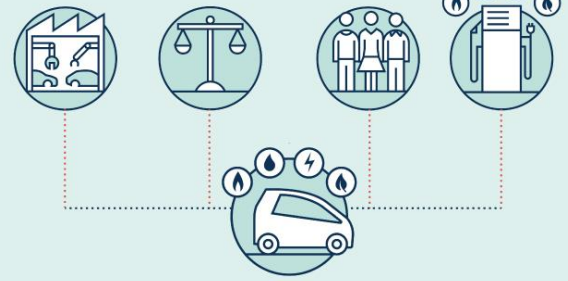




Powertrain Technology Transition Market Agent Model



PTTMAM User Manual*

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*Version 1 (October 2018) prepared by J. Gómez Vilchez (JRC-Ispra). The views expressed are purely those of the author and may not in any circumstances be regarded as stating an official position of the European Commission.

1. Introduction

Since the use of PTTMAM requires a Vensim® DSS license, we assume some familiarity with the system dynamics modelling approach (SDS, 2018). An introduction to the field can be found online in Radzicki and Taylor (1997) and Pruyt (2013). For details on the software, see Vensim (2017). A technical description of PTTMAM is available in Harrison *et al.* (2016).

2. The PTTMAM folder

The PTTMAM folder you have received includes the following 13 files:

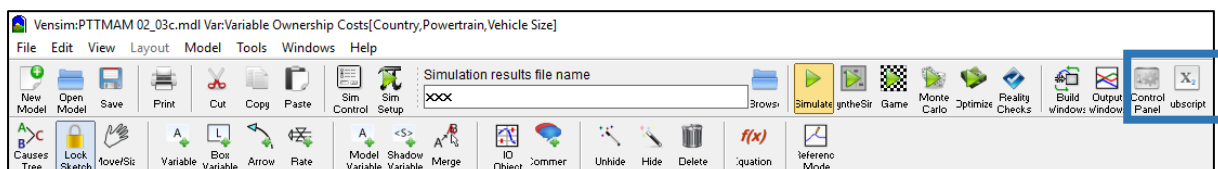
Name	Date modified	Type	Size
Base 02_03c.vdf	10/08/2016 15:42	VDF File	80,678 KB
Baseline 02_03c	19/10/2018 16:41	Microsoft Excel 97...	1,652 KB
Calibration Information 02_03.vdf	01/12/2015 15:26	VDF File	225 KB
Combined Calibration 02_02	21/11/2014 16:51	OUT File	3 KB
Combined Financial Calibration 02_02f+	10/08/2016 15:22	OUT File	4 KB
LCV Combined Calibration 02_02	21/11/2014 15:32	OUT File	3 KB
Production calibration 02_02	21/11/2014 13:21	OUT File	2 KB
PTTMAM 02_03c.2mdl	19/10/2018 17:05	2MDL File	860 KB
PTTMAM 02_03c	23/10/2018 15:58	Vensim model (M...	860 KB
Scrappage Scheme Calibration 02_02	24/11/2014 10:36	OUT File	2 KB
Subsidies 02_03c	10/08/2016 12:06	Microsoft Excel 97...	583 KB
Vehicle Demand Calibration 02_03c	04/12/2015 09:40	OUT File	9 KB
Vehicles by Type Calibration ALL 02_02	28/11/2014 09:43	OUT File	63 KB

The file '**PTTMAM 02_03c**' contains the model. Keep all the files in the same folder when you run PTTMAM.

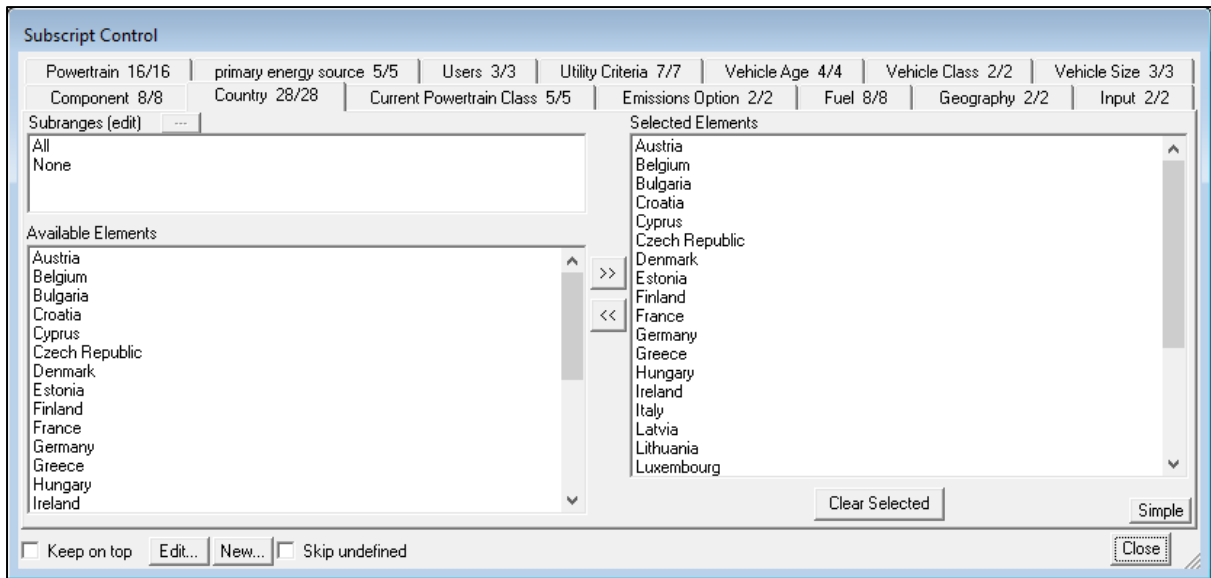
3. Overview of PTTMAM in Vensim®

Familiarise yourself with PTTMAM by:

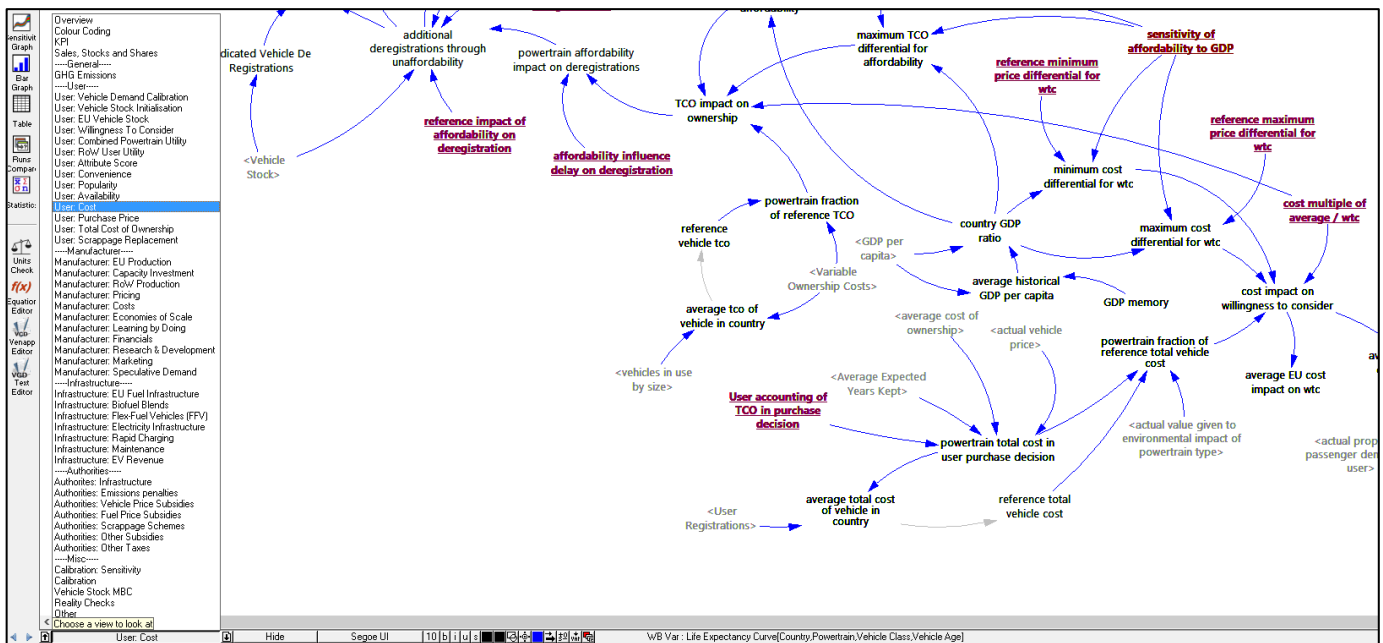
1. Double-clicking on '**PTTMAM 02_03c**'. By default, the simulation run named 'Base 02_03c' is loaded (you may check this by clicking on the Control Panel, under 'Datasets');



2. Viewing the model subscripents in the 'Subscript Control' box;



3. Examining the different views of the model, available at the bottom-left of the screen;

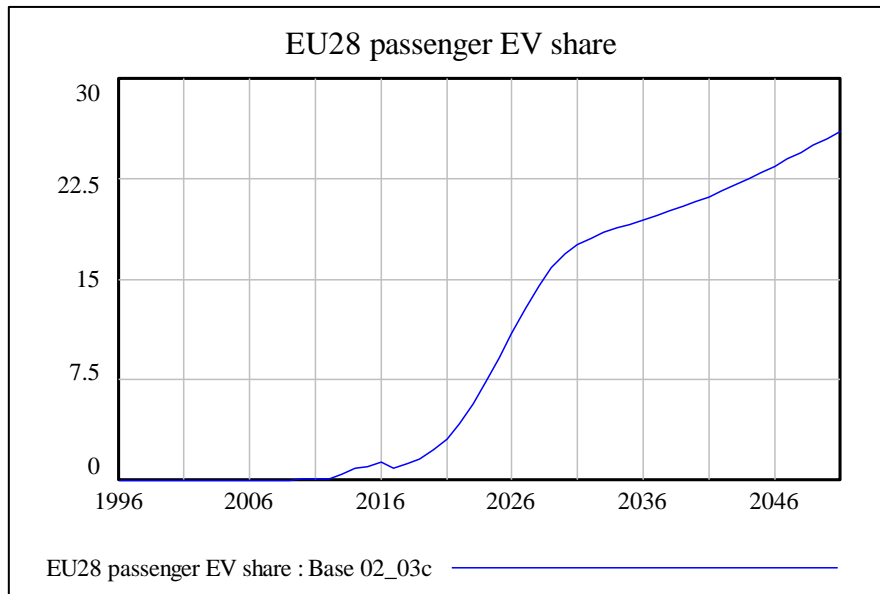


4. Exploring the Base run in PTTMAM

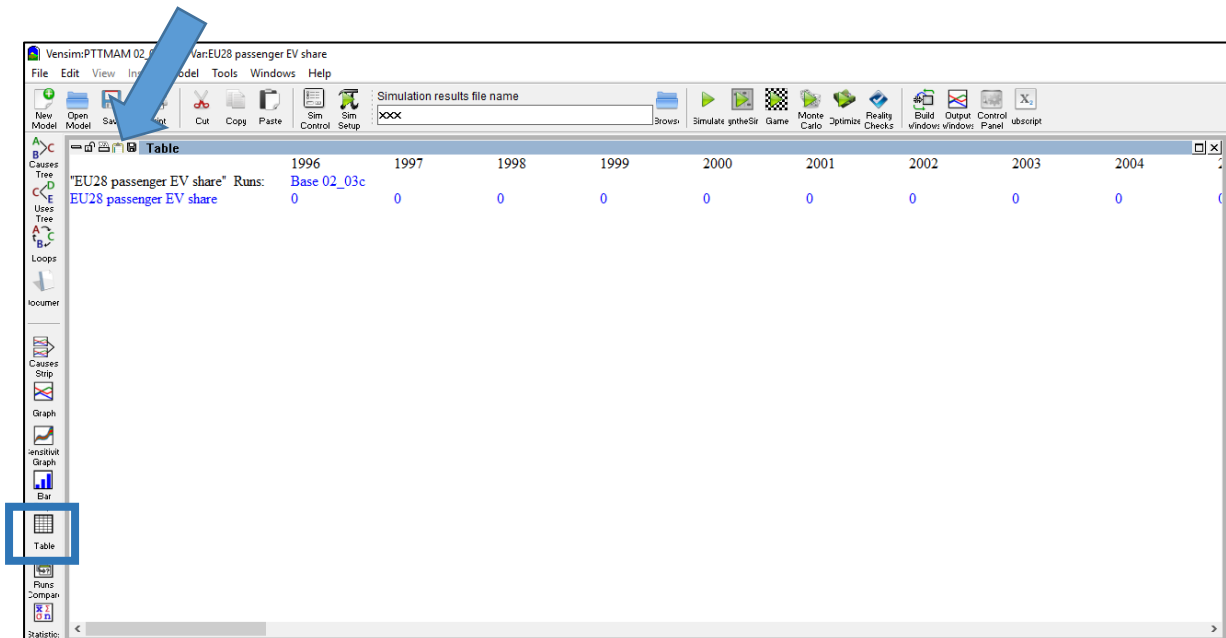
To see the model results under the Base run ('Base 02_03c'):

1. Go to the view named 'Sales, Stocks and Shares';
2. Select the variable 'EU28 passenger EV share' (a fast way of finding any variable is via Vensim®'s search function by pressing **Ctrl+F** and typing the variable name);

3. If you click on the 'Graph' button, you should see the following results.



4. Alternatively, you may see the numerical values by clicking on 'Table'. From here, you have the possibility to export the results to Microsoft Excel®. To do this, click on the icon 'export window contents' (blue arrow in the figure below) and then paste in Excel®;



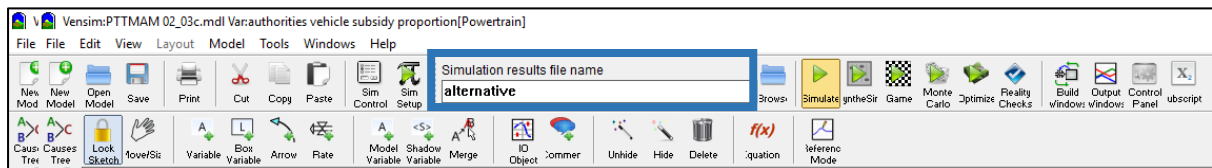
5. How to create alternative scenarios in PTTMAM

You may create alternative scenarios as follows:

1. In the PTTMAM folder, open the Excel® file 'Subsidies 02_03c';
2. In the tab 'Multiple States', introduce vehicle subsidies for PHEVs, BEVs and FCVs† (e.g. type in a value of 50% for the years 2019 and 2020);

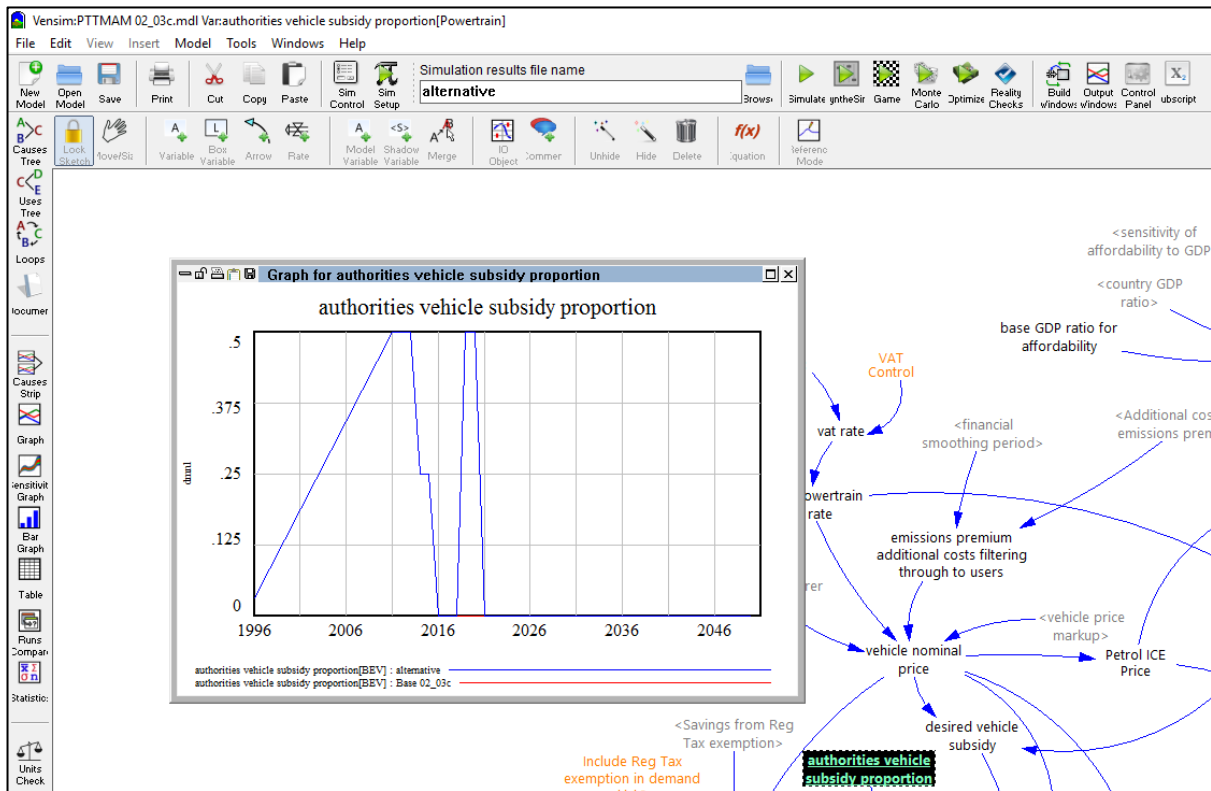
authorities vehicle subsidy proportion												
Authorities proportional subsidy of powertrain (proportion of price differential between powertrain and conventional powertrain)												
	1995	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Diesel ICEV	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
LPG ICEV	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
CNG ICEV	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Biodiesel ICEV	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Bioethanol ICEV	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Petrol HEV	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Diesel HEV	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Biodiesel HEV	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Bioethanol HEV	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Petrol PHEV	€ -	50%	50%	50%	25%	25%	0%	0%	0%	50%	50%	0%
Diesel PHEV	€ -	50%	50%	50%	25%	25%	0%	0%	0%	50%	50%	0%
Biodiesel PHEV	€ -	50%	50%	50%	25%	25%	0%	0%	0%	50%	50%	0%
Bioethanol PHEV	€ -	50%	50%	50%	25%	25%	0%	0%	0%	50%	50%	0%
BEV	€ -	50%	50%	50%	25%	25%	0%	0%	0%	50%	50%	0%
FCV	€ -	50%	50%	50%	25%	25%	0%	0%	0%	50%	50%	0%

3. Back in Vensim®, rename the scenario (e.g. 'alternative') and press 'Simulate' to run it;

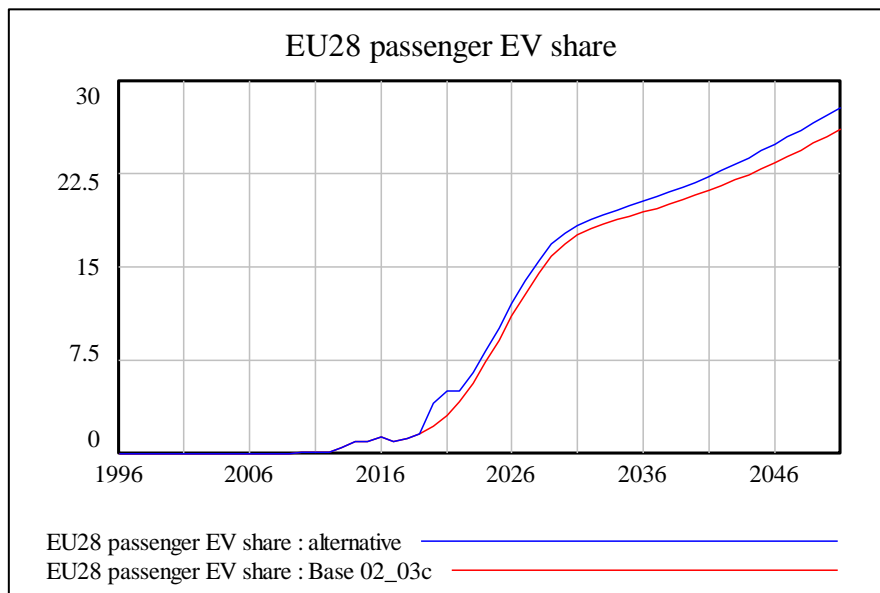


4. While the simulation is running (runtime depends on your computer, but usually takes less than one minute), the two Excel® files ('Baseline 02_03c' and 'Subsidies 02_03c') will automatically open. If you check your PTTMAM folder now, you will find that a new file named 'alternative.vdf' has been created. This new run is also automatically generated as a dataset in Vensim®'s Control Panel;
5. You may now close the window showing 'Warning' messages;
6. In the aforementioned 'Subscript Control' box, select only the following powertrain: BEV;
7. Visualise the variable 'authorities vehicle subsidy proportion' (which is located in the view 'Authorities: Vehicle Price Subsidies'; again you may prefer to use Vensim®'s search function). The difference between the 'Base 02_03c' (red line) and the 'alternative' (blue line) runs can be seen below;

† Plug-in hybrid electric vehicle (PHEV), battery electric vehicle (BEV) and fuel cell vehicle (FCV).



8. Visualise again the variable 'EU28 passenger EV share'. You should see the following results for both scenarios;



Feel free to build upon this simple example and run your own scenarios.
Do not forget to acknowledge the source of your work and kindly send us a copy:
JRC-PTTMAM@ec.europa.eu

References

Harrison, G., Thiel, C., Jones, L. (2016) *Powertrain Technology Transition Market Agent Model – An introduction*. JRC Technical Report. Joint Research Centre (JRC). Available at: http://publications.jrc.ec.europa.eu/repository/bitstream/JRC100418/pttmam%20technical%20report%20final_online.pdf

Pruyt, E. (2013) *Small System Dynamics Models for BIG Issues*. Available at: <http://simulation.tbm.tudelft.nl/smallSDmodels/Intro.html>

Radzicki, M.J. and Taylor, R.A. (1997) *Introduction to System Dynamics - A Systems Approach to Understanding Complex Policy Issues*. U.S. Department of Energy. Available at: <http://lm.systemdynamics.org/DL-IntroSysDyn/inside.htm>

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