step 5 for experiment “G2C2”.

8- Repeat step 6 and generate “ARG2C3”.

9- Repeat step 5 for experiment “G2C3”.

10- Repeat step 6 and generate “ARG2C4”.

11- Repeat step 5 for experiment “G2C4”.

12- Repeat step 6 and generate “ARG2C5”.

11- Repeat step 5 for experiment “G2C5”.

12- Repeat step 6 and generate “ARG2C6”.

13- Repeat step 5 for experiment “G2C6”.

14- Now you have the simulation results for all experiments of the second group of simulations. Results are stored in the following folders:

- C:\RunGTAP\ARG2C1\SAVESIMS
- C:\RunGTAP\ARG2C2\SAVESIMS
- C:\RunGTAP\ARG2C3\SAVESIMS
- C:\RunGTAP\ARG2C4\SAVESIMS
- C:\RunGTAP\ARG2C5\SAVESIMS
- C:\RunGTAP\ARG2C6\SAVESIMS

Updated data bases are stored in these folders. In the folder of

“C:\RunGTAP\ARG2C1\SAVESIMS” there are “G2C1N.upd” and “G2C1W.upd”. The former file is the updated data base obtained from the baseline simulation for 2001-2006 with no shock

for US ethanol. The latter file is the updated data base obtained from the baseline simulation for the same time period with a shock for US ethanol. Open these files and export their LANDCOVER_L headers with the aggregation combination of (sum AEZ_COMM, all LCOVER4_INDS, all REG) to an Excel file. Then calculate the differences between the corresponding elements of these headers (LCOVER_L of G2C1W minus LCOVER_L of G2C1N) to obtain the land use changes due to ethanol production for the time period of 2001-2006.

Now you need to use the updated data bases stored in other folders listed above to export their LANDCOVER_L headers to your Excel file. Now calculate the following differences to obtain land use changes for other experiments of the second group of simulations:

- 2006 to 2007 BG: LANDCOVER_L of G2C2 minus LANDCOVER_L of G2C1W,
- 2007 to 2009 BG: LANDCOVER_L of G2C3 minus LANDCOVER_L of G2C2,
- 2009 to 2011 BG: LANDCOVER_L of G2C4 minus LANDCOVER_L of G2C3,
- 2011 to 2013 BG: LANDCOVER_L of G2C5 minus LANDCOVER_L of G2C4,
- 2013 to 2015 BG: LANDCOVER_L of G2C6 minus LANDCOVER_L of G2C5.

Calculate land use emissions

Finally, copy and paste the land use changes into the Excel file “Land use emissions_G2.xls” sheet “Land Use All Periods” in the following ranges:

- Time period of 2001-2006: B6-D25,
- Time period of 2006-2007: B34-D53,
- Time period of 2007-2009: B62-D81,
- Time period of 2009-2011: B90-D109,
- Time period of 2011-2013: B118-D137,
- Time period of 2013-20015: B145-D165.

Now you can go to other sheets of this Excel file and find tables of land use changes and land use emissions reported in the Tyner et al. (2010) for the second group of simulations.