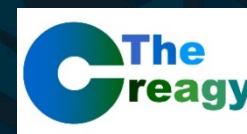


World Bank and TGO

E3-Thailand software and how to run

Project: Impacts of carbon pricing instruments on national economy and contribution to NDC – Thailand

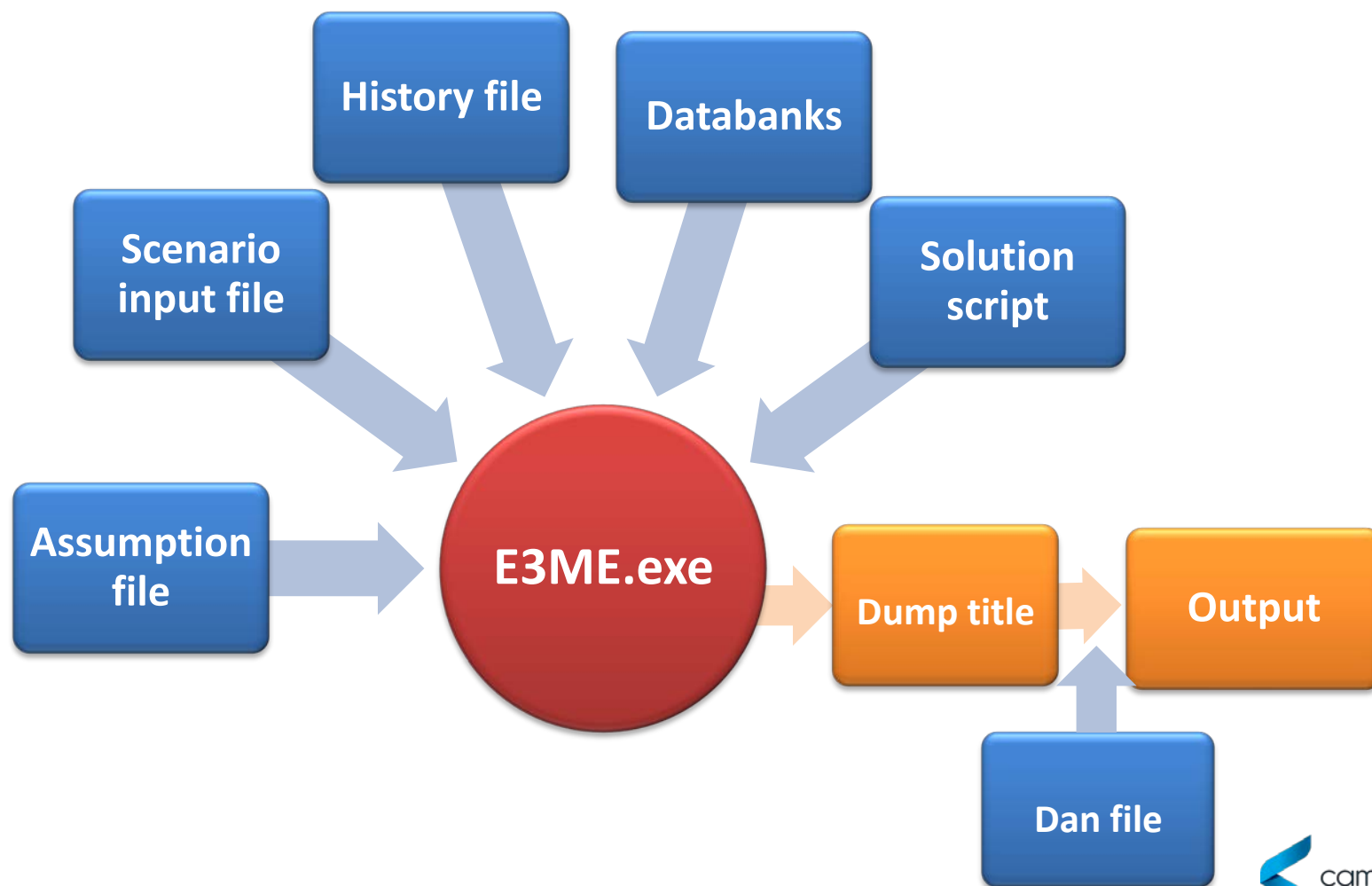


Unnada Chewpreecha and
Sophie Heald

14 February 2019



Overview of the E3-Thailand software



What are the files?

Assumption

- A text file which contains model exogenous assumptions

Scenario

- A text file which contains model policies inputs

History

- A text file which contains commands for reading in data over historical periods, parameters, classifications and switches

Databanks

- Collections of model databanks: historical economic, energy-environment, parameters, forecasts and residuals

Solution Script

- A text file calling model inputs above and the E3-Thailand executable E3ME.exe

E3ME.exe

- An executable, compiled version of the E3-Thailand model codes

Dumptitle

- Model output stored in 'dumtitle' (not human-readable) storage

Dan

- A text file extracts model results from dumtitle and save to text file format

Model manual and download link

<https://www.camecon.com/what/our-work/e3-thailand/>

The E3-Thailand Manager software

- A user-friendly, simple software where model users can edit model inputs, run model, and display model results
- Open in internet browsers

[E3ME-Thailand](#) [Introduction](#) [Instructions](#) [Scenarios](#) [Assumptions](#) [Variables](#) [Running the model](#) [Model results](#)

E3-Thailand Model Manager

Version Final

2018 Cambridge Econometrics

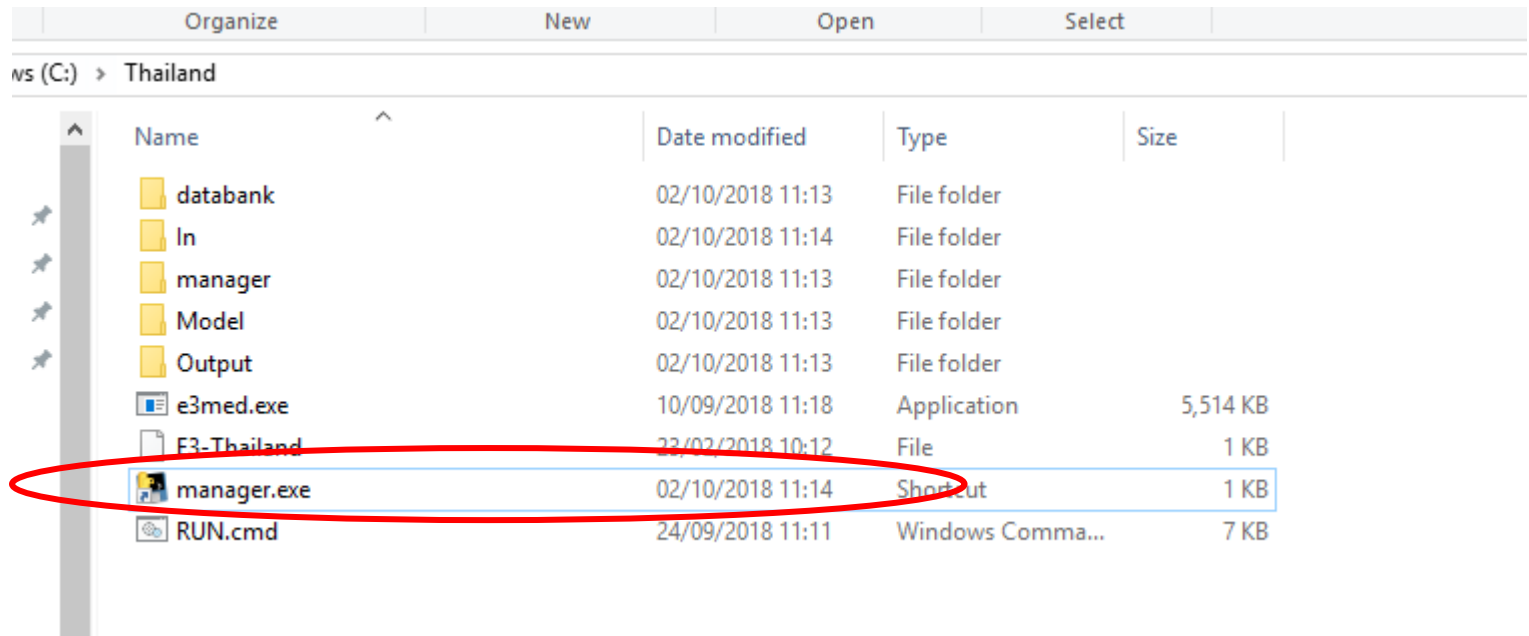
Welcome to the E3-Thailand model manager. This is a place where model users can edit model inputs, run model, and display model results.

Note(s)

- Instructions: contains model text file (.idiom) input
- Scenarios: contains model scenario text file (.idiom) for model policy inputs
- Assumptions: contains model assumption text file (.idiom) for model exogenous assumptions
- Variables: contains a full list of E3-Thailand model variables
- Running the model: allows users to set up and run the E3-Thailand model with different input and output options
- Model results: display model run results (export to csv file)

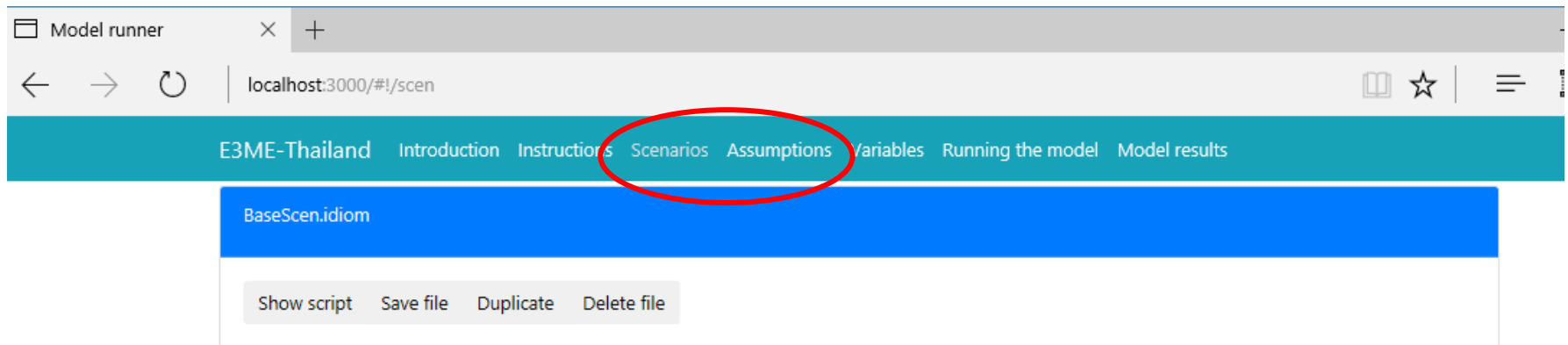
Step1: Launch the Manager software

- After downloading launch the Manager software in the model folder
- This will launch the model in your default internet explorer



Step 2: Edit scenario inputs

- To edit the scenarios or assumption files select the scenarios or assumptions tab in the model manager



Step 2: Edit scenario inputs (cont)

Here, a scenario is opened and we have entered a carbon tax. This image is an example of how a scenario might be edited in Manager

The screenshot displays the E3ME-Manager web interface. The browser address bar shows 'localhost:3000/#/scen'. The navigation menu includes 'E3ME-Thailand', 'Introduction', 'Instructions', 'Scenarios', 'Assumptions', 'Variables', 'Running the model', and 'Model results'. The main content area shows two sections: 'BaseScen.idiom' and 'S_NDC.idiom', each with 'Show script', 'Save file', 'Duplicate', and 'Delete file' buttons. A scrollable list of scenario inputs is visible, with 'RTCA carbon tax as additional excise duties (baht/tCO2) 2001-50' highlighted in blue. Below this, a table shows values for years 2019-2027, with the header row circled in red.

2019	2019	2020	2021	2022	2023	2024	2025	2026	2027
0	1005	1024	1044	1063	1084	1104	1125	1147	1169

Step 3: Run the model

To run the model select the input file, assumption and scenarios you want to use.

Specify a name for your output file.

Select “Run the model” in order to run the model

E3ME-Thailand Introduction Instructions Scenarios Assumptions Variable **Running the model** Model results

Input instructions
EnForecast

Assumptions
Assumptions

Scenario
S_CT1

Output file
CarbonTaxRun1

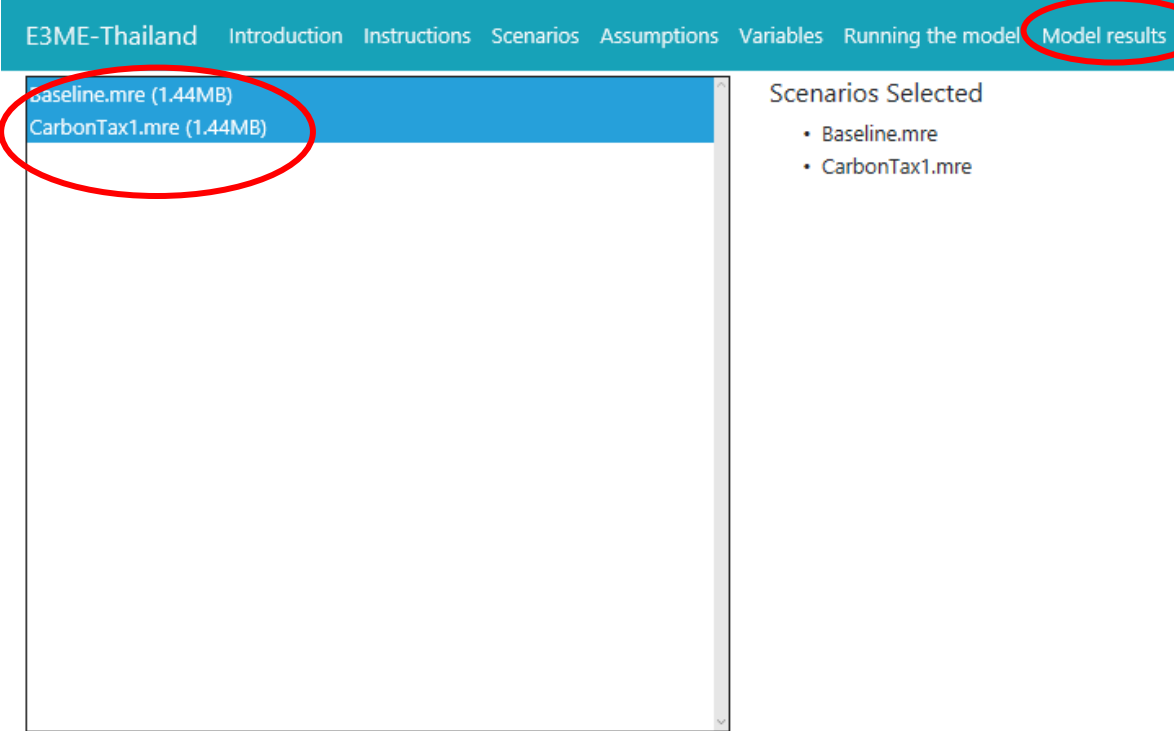
In History Asns\Assumptions Scenarios\S_CT1 Databank Output\ Dump VER\QHIST
In EnForecast Asns\Assumptions Scenarios\S_CT1 Databank Output\ Forecast VER\QEnForecast
In Dan1 Asns\Assumptions Scenarios\S_CT1 Databank Output\ CarbonTaxRun1 VER\QDAN

Run the model Stop the run

```
E3-Thailand SUMMARY SOLUTION FOR EACH YEAR
Last iteration for 1 region(s) as % change (D) previous year:
DATE IT CO2 DGGDP DSC DSV DSX DSM DPSH DPCE DPSX DPSM DAW BTRA PBRA UNRA
1995 4 0.1*****
1996 3 0.2 5.7 5.8 6.9 -4.1 -2.2 3.1 5.2 8.2 6.7 5.6 0.0 0.0 1.2
1997 3 0.2 -2.8 -1.0-21.2 8.1 -6.1 2.5 5.2 15.1 15.0 1.1 0.0 0.0 1.0
1998 4 0.1 -7.6 -9.0-44.5 12.7-19.4 8.8 8.8 8.2 12.1 1.3 0.0 0.0 3.6
1999 3 0.1 4.6 3.1 -3.8 8.2 11.1 -0.9 1.2 -8.6 -4.3 3.6 0.0 0.0 3.2
2000 3 0.2 4.5 7.0 4.2 14.5 19.8 0.5 0.8 5.0 7.2 2.5 0.0 0.0 2.6
2001 3 0.2 3.4 6.1 1.7 1.4 4.5 2.1 2.2 2.9 4.9 4.7 0.0 0.0 2.8
2002 3 0.2 6.1 6.4 6.2 5.9 6.1 2.1 0.9 -2.3 -3.2 3.7 0.0 0.0 2.0
2003 3 0.2 7.2 6.7 12.6 9.2 11.4 2.6 2.3 1.8 0.1 6.9 0.0 0.0 1.6
2004 3 0.2 6.3 7.4 15.8 12.9 18.9 2.9 3.2 3.0 1.9 9.0 0.0 0.0 1.6
2005 5 0.2 4.2 4.3 14.4 7.7 15.8 4.5 4.9 5.4 6.5 6.3 0.0 0.0 1.5
2006 5 0.2 5.0 4.3 2.4 11.1 3.9 6.4 4.6 -0.0 0.9 6.8 0.0 0.0 1.3
E3-Thailand SUMMARY SOLUTION FOR EACH YEAR
Last iteration for 1 region(s) as % change (D) previous year:
DATE IT CO2 DGGDP DSC DSV DSX DSM DPSH DPCE DPSX DPSM DAW BTRA PBRA UNRA
2007 3 0.2 5.4 2.3 1.7 9.2 4.0 3.2 3.2 -0.5 -3.3 6.7 0.0 0.0 1.3
2008 5 0.2 1.7 3.3 2.7 6.0 12.4 3.4 5.3 4.4 8.6 5.6 0.0 0.0 1.3
2009 5 0.2 -0.7 -1.9-11.7-12.8-23.0 0.4 0.3 2.2 -0.2 3.4 0.0 0.0 1.6
2010 5 0.2 7.5 7.0 12.0 14.0 22.2 3.7 3.2 1.1 0.9 5.7 0.0 0.0 1.1
2011 5 0.2 0.8 4.9 5.6 9.7 11.9 4.3 3.7 1.8 5.4 6.4 0.0 0.0 0.8
2012 5 0.2 7.2 9.2 10.9 4.9 5.8 0.8 1.6 2.6 3.3 10.7 0.0 0.0 0.7
2013 5 0.2 2.7 3.7 -0.9 2.5 2.3 2.1 1.4 -0.6 -2.3 6.7 0.0 0.0 0.9
```

Step 4: Display results

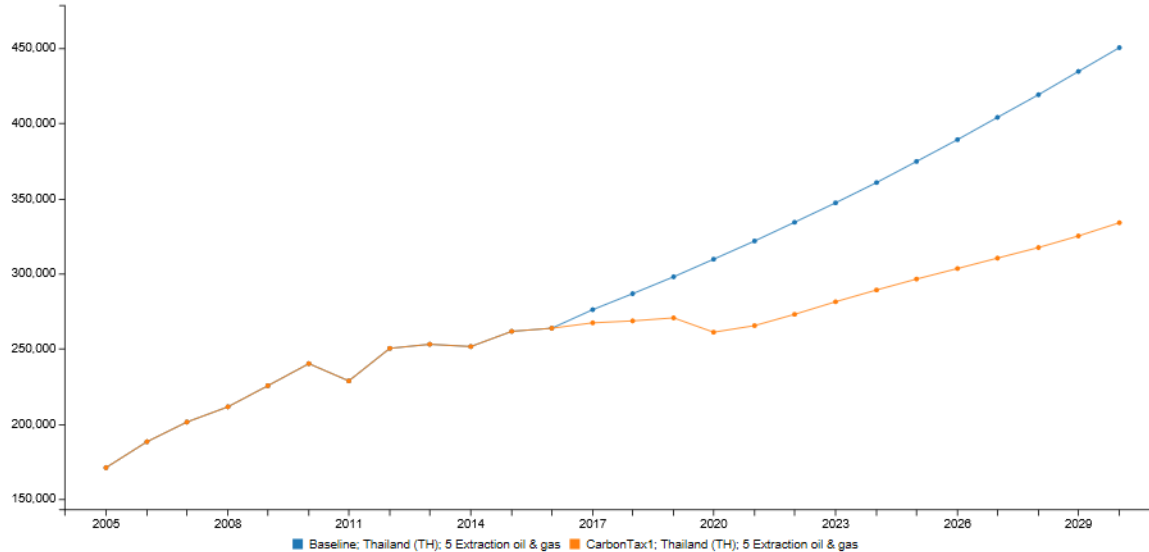
- Model results can be found in the Model Results tab
- Select file(s) to display



The screenshot displays the E3ME-Thai model interface. The top navigation bar includes tabs for 'E3ME-Thai', 'Introduction', 'Instructions', 'Scenarios', 'Assumptions', 'Variables', 'Running the model', and 'Model results'. The 'Model results' tab is highlighted with a red circle. Below the navigation bar, a list of files is shown: 'Baseline.mre (1.44MB)' and 'CarbonTax1.mre (1.44MB)'. This list is also circled in red. To the right of the file list, the 'Scenarios Selected' section lists 'Baseline.mre' and 'CarbonTax1.mre'. At the bottom left of the interface, there is a button labeled 'Enable frontend'.

Step 4: Display results (cont)

QR - output of products at basic prices (m Baht(2010 price))



Scenario Settings Variable Selection Chart Settings [Reload data](#) [Download as CSV](#)

Variable

QR - output of products at basic prices (m B)

Transformation

- Levels
- Year over year growth
- Absolute differences from baseline
- Relative differences from baseline
- Show table of data

Dimension 1

- All dimensions
- Thailand (TH)

Sum these

Dimension 2

- All sectors
- 1 Agriculture
- 2 Forestry and logging
- 3 Fishing & aquaculture
- 4 Mining coal & lignite
- 5 Extraction oil & gas
- 6 Mining of metal ores
- 7 Other mining

Sum these

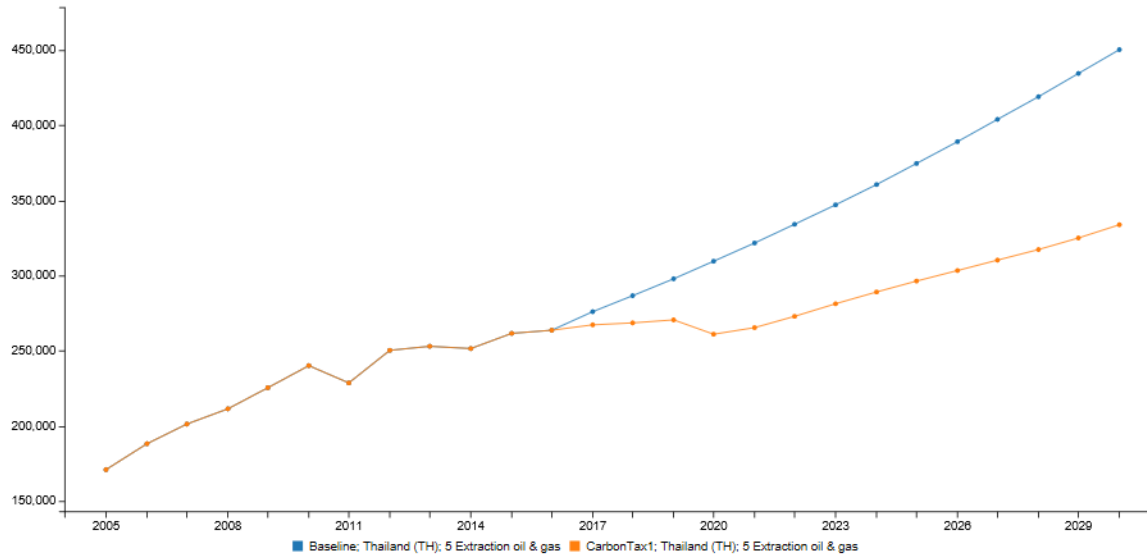
time	Baseline; Thailand (TH); 5 Extraction oil & gas	CarbonTax1; Thailand (TH); 5 Extraction oil & gas
2005	170878.406	170878.406
2006	188142.375	188142.375
2007	201242.188	201242.188
2008	211261.350	211261.350

Step 4: Display results (cont)

- Inspect one file: variables & sectors
- Comparison between files: scenarios vs baseline
 - choose any baseline to compare with
 - inspect results by variables and sectors
 - sum across dimensions
 - level, absolute & percentage differences from baseline
- Option to export to .csv

Step 5: Extract model results (optional)

QR - output of products at basic prices (m Baht(2010 price))



Scenario Settings Variable Selection Chart Settings [Reload data](#) [Download as CSV](#)

Variable: QR - output of products at basic prices (m B)

Transformation: Levels Year over year growth Absolute differences from baseline Relative differences from baseline Show table of data

Dimension 1: All dimensions, Thailand (TH)

Dimension 2: All sectors, 1 Agriculture, 2 Forestry and logging, 3 Fishing & aquaculture, 4 Mining coal & lignite, 5 Extraction oil & gas, 6 Mining of metal ores, 7 Other mining

Sum these Sum these

time	Baseline; Thailand (TH); 5 Extraction oil & gas	CarbonTax1; Thailand (TH); 5 Extraction oil & gas
2005	170878.406	170878.406
2006	188142.375	188142.375
2007	201242.188	201242.188
2008	211261.350	211261.350

Step 5: Extract model results (cont)

The screenshot shows an Excel spreadsheet with the following data:

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	
time																										
Baseline; Thailand (TH); 5 Extraction oil & gas	170878.4	188142.4	201242.2	211361.4	225408	240110.3	228617.5	250288.6	252996.7	251469	261596	263670.3	276021.4	286666.6	297895.7	309602	321716.6	334192.8	347113.2	360616.1	374649.9	389172.4	403999.4	419061.4	434557	
CarbonTax1; Thailand (TH); 5 Extraction oil & gas	170878.4	188142.4	201242.2	211361.4	225408	240110.3	228617.5	250288.6	252996.7	251469	261596	263670.3	267260.6	268562.5	270556.9	261024.2	265404.4	272914.5	281287.6	289129.8	296386.2	303402.3	310331.4	317361.6	325063	

Options to run the model

Option 1: Manager

- basic users
- Windows interface
- user-friendly edit input options
- run model through option in model Manager
- visualisation tools for model results

Option 2: Command Prompt

- intermediate/advanced users
- edit input files in text editor
- run model through Command Prompt
- results in text file format

Option 3: automated runs

- advanced users
- additional software such as Ox or MATLAB to automatically change inputs and run the model repeatedly
- example Target Run software provided
- results in text files & can be read in automatically for further analysis