



Policy making and scenario evaluation tool
for road transport emissions

Presentation Outline

PART II

- Software demonstration
 - Scenario building options
- Examples – Energy, fuels, pollutants
 - Scenario building approach
 - Test cases



SCENARIO BUILDING



TEST CASE #1



Test case #1: Biofuels

➤ Scenario description:

- **Policy:** setting a target for the share of energy to be produced from advanced biofuels as a percentage of the energy derived from renewable sources in all forms of transport by 2020
- **Example:** energy problem will be addressed through multi-technological strategies. Biofuels can be a part of an overall solution
- **Implementation:** increase the use of bioethanol or biodiesel for certain time range expecting a drop in overall CO2 emissions
- **Details:** decide how the percentage increase of biofuels will be performed

Test case #1: Biofuels

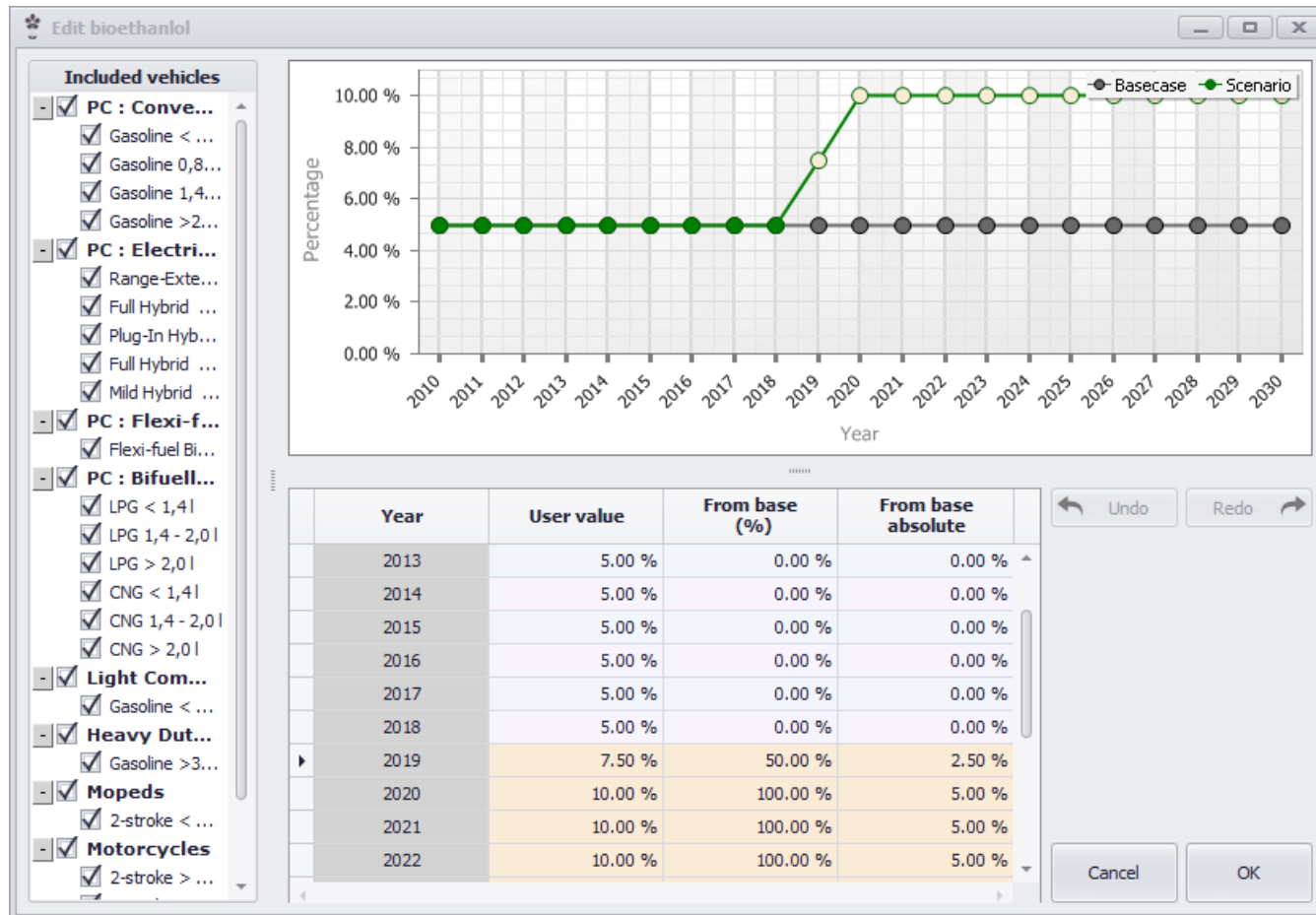
➤ Default procedure:

- The user enters a usage percentage of bioethanol and biodiesel different than the baseline for a set time range and vehicles of choice
- No further adjustments are carried out



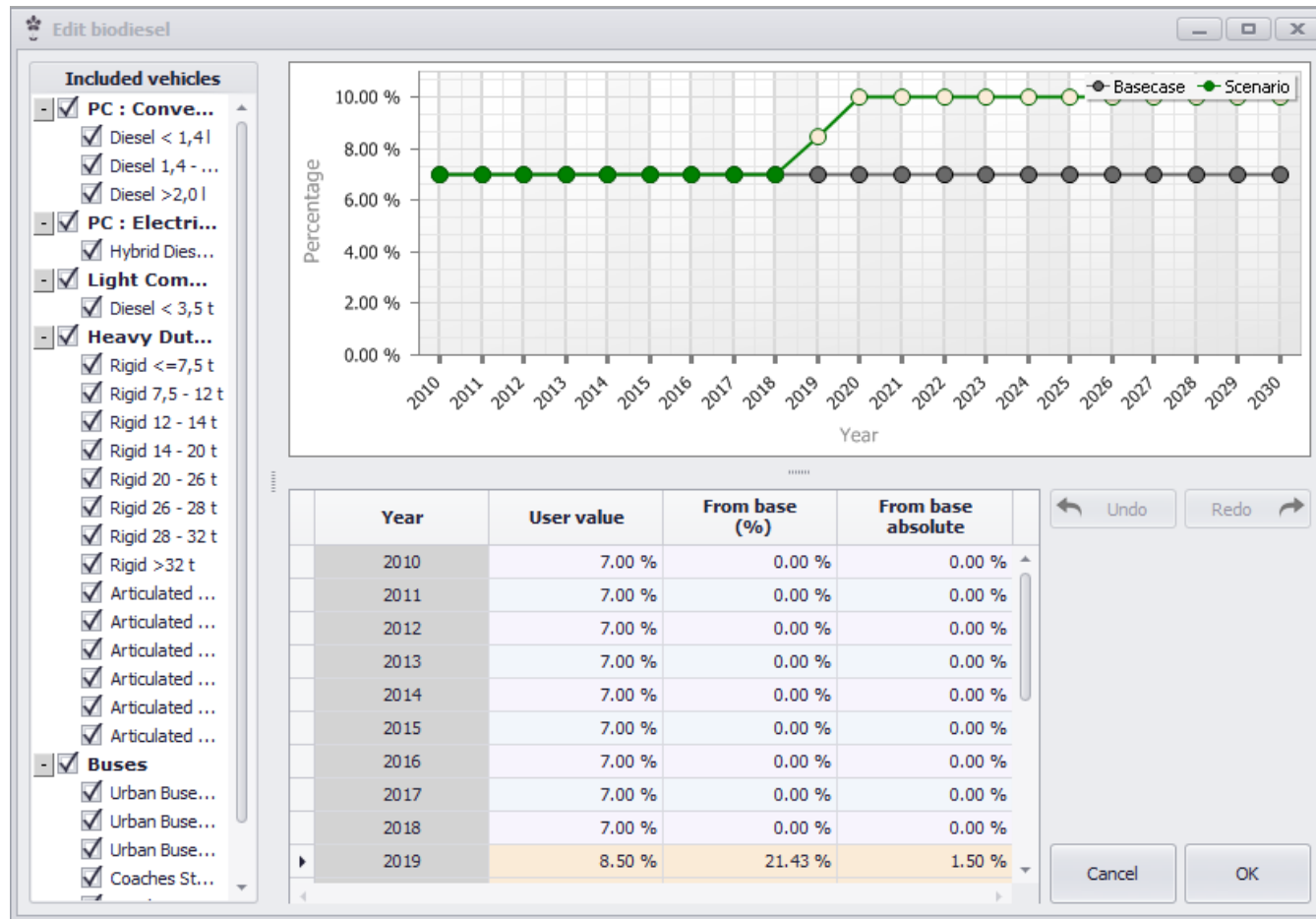
Test case #1: Biofuels

Input:



Test case #1: Biofuels

Input:



Test case #1: Biofuels

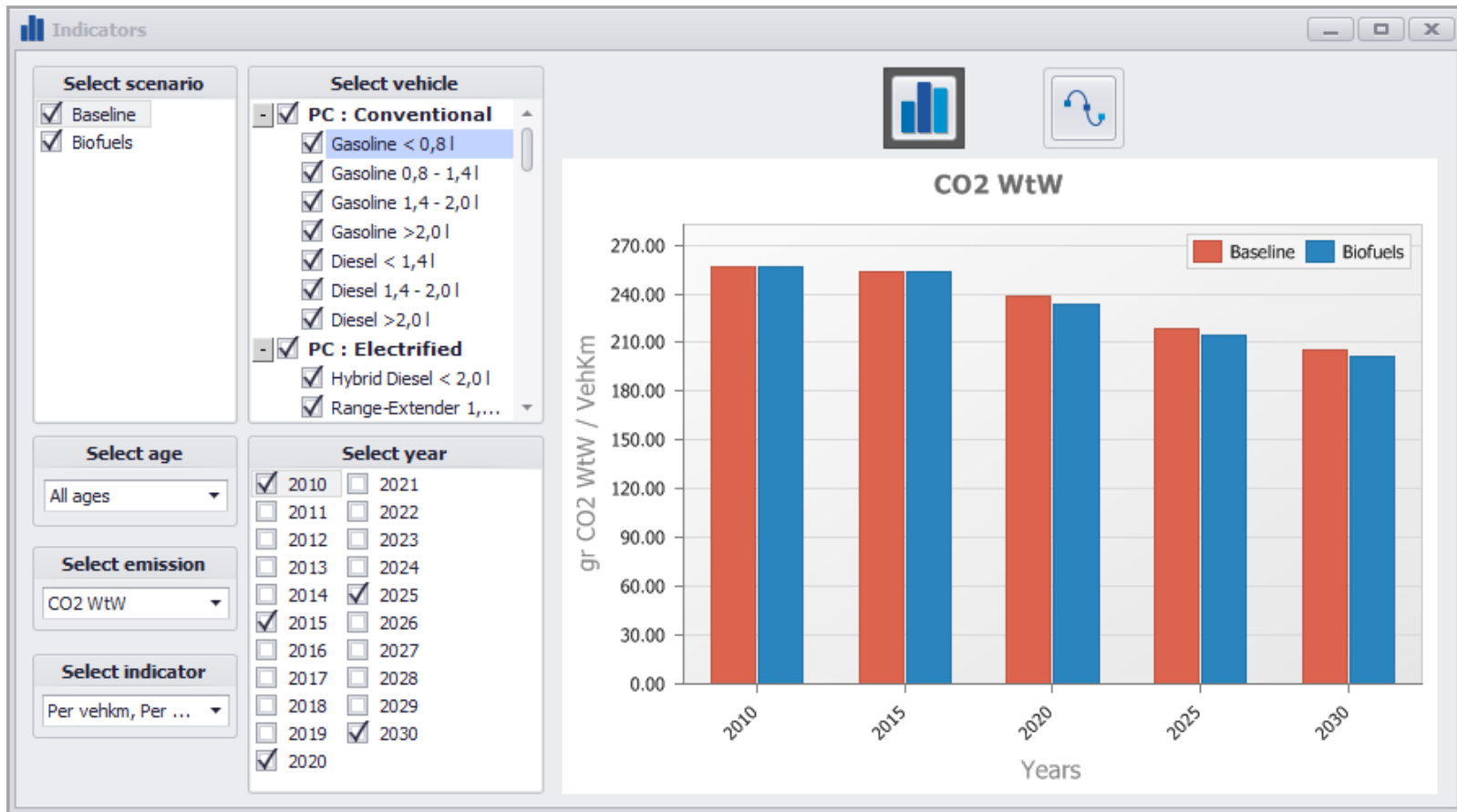
➤ Default response :

- Energy consumption is rearranged according to the new shares of fuels
- Biofuels CO2 emissions will increase due to the higher share holding, but the overall CO2 emissions will be reduced.



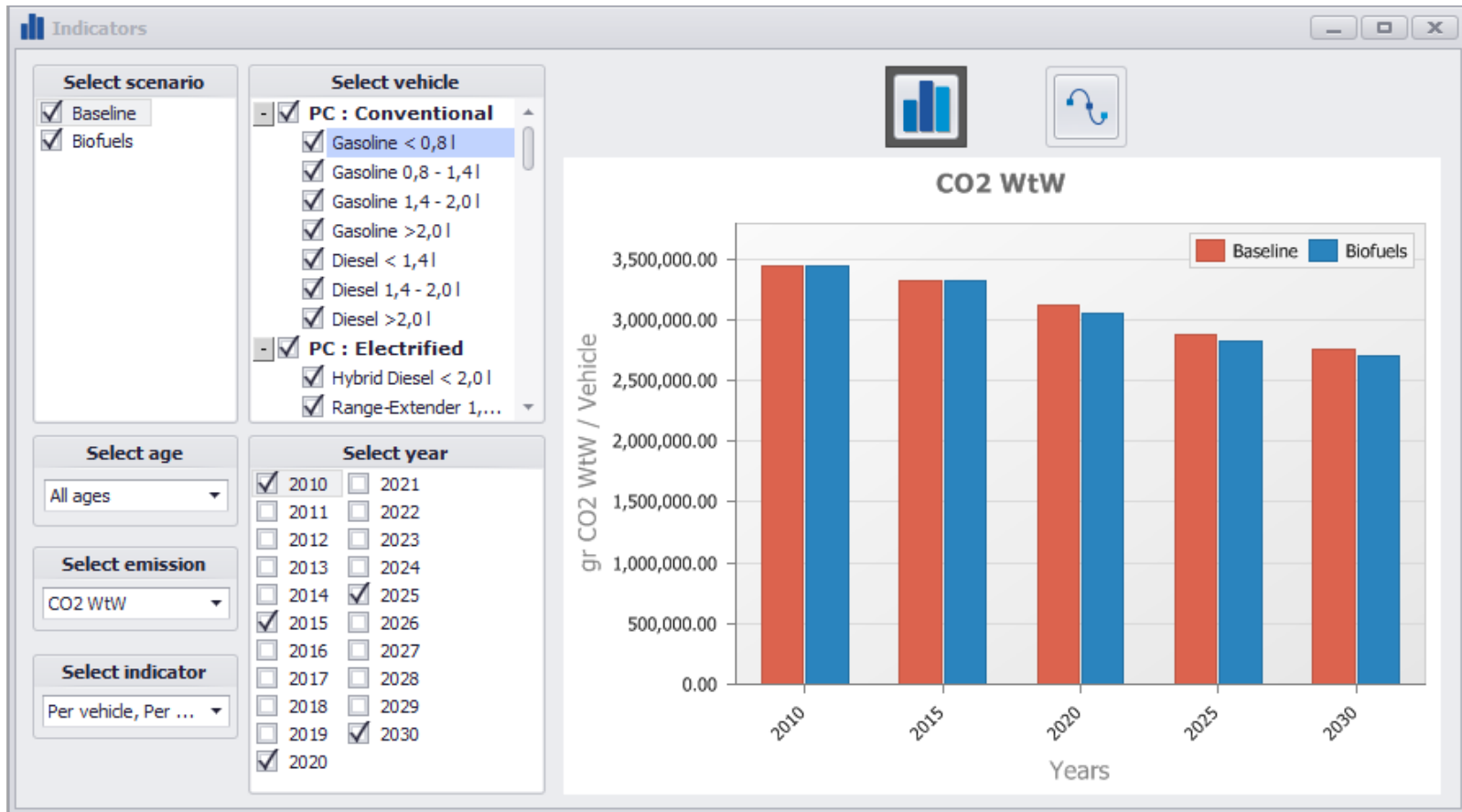
Test case #1: Biofuels

Results:



Test case #1: Biofuels

Results:



Test case #1: Biofuels

Results:



TEST CASE #2



Test case #2: Pollutants

➤ Scenario description:

- **Policy:** The effort to maintain and improve air quality by setting acceptable limits for exhaust emissions according to the technology classification of the vehicles
- **Example:** The integration of Euro 6 vehicles at the fleet will reduce NO_x and PM emissions
- **Implementation:** Redefine the percentages held by the technological classes per year in order to observe the effects on pollutants
- **Details:** specify the share of vehicles technology annually

Test case #2: Pollutants

► Input:

Edit COPERT technology matrix

	2013	2014	2015	2016	2017	2018	2019	2020
Conventional								
PC Euro 1 - 91/441/EEC								
PC Euro 2 - 94/12/EEC	8.0 %	7.0 %						
PC Euro 3 - 98/69/EC Stage2000	15.0 %	15.0 %	8.0 %	3.0 %	2.0 %	2.0 %	2.0 %	2.0 %
PC Euro 4 - 98/69/EC Stage2005	35.0 %	34.0 %	14.0 %	15.0 %	13.0 %	13.0 %	12.0 %	8.0 %
PC Euro 5 - EC 715/2007	42.0 %	44.0 %	32.0 %	32.0 %	20.0 %	20.0 %	20.0 %	15.0 %
PC Euro 6 - EC 715/2007			46.0 %	50.0 %	27.0 %	27.0 %	14.0 %	10.0 %
PC Euro 6c					38.0 %	38.0 %	52.0 %	65.0 %
Total	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %

Select vehicle

- PC : Conventi...
 - Gasoline < 0,8l
 - Gasoline 0,8 - 1...
 - Gasoline 1,4 - 2...
 - Gasoline >2,0l
 - Diesel < 1,4l
 - Diesel 1,4 - 2,0l
 - Diesel >2,0l
- PC : Electrified
 - Hybrid Diesel <...
 - Range-Extende...
 - Full Hybrid 1,4 ...
 - Plug-In Hybrid ...
 - Full Hybrid > 2...
 - Mild Hybrid 1,4...
 - Battery Electric...
 - Fuel Cell Electri...
- PC : Flexi-fue...
- PC : Bifuelled ...
 - LPG < 1,4l
 - LPG 1,4 - 2,0l
 - LPG > 2,0l
 - CNG < 1,4l
 - CNG 1,4 - 2,0l
 - CNG > 2,0l
- Light Commer...
 - Gasoline < 3,5t

Discard changes

- For current vehicle
- For all vehicles

Default values

- For current vehicle
- For all vehicles

Cancel

OK

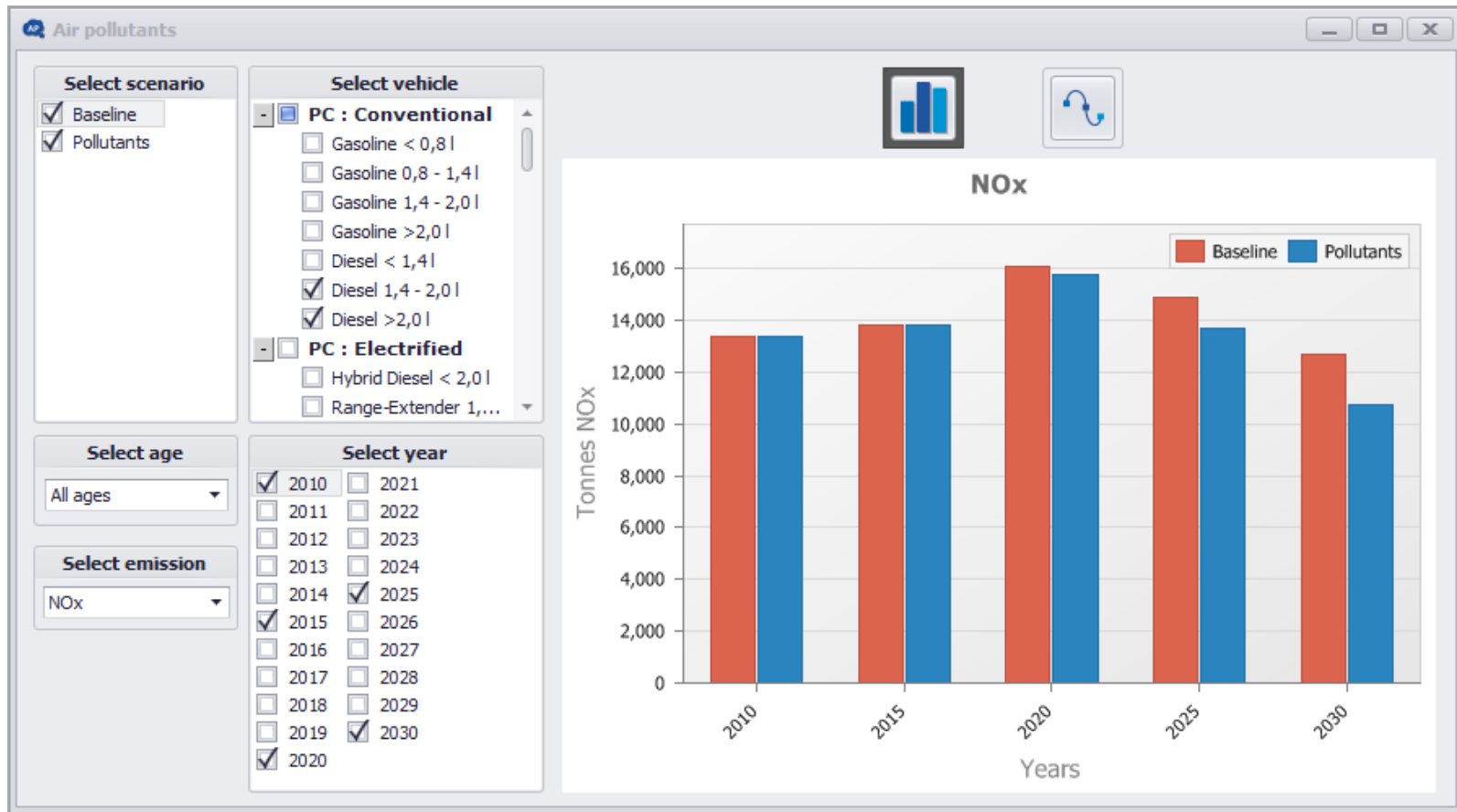
Test case #2: Pollutants

➤ Default response :

- SIBYL will make the executions considering the new technology matrix table
- NO_x and PM emissions will be reduced as latest technology vehicles took the place of older vehicles

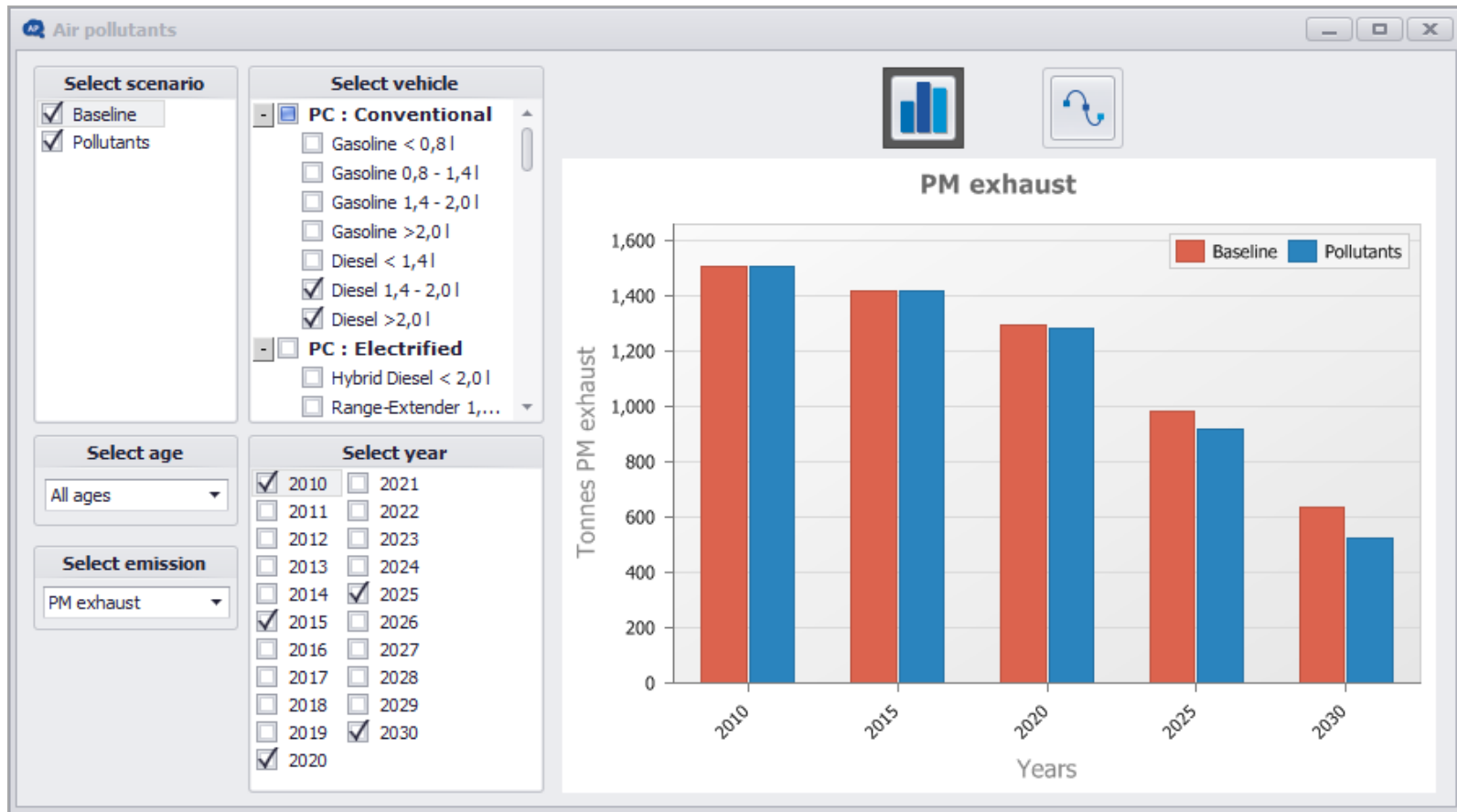
Test case #2: Pollutants

► Results:



Test case #2: Pollutants

► Results:



Test case #2: Pollutants

➤ Extreme case

- Assumption that from 2016 onwards 100% of the vehicle fleet will belong to the Euro 6c class
- The same procedure is performed as previously



Test case #2: Pollutants

► Input:

Edit COPERT technology matrix

Select vehicle	2013	2014	2015	2016	2017	2018	2019	2020
Conventional								
PC Euro 1 - 91/441/EEC								
PC Euro 2 - 94/12/EEC	8.0 %	7.0 %						
PC Euro 3 - 98/69/EC Stage2000	15.0 %	15.0 %	8.0 %					
PC Euro 4 - 98/69/EC Stage2005	35.0 %	34.0 %	14.0 %					
PC Euro 5 - EC 715/2007	42.0 %	44.0 %	32.0 %					
PC Euro 6 - EC 715/2007			46.0 %					
PC Euro 6c				100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
Total	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %

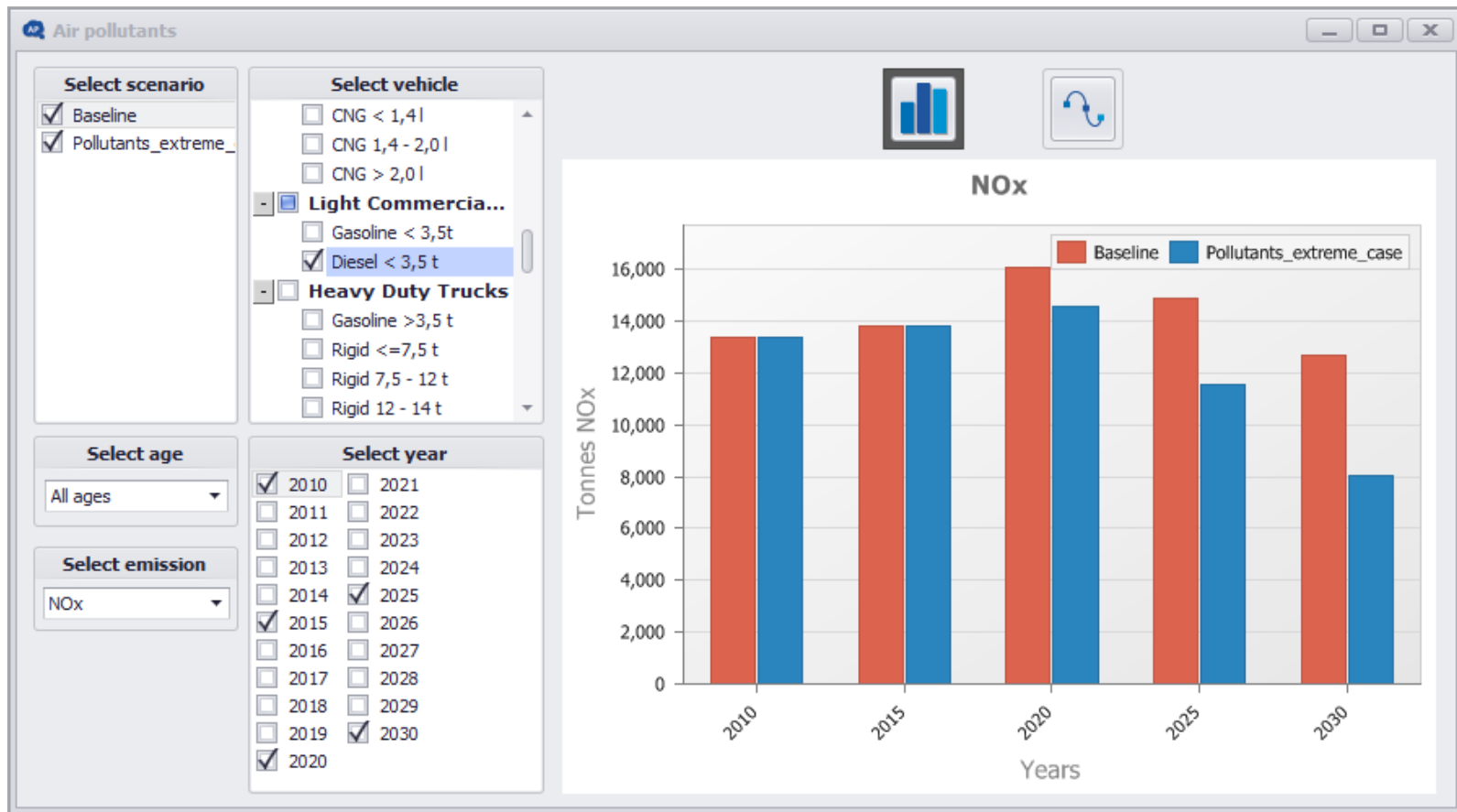
Select vehicle

- PC : Conventi...
 - Gasoline < 0,8l
 - Gasoline 0,8 - 1...
 - Gasoline 1,4 - 2...
 - Gasoline >2,0l
 - Diesel < 1,4l
 - Diesel 1,4 - 2,0l
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 - Full Hybrid 1,4 ...
 - Plug-In Hybrid ...
 - Full Hybrid > 2...
 - Mild Hybrid 1,4...
 - Battery Electric...
 - Fuel Cell Electri...
- PC : Flexi-fue...
 - Flexi-fuel Bioet...
- PC : Bifuelled ...
 - LPG < 1,4l
 - LPG 1,4 - 2,0l
 - LPG > 2,0l
 - CNG < 1,4l
 - CNG 1,4 - 2,0l
 - CNG > 2,0l
- Light Commer...
 - Gasoline < 3,5t

Buttons: Discard changes (For current vehicle, For all vehicles), Default values (For current vehicle, For all vehicles), Cancel, OK

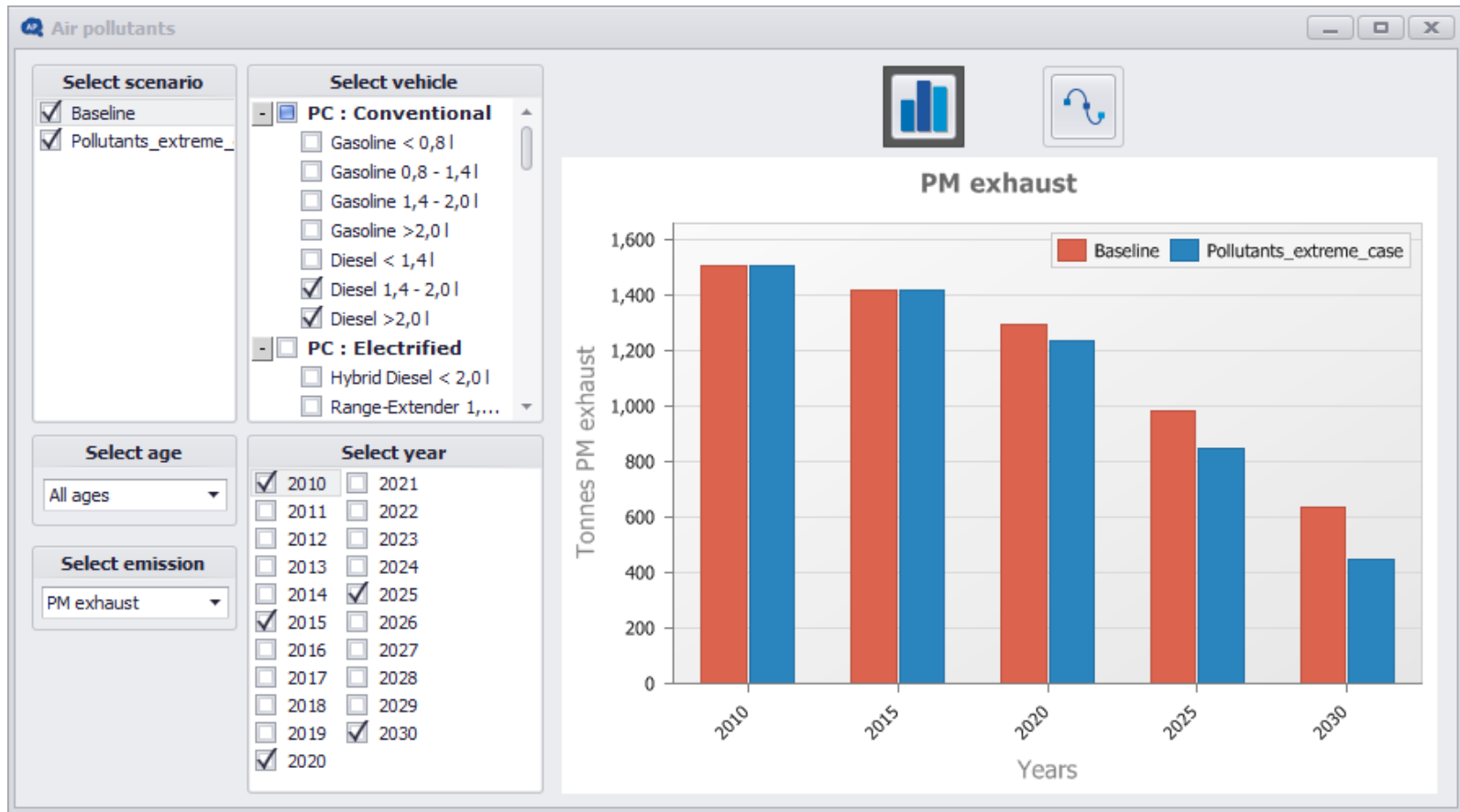
Test case #2: Pollutants

► Results:



Test case #2: Pollutants

Results:



TEST CASE #3

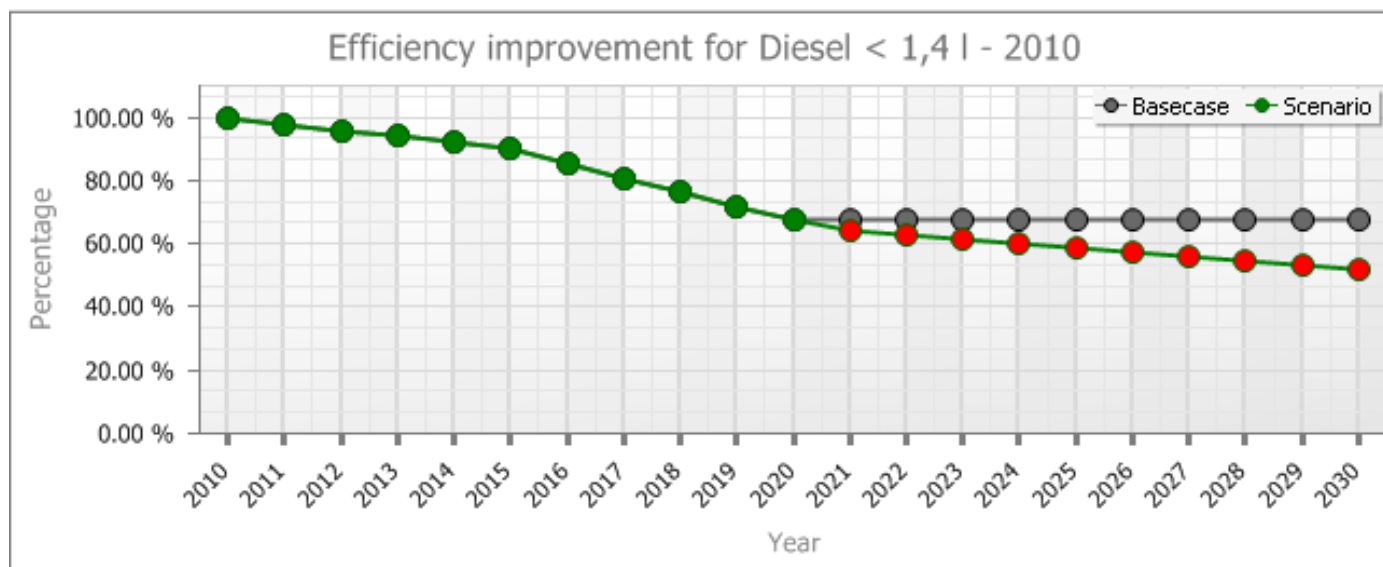


Test case #3: Efficiency Targets/TA

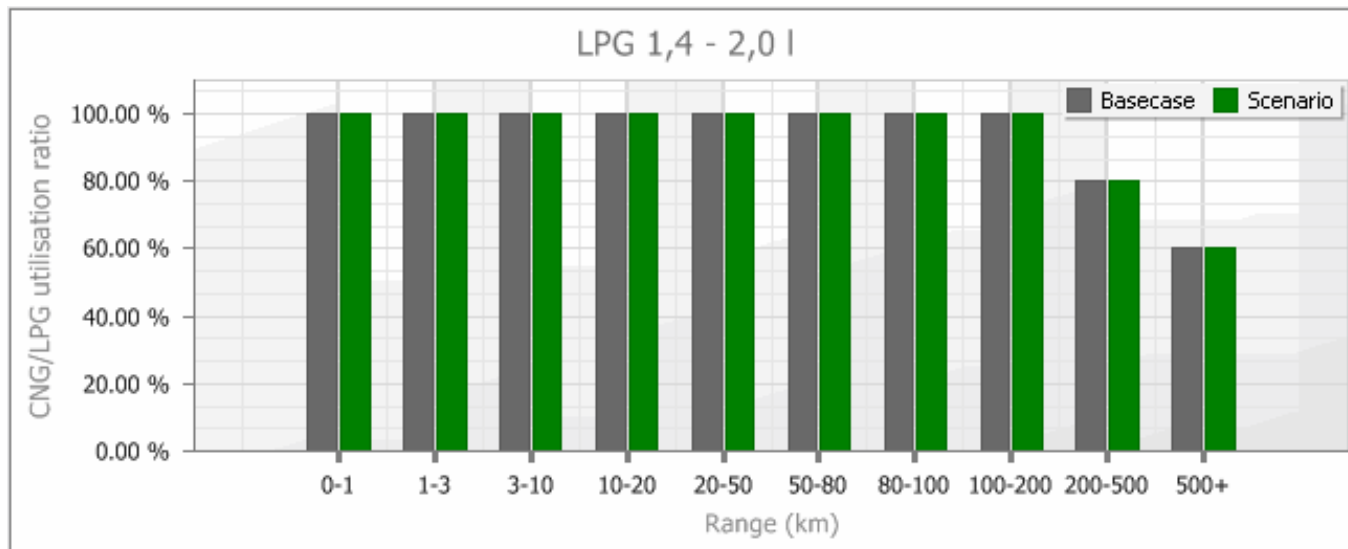
➤ Scenario description:

- **Policy:** Insert new type-approval limitations or analyse impacts of technological breakthroughs for selected vehicle technologies together with increased market penetration in order to represent quicker learning
- **Example:** regulations that set post-2020 CO₂ targets for passenger cars
- **Implementation:** Change efficiency improvement rates according to targets
- **Details:** decide how if this will affect the rest of the baseline (e.g. market trends) in terms of new registrations/stock etc.

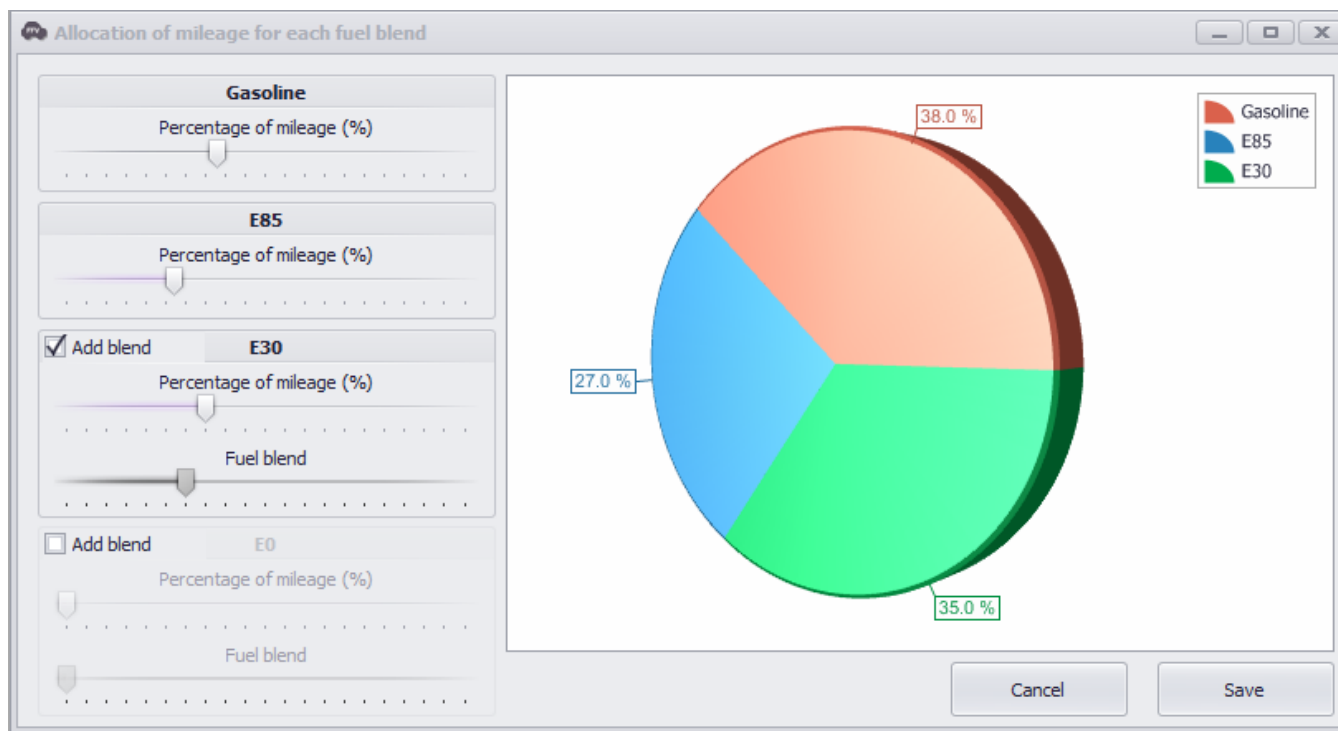
Test case #3: Efficiency Targets/TA



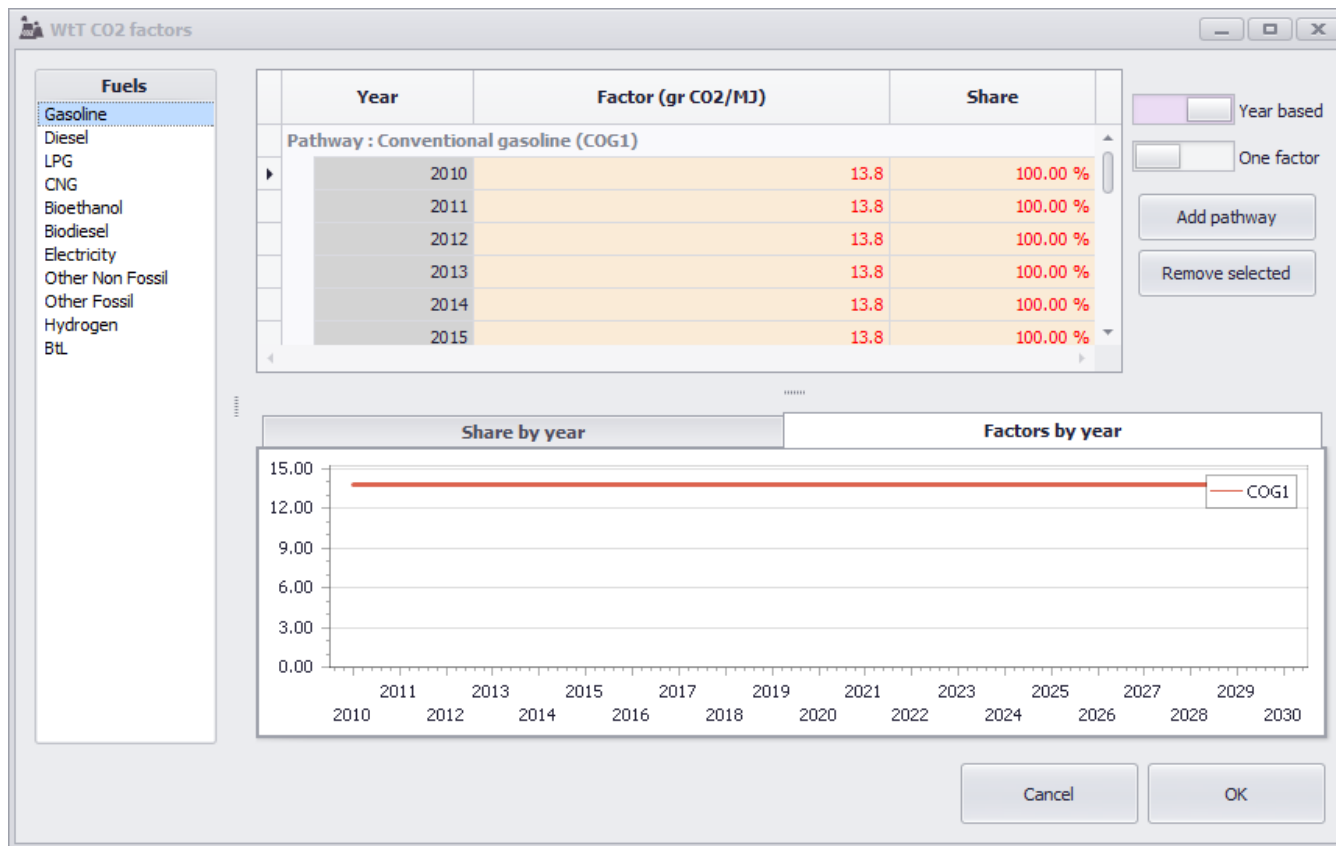
Test case #3: Efficiency Targets/TA



Test case #3: Efficiency Targets/TA



Test case #3: Efficiency Targets/TA



Test case #3: Efficiency Targets/TA

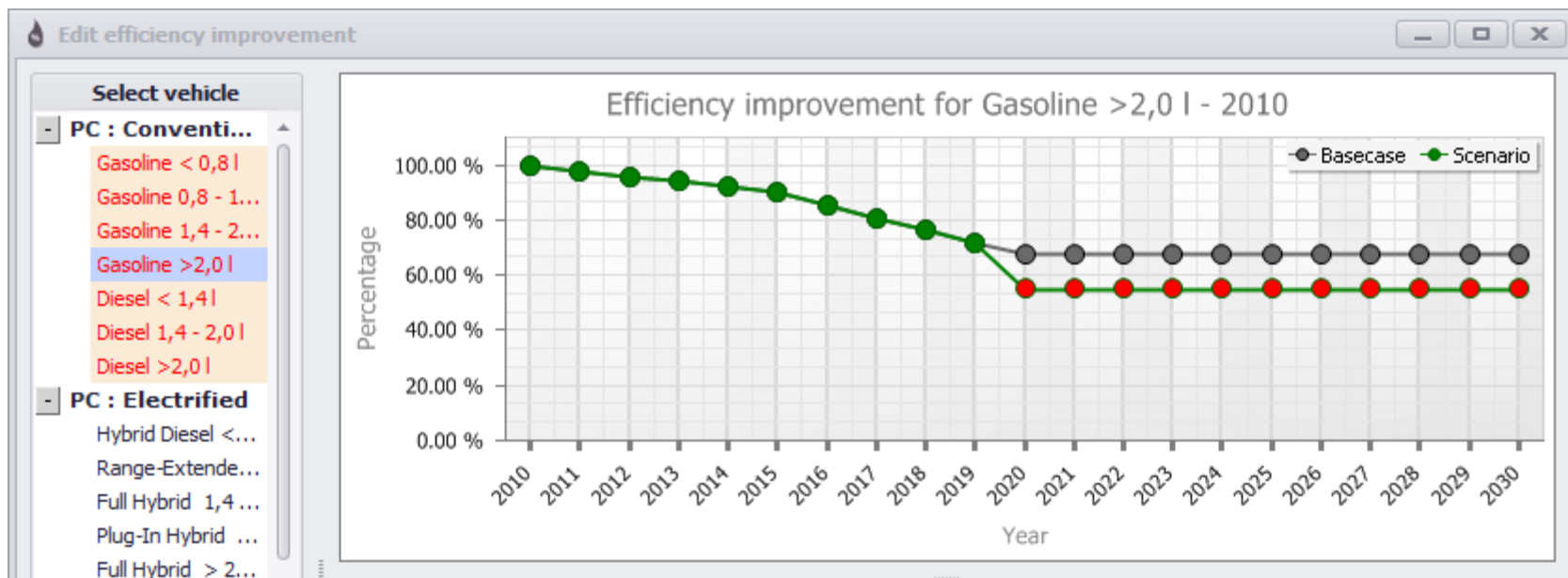
➤ Default procedure:

- The user must update the Efficiency improvement development curves
- Well-to-Tank energy and CO2 factors, LPG/CNG utilisation and FFV blends could also be affected
- No further adjustments are carried out



Test case #3: Efficiency Targets/TA

Input



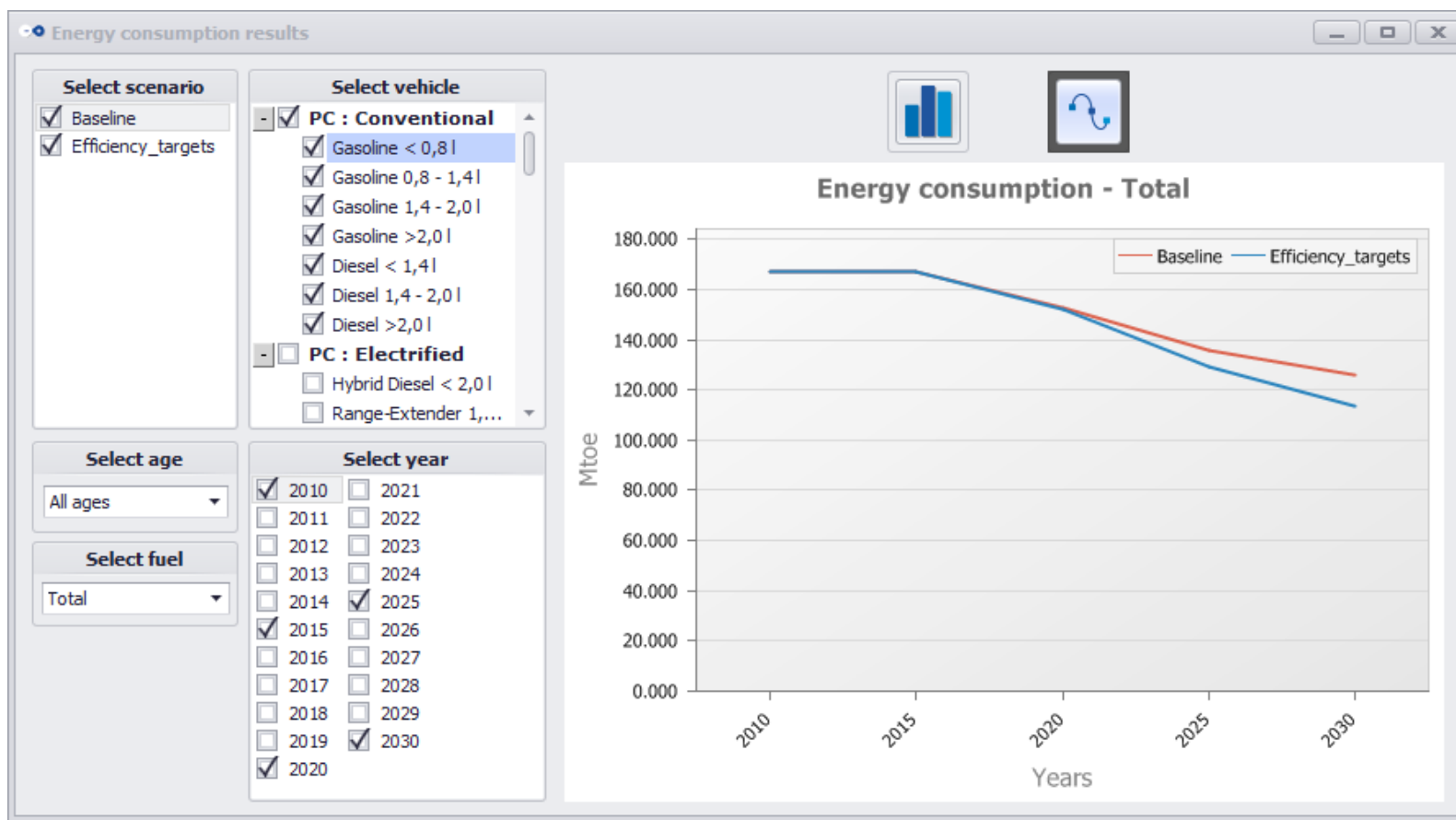
Test case #3: Efficiency Targets/TA

➤ Default response:

- Energy and emission factors will use the new efficiency improvement coefficients – this will directly affect energy and emission results for the selected vehicles
- The same scenario could be tested using type-approval factors

Test case #3: Efficiency Targets/TA

Results



Test case #3: Efficiency Targets/TA

➤ Modified procedure – Variation A:

- The same scenario could be tested using type-approval factors
- The user must correct the Efficiency improvement development curves
- No further adjustments are carried out



Test case #3: Efficiency Targets/TA

➤ Modified response – Variation A :

- Energy and emission factors will use the new type-approval factors – this will directly affect energy and emission results for the selected fuels
- Type-approval target can be validated by using SIBYL indicators



Test case #3: Efficiency Targets/TA

► Results – type approval

