User guide

AIRPOLIM-T

Air Pollution Impact Model for Transport

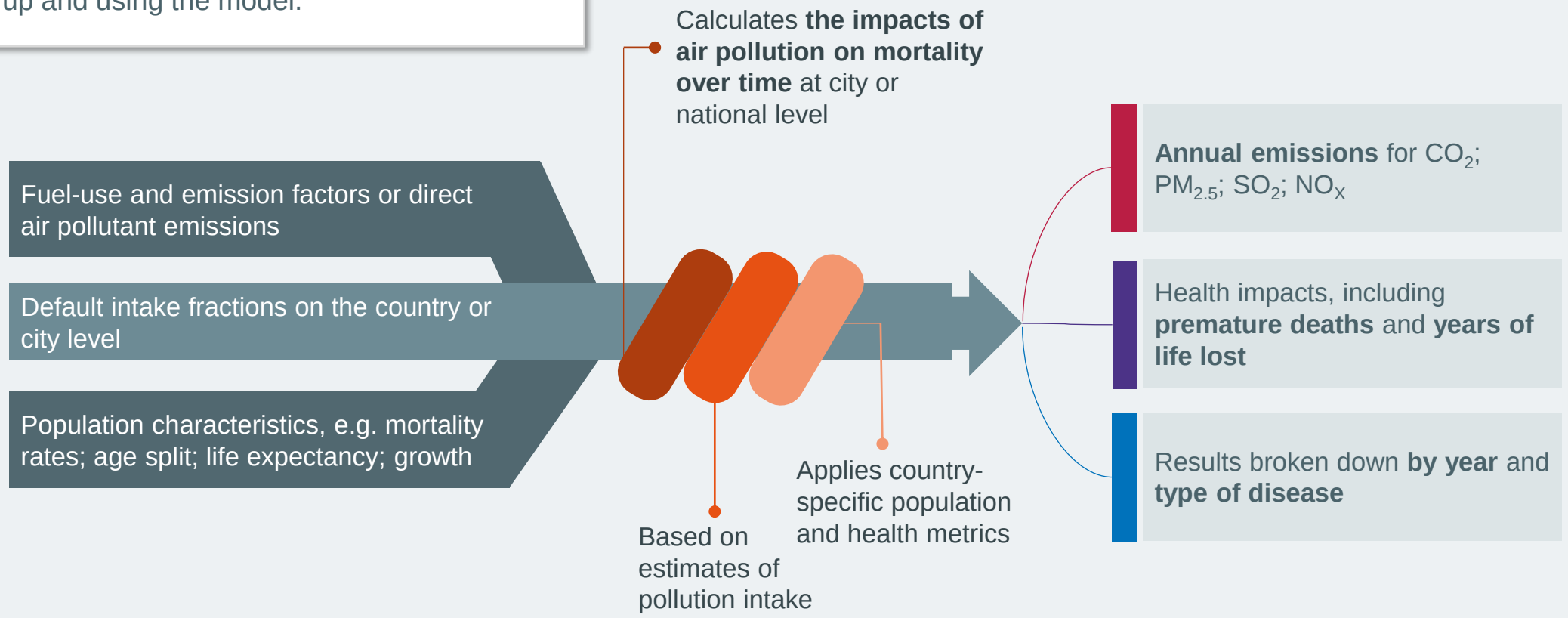
Supported by:
Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
based on a decision of the German Bundestag
INTERNATIONAL CLIMATE INITIATIVE (IKI)

Introducing AIRPOLIM-T

AIRPOLIM-T assesses the air quality health impacts of transport sector emissions.

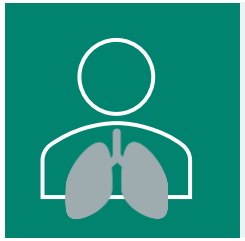
This document provides a step-by-step guide to setting up and using the model.

compass toolbox

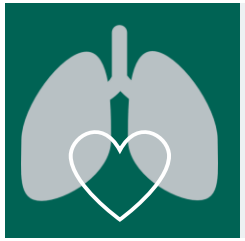


Air pollution health impacts: calculation steps

STEP 1
Estimate air pollutant emissions



STEP 2
Estimate the intake of air pollutants by the exposed population



STEP 3
Apply dose-response functions and country-specific, age-weighted mortality rates

STEP 4
Derive air pollution induced health impacts including premature deaths and years of life lost

Model overview

Purpose and features of the main sections of the model

INPUTS	Insert data for each scenario or country (e.g. fuel use, emissions, mortality rates or population growth).
CALCULATIONS	Quantification of air quality health impacts based on inputs for each scenario.
RESULTS	The dashboard gives an overview of the results for each scenario.
APPENDIX	Fixed inputs (including intake fractions, emission factors or concentration response functions).

IMPORTANT NOTE:
Yellow cells throughout the file are input cells where the user needs to include either text or data. Non-yellow shaded cells typically denote where formulas are used to perform calculations or link to other cells.

Opening the Excel file

The file opens on the cover sheet with information on the tool and an overview of sheets.

INPUTS > >

CALC > >

RESULTS > >

APPENDIX > >

NEW CLIMATE INSTITUTE | Ambition to Action | Supported by: Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, based on a decision of the German Bundestag | INTERNATIONAL CLIMATE INITIATIVE (IKI) | air polim-t

Overview

File Name:	NewClimate Air Pollution Impact Model for Transport Emissions (AIRPOLIM-T)
Version:	v1.0 (beta version)
Location:	The model is made available for download online at newclimate.org/resources/tools
Description:	Spreadsheet-based model to estimate the health impacts of air pollution from the transport sector on the city or country level A full description of the model is available online at newclimate.org/resources/tools
Instructions:	A user guide for the model is available online at newclimate.org/resources/tools
Info and useage rights:	This model was developed by NewClimate Institute under the Ambition to Action project, funded by the International Climate Initiative (IKI) The model is provided as an open source tool to support policy making in the transport sector Useage should appropriately reference NewClimate Institute, the name and version of the model as set out above The authors, NewClimate Institute, the Ambition to Action project and the funders (IKI) are in no way liable for any errors or omissions in the model, and nor
Contact:	Tessa Schiefer (t.schiefer@newclimate.org); Harry Fearnehough (h.fearnehough@newclimate.org) www.newclimate.org www.ambitiontoaction.net

Sheets

INPUTS >>
- ScenarioSetUp
- EmissionFactors
- FuelUse
- CalcEmissions
- DirectEmissions
- MortalityRates
- LifeExpectancy
- PopGrowthrate
- PopShareOver25

CALC >>
- ExposedPopTotal
- ExposedPop25
- IntakeFraction

Setting up the tool

Data inputs

INPUTS > >

CALC > >

RESULTS > >

APPENDIX > >

- ScenarioSetUp
- EmissionFactors
- FuelUse
- CalcEmissions
- DirectEmissions
- MortalityRates
- LifeExpectancy
- PopGrowthRate
- PopShareOver25

Scenario set up

Sources: User input

Do not enter values below 2020 and above 2070

Location_List	Scenario_List	ID_List	AnalysisCountry		ScenarioStart	ScenarioEnd	InputType	AnalysisScope
Country or City	Scenario	ID	Country	World Region	Scenario start date	Scenario end date	Type of input	Scope of analysis
text			*text*	*text*	*date*	*date*	*text*	*text*
Narnia	Baseline	NarniaBaseline	Narnia	Sub-Saharan Afr	2020	2030	Fuel Use	Country
Narnia	Unconditional	NarniaUnconditional	Narnia	Sub-Saharan Afr	2020	2030	Fuel Use	Country

If pollutant emissions (PM2.5, SO2, NOx) are available **"Direct Emissions"** should be selected as type of input. Users can then directly proceed to the sheet "DirectEmissions", and leave the sheets "EmissionFactors", "FuelUse" and "CalcEmissions" blank.

If **"Fuel Use"** is chosen as type of input the user needs to fill the sheets "EmissionFactors" and "FuelUse". Emissions will then automatically be calculated in the sheet "CalcEmissions". In this case the sheet "DirectEmissions" can remain blank.

- Enter **key scenario data** including location, name of the scenario, country, time period and scope of the analysis (city- or country-level)
- **Type of input** is dependent on the available inputs:
  - Choose "**Direct Emissions"** if pollutant emissions for $PM_{2.5}$, SO_2 and NO_x are directly available, you can the skip the sheets EmissionFactors, FuelUse and CalcEmissions
  - Choose "**Fuel Use**" if pollutant emissions are not available and proceed to the next sheet

Setting up the tool

Data inputs

INPUTS > >

CALC > >

RESULTS > >

APPENDIX > >

- ScenarioSetUp
- EmissionFactors
- FuelUse
- CalcEmissions
- DirectEmissions
- MortalityRates
- LifeExpectancy
- PopGrowthRate
- PopShareOver25

Emission factors

Sources: GAINS model / user input

Pollution control: Average / Default emission factor

If emission factors are unknow select the type of pollution control and drag default average emission factor to the right, **for biofuels emission factors must be provided by the user !**

AnnualEmissionFactors

ID	Country	Fuel	Pollutant	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
text			type	t	t	t	t	t	t	t	t	t	t	t
NarniaBaseline	Narnia	Diesel	PM2.5	58	58	58	58	58	58	58	58	58	58	58
NarniaBaseline	Narnia	Diesel	SO2	128	128	128	128	128	128	128	128	128	128	128
NarniaBaseline	Narnia	Diesel	NOx	812	812	812	812	812	812	812	812	812	812	812
NarniaBaseline	Narnia	Diesel	CO2	73,400	73,400	73,400	73,400	73,400	73,400	73,400	73,400	73,400	73,400	73,400
NarniaBaseline	Narnia	Gasoline	PM2.5	27	27	27	27	27	27	27	27	27	27	27
NarniaBaseline	Narnia	Gasoline	SO2	0	0	0	0	0	0	0	0	0	0	0
NarniaBaseline	Narnia	Gasoline	NOx	434	434	434	434	434	434	434	434	434	434	434
NarniaBaseline	Narnia	Gasoline	CO2	68,600	68,600	68,600	68,600	68,600	68,600	68,600	68,600	68,600	68,600	68,600
NarniaBaseline	Narnia	Biofuels	PM2.5	0										
NarniaBaseline	Narnia	Biofuels	SO2	0										
NarniaBaseline	Narnia	Biofuels	NOx	0										
NarniaBaseline	Narnia	Biofuels	CO2	0										

- If **emission factors are known** or modelled for the scenarios they can be directly entered into the sheet
- If **emission factors are unknown** the model draws on country-specific emission factors for diesel and gasoline from the GAINS model
  - Select the **type of pollution control** at the top of the sheet and **drag the green formula** to the right
  - Please note! Emission factors for **biofuels** are not available and must be entered manually by the user

Input: Fuel use

Sources: User input

AnnualFuelUse

ID	Fuel	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
text	type	PJ	PJ	PJ	PJ	PJ	PJ	PJ	PJ	PJ	PJ	PJ	PJ
NarniaBaseline	Diesel	36.95	36.76	37.21	38.02	39.06	40.24	41.63	43.26	45.16	47.36	49.92	
NarniaBaseline	Gasoline	1,627.68	1,661.96	1,691.53	1,720.48	1,750.99	1,784.09	1,821.17	1,863.73	1,913.42	1,972.05	2,041.73	
NarniaBaseline	Biofuels	-	-	-	-	-	-	-	-	-	-	-	
NarniaUnconditi													
NarniaUnconditi													
NarniaUnconditi													

- Enter **fuel use** in PJ for diesel, gasoline and biofuels for each year
- Pollutant emissions will then be **calculated automatically** in the CalcEmissions

Input: Calculated emissions

Sources: Own calculations

ID	Pollutant	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
text	type	t	t	t	t	t	t	t	t	t	t	t
NarniaBaseline	PM2.5	46,156	47,072	47,898	48,727	49,612	50,576	51,659	52,904	54,357	56,070	58,102
NarniaBaseline	SO2	4,739	4,715	4,772	4,875	5,009	5,160	5,339	5,548	5,792	6,074	6,401
NarniaBaseline	NOx	735,598	750,305	763,488	776,691	790,760	806,071	823,277	843,052	866,130	893,336	925,613
NarniaBaseline	CO2	114,371,031	116,708,665	118,770,359	120,815,232	122,984,307	125,342,077	127,988,175	131,027,705	134,575,229	138,759,053	143,726,254
NarniaUnconditional	PM2.5	37,913	37,563	37,077	36,529	36,728	36,914	37,096	37,278	37,458	37,630	37,780
NarniaUnconditional	SO2	4,873	5,488	6,197	6,978	7,760	8,567	9,400	10,260	11,144	12,051	12,978
NarniaUnconditional	NOx	603,387	597,253	588,846	579,389	581,911	584,193	586,390	588,563	590,689	592,657	594,260
NarniaUnconditional	CO2	93,391,309	92,156,516	90,521,932	88,689,686	88,753,033	88,767,706	88,757,374	88,732,142	88,688,913	88,610,946	88,466,596

Setting up the tool

Data inputs

INPUTS > >

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ScenarioSetUp

EmissionFactors

FuelUse

CalcEmissions

DirectEmissions

MortalityRates

LifeExpectancy

PopGrowthRate

PopShareOver25

Age-weighted mortality rates

Source: IHME (2020), World Development Indicators (2019)

	Analysis countries	Health impact type	Age category 25- 29	Age category 25- 29	Age category 30 - 34	Age category 30 - 34	Age category 35 - 39	Age category 35 - 39	Age category 40 - 44	Age category 40 - 44	Age category 45- 49	Age category 45- 49	Age category 50 - 54	Age category 50 - 54	Age category 55 - 59	Age category 55 - 59	Age category 60 - 64	Age category 60 - 64	Age category 65- 69	Age categ 65- 69
			MortalityRate	PopShare_2	MortalityRate	PopShare_3	MortalityRate	PopShare_3	MortalityRate	PopShare_4	MortalityRate	PopShare_4	MortalityRate	PopShare_5	MortalityRate	PopShare_5	MortalityRate	PopShare_6	MortalityRate	PopSh
			Mortality rate	Share in populatio	Mortality rate	Share in populatio	Mortality rate	Share in populatio	Mortality rate	Share in populatio	Mortality rate	Share in populatio	Mortality rate	Share in populatio	Mortality rate	Share in populatio	Mortality rate	Share in populatio		
1	Narnia	COPD	0.0025%	19.7%	0.0028%	17.0%	0.0025%	14.8%	0.0032%	12.4%	0.0054%	9.9%	0.0106%	7.8%	0.0122%	6.2%	0.0189%	4.8%		
1	Narnia	LC	0.0008%	19.7%	0.0017%	17.0%	0.0021%	14.8%	0.0030%	12.4%	0.0052%	9.9%	0.0085%	7.8%	0.0100%	6.2%	0.0125%	4.8%		
1	Narnia	IHD	0.0074%	19.7%	0.0155%	17.0%	0.0224%	14.8%	0.0315%	12.4%	0.0498%	9.9%	0.0695%	7.8%	0.0770%	6.2%	0.0962%	4.8%		
1	Narnia	ST	0.0126%	19.7%	0.0146%	17.0%	0.0201%	14.8%	0.0336%	12.4%	0.0427%	9.9%	0.0662%	7.8%	0.0748%	6.2%	0.0952%	4.8%		
2	0	COPD																		

IHME

Global Health Data Exchange | GHDx | Institute for Health Metrics and Evaluation

- Enter **age-specific mortality rates** for COPD, lung cancer, ischemic heart disease and stroke from IHME and the Global Burden of Disease study for each country that is included in the analysis
- To obtain the age-weighted mortality rates add **the percentage share per age group**, e.g. using data from the World Development Indicators

WDI DataFinder

Remaining life expectancy at exact age and time

Source: UN World Population Prospects (2020)

	Analysis countries	Age category	LifeExpectancy 2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
			years	years	years	years	years	years	years	years	years	years	years	years
1	Narnia	25	40.10	40.70	41.41	42.13	42.82	43.47	44.08	44.63	45.15	45.62	46.06	46.48
1	Narnia	30	36.40	36.94	37.55	38.17	38.78	39.35	39.89	40.38	40.84	41.26	41.66	42.05
1	Narnia	35	32.64	33.10	33.64	34.18	34.70	35.21	35.68	36.11	36.52	36.90	37.26	37.61
1	Narnia	40	28.84	29.25	29.71	30.17	30.63	31.07	31.48	31.86	32.22	32.56		
1	Narnia	45	25.04	25.39	25.79	26.19	26.58	26.97	27.33	27.66	27.98	28.28		
1	Narnia	50	21.24	21.54	21.88	22.23	22.57	22.90	23.22	23.51	23.79	24.06		
1	Narnia	55	17.57	17.83	18.12	18.41	18.70	18.99	19.27	19.53	19.77	20.01		
1	Narnia	60	14.08	14.28	14.53	14.77	15.02	15.27	15.50	15.73	15.94	16.15		
1	Narnia	65	10.95	11.11	11.31	11.50	11.70	11.91	12.10	12.29	12.48	12.65		
1	Narnia	70	8.19	8.31	8.46	8.61	8.77	8.94	9.09	9.25	9.40	9.55		
1	Narnia	75	5.94	6.02	6.13	6.25	6.37	6.49	6.61	6.73	6.85	6.97		
1	Narnia	80	2.52	2.54	2.58	2.63	2.67	2.71	2.76	2.81	2.86	2.91	2.97	3.02

UNITED NATIONS
DESA / POPULATION DIVISION
World Population Prospects

- Enter the **remaining life expectancy (years) at exact age and time** for each country that is included in the analysis
- Data can e.g. be derived from the UN World Population Prospects

Setting up the tool

Data inputs

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- ScenarioSetUp
- EmissionFactors
- FuelUse
- CalcEmissions
- DirectEmissions
- MortalityRates
- LifeExpectancy
- PopGrowthRate
- PopShareOver25

Population growth rate

Source: UN World Population Prospects (2020)

PopGrowth_Rate

Population growth rate

	Analysis countries	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
1	Narnia	2.59%	2.57%	2.55%	2.52%	2.50%	2.48%	2.46%	2.44%	2.43%	2.41%	2.39%	2.37%	2.35%	2.34%	2.32%	2.30%	2.28%	2.26%	2.23%	2.21%
2	0																				
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

Population share over 25 years

Source: UN World Population Prospects (2020)

PopOver25_Share PopOver25_Year

Share of population above 25 years

	Analysis countries	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
1	Narnia	36.90%	36.94%	36.98%	37.02%	37.06%	37.10%	37.22%	37.34%	37.46%	37.58%	37.70%	37.92%	38.14%	38.36%	38.58%	38.80%	39.08%	39.36%	39.64%	39.92%
2	0																				
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

UNITED NATIONS
DESA / POPULATION DIVISION
World Population Prospects

- Enter the **population growth rate** and **percentage share of population over 25 years of age** for each year and country that is included in the analysis
- Data can e.g. be derived from the UN World Population Prospects

Generating results

Calculations

INPUTS > >

CALC > >

RESULTS > >

APPENDIX > >

- ExposedPopTotal
- ExposedPop25
- IntakeFraction
- ConcentrationChange
- RelativeRisk[…]
- Emissions
- BaseCases
- DeathsPerTonne
- PrematureDeaths
- OtherPrematureDeaths
- YearsOfLifeLost

Total exposed population

Source: Own calculations

ID	Location	Country	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
text	text	text	million	million	million	million	million	million	million	million	million	million	million	million	million	million	million	million	million	million	million	million	million	million
NarniaBaseline	Narnia	Narnia	158.42	162.49	166.63	170.83	175.11	179.45	183.87	188.36	192.93	197.58	202.30	207.10	211.97	216.93	221.95	227.06	232.23	237.47	242.78	248.15	253.58	259.
NarniaUnconditional	Narnia	Narnia	158.42	162.49	166.63	170.83	175.11	179.45	183.87	188.36	192.93	197.58	202.30	207.10	211.97	216.93	221.95	227.06	232.23	237.47	242.78	248.15	253.58	259.

Exposed population over 25 years

Source: Own calculations

ExposedPopOver25

ID	Location	Country	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
text	text	text	million	million	million	million	million	million	million	million	million	million	million	million	million	million	million	million	million	million	million	million
NarniaBaseline	Narnia	Narnia	66.58	68.44	70.33	72.27	74.25	76.27	78.53	80.85	83.21	85.63	88.10	90.76	93.47	96.24	99.06	101.94	104.97	108.07	111.21	114.42
NarniaUnconditional	Narnia	Narnia	66.58	68.44	70.33	72.27	74.25	76.27	78.53	80.85	83.21	85.63	88.10	90.76	93.47	96.24	99.06	101.94	104.97	108.07	111.21	114.42

Intake fraction

Source: Own calculations

ID	Location	Country	Pollutant	2015	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
text	text	text	type	g of PM2.5 inhaled per tonne of emissions															
NarniaBaseline	Narnia	Narnia	PM2.5	37.22	42.16	43.20	44.25	45.33	46.42	47.53	48.65	49.80	50.96	52.14	53.34	54.56	55.79	57.04	58.30
NarniaBaseline	Narnia	Narnia	SO2	1.32	1.50	1.53	1.57	1.61	1.65	1.69	1.73	1.77	1.81	1.85	1.89	1.94	1.98	2.03	2.07
NarniaBaseline	Narnia	Narnia	NOx	0.27	0.31	0.32	0.33	0.33	0.34	0.35	0.36	0.37	0.38	0.39	0.39	0.40	0.41	0.42	0.43
NarniaUnconditional	Narnia	Narnia	PM2.5	37.22	42.16	43.20	44.25	45.33	46.42	47.53	48.65	49.80	50.96	52.14	53.34	54.56	55.79	57.04	58.30
NarniaUnconditional	Narnia	Narnia	SO2	1.32	1.50	1.53	1.57	1.61	1.65	1.69	1.73	1.77	1.81	1.85	1.89	1.94	1.98	2.03	2.07
NarniaUnconditional	Narnia	Narnia	NOx	0.27	0.31	0.32	0.33	0.33	0.34	0.35	0.36	0.37	0.38	0.39	0.39	0.40	0.41	0.42	0.43
	0	0	PM2.5																
	0	0	SO2																
	0	0	NOx																

[…]

- All of these sheets are **calculated automatically**
  - Make sure that **formulas are dragged down** until the end of the scenario list in every sheet
  - Calculations are based on user inputs and default input parameters in the back of the file, each calculation step is transparent to the user and can be traced back

Generating results

Calculations

INPUTS > >
CALC > >
RESULTS > >
APPENDIX > >

ExposedPopTotal
ExposedPop25
IntakeFraction
ConcentrationChange
RelativeRisk[…]
Emissions
BaseCases
DeathsPerTonne
PrematureDeaths
OtherPrematureDeaths
YearsOfLifeLost

Premature deaths from lower respiratory infections (LRI)

Source: Own calculations

	ScenarioPD	COPD_Total	LC_Total	IHD_Total	ST_Total		ScenarioScalingFactor		LRI_Total		
ID	Total premature deaths (excluding LRI)						Premature deaths from lower respiratory infections (LRI)				
text	COPD	LC	IHD	ST	Total		Scaling factor	Share of deaths in children	Total premature deaths from LRI	Children	Adults
NarniaBaseline	836	747	7,842	14,295	23,720		1.51	0.81	35,811	28,906	6,905
NarniaUnconditional	607	542	5,694	10,381	17,224		1.51	0.81	26,005	20,991	5,014
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
	-	-	-	-	-		0.00	0.00	-	-	-
							0.00	0.00			

Premature deaths caused by lower respiratory infections (LRI) are estimated scaling up the results for COPD, lung cancer, ischemic heart disease and stroke calculated in this tool. Scaling factors are calculated based on the results of the Global Burden of Disease study (2021) for seven different world regions. This is a simplified approach but provides a good indication of the additional disease burden from LRI on adults and children.

- Premature deaths caused by lower respiratory infections (LRI) are estimated scaling up the results for COPD, lung cancer, ischemic heart disease and stroke calculated in the tool:
  - **Scaling factors** are calculated based on the results of the Global Burden of Disease study (2021) for seven different world regions
  - See sheet OtherInput or the methodology note for an overview of these factors
- This is a **simplified approach** but provides a good indication of the additional disease burden from LRI on adults and children

Results overview

Scenario dashboard

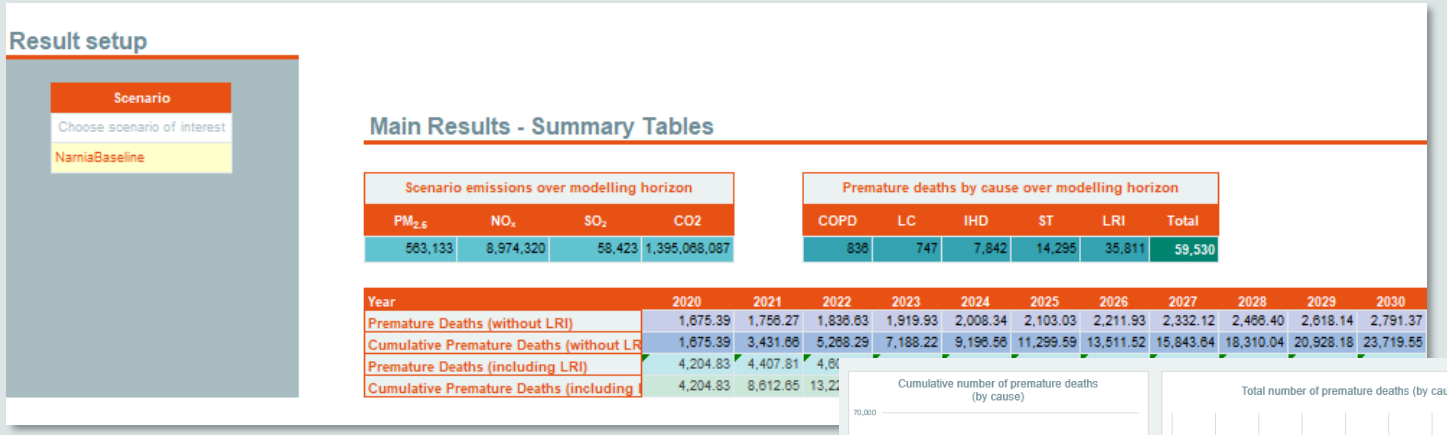
INPUTS > >

CALC > >

RESULTS > >

Scenario

APPENDIX > >



- Choose the scenario of interest from the drop-down-list under ***Results setup***
- The tool will automatically generate **results tables** for the different impacts, including:
  - **Summary tables** over the modelling horizon for pollutant emissions and health impacts by cause
  - A table for **annual results** for premature deaths and years of life lost
- The **results dashboard** includes visualisations of these tables

Fixed input parameters

Default data

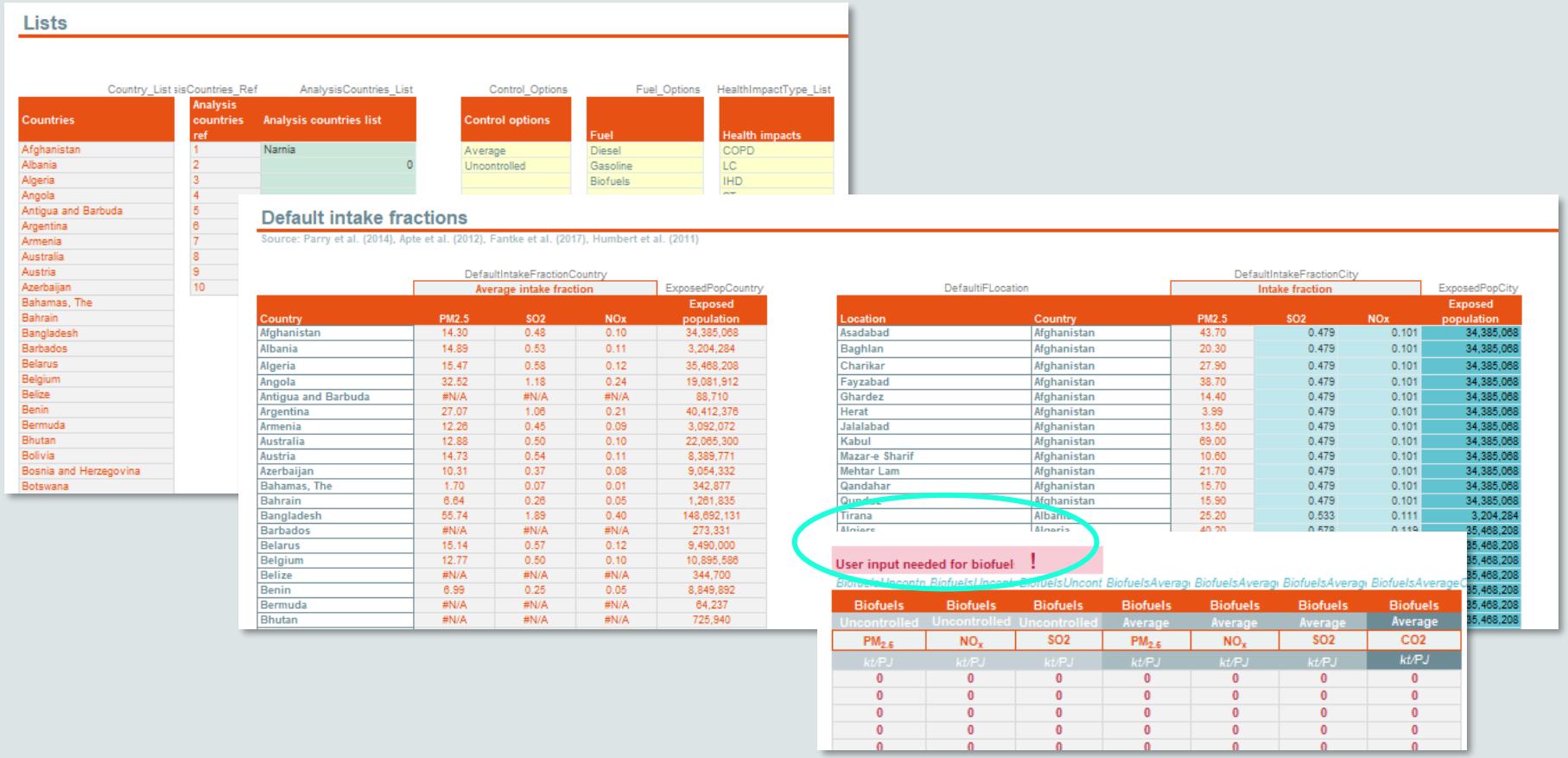
INPUTS > >

CALC > >

RESULTS > >

APPENDIX > >

- Lists
- DefaultEmissionFactors
- DefaultIntakeFractions
- OtherInput



Lists

Country_List

Countries
Afghanistan
Albania
Algeria
Angola
Antigua and Barbuda
Argentina
Armenia
Australia
Austria
Azerbaijan
Bahamas, The
Bahrain
Bangladesh
Barbados
Belarus
Belgium
Belize
Benin
Bermuda
Bhutan
Bolivia
Bosnia and Herzegovina
Botswana

sisCountries_Ref

Analysis countries ref
1
2
3
4
5
6
7
8
9
10

AnalysisCountries_List

Analysis countries list
Narnia
0

Control_Options

Control options
Average
Uncontrolled

Fuel_Options

Fuel
Diesel
Gasoline
Biofuels

HealthImpactType_List

Health impacts
COPD
LC
IHD

Default intake fractions

Source: Parry et al. (2014), Apte et al. (2012), Fantke et al. (2017), Humbert et al. (2011)

DefaultIntakeFractionCountry

Country	Average intake fraction PM2.5	SO2	NOx	ExposedPopCountry Exposed population
Afghanistan	14.30	0.48	0.10	34,385,068
Albania	14.89	0.53	0.11	3,204,284
Algeria	15.47	0.58	0.12	35,468,208
Angola	32.52	1.18	0.24	19,081,912
Antigua and Barbuda	#N/A	#N/A	#N/A	88,710
Argentina	27.07	1.06	0.21	40,412,376
Armenia	12.26	0.45	0.09	3,092,072
Australia	12.88	0.50	0.10	22,065,300
Austria	14.73	0.54	0.11	8,389,771
Azerbaijan	10.31	0.37	0.08	9,054,332
Bahamas, The	1.70	0.07	0.01	342,877
Bahrain	6.64	0.26	0.05	1,261,835
Bangladesh	55.74	1.89	0.40	148,692,131
Barbados	#N/A	#N/A	#N/A	273,331
Belarus	15.14	0.57	0.12	9,490,000
Belgium	12.77	0.50	0.10	10,895,586
Belize	#N/A	#N/A	#N/A	344,700
Benin	6.99	0.25	0.05	8,849,892
Bermuda	#N/A	#N/A	#N/A	64,237
Bhutan	#N/A	#N/A	#N/A	725,940

DefaultIFLocation

DefaultIntakeFractionCity

Location	Country	Intake fraction PM2.5	SO2	NOx	ExposedPopCity Exposed population
Asadabad	Afghanistan	43.70	0.479	0.101	34,385,068
Baghlan	Afghanistan	20.30	0.479	0.101	34,385,068
Charikar	Afghanistan	27.90	0.479	0.101	34,385,068
Fayzabad	Afghanistan	38.70	0.479	0.101	34,385,068
Ghardez	Afghanistan	14.40	0.479	0.101	34,385,068
Herat	Afghanistan	3.99	0.479	0.101	34,385,068
Jalalabad	Afghanistan	13.50	0.479	0.101	34,385,068
Kabul	Afghanistan	69.00	0.479	0.101	34,385,068
Mazar-e Sharif	Afghanistan	10.60	0.479	0.101	34,385,068
Mehtar Lam	Afghanistan	21.70	0.479	0.101	34,385,068
Qandahar	Afghanistan	15.70	0.479	0.101	34,385,068
[illegible]	Afghanistan	15.90	0.479	0.101	34,385,068
Tirana	Albania	25.20	0.533	0.111	3,204,284
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	35,468,208

User input needed for biofuel !

Biofuels Uncontrolled $PM_{2.5}$ kt/PJ	Biofuels Uncontrolled NO_x kt/PJ	Biofuels Uncontrolled SO2 kt/PJ	Biofuels Average $PM_{2.5}$ kt/PJ	Biofuels Average NO_x kt/PJ	Biofuels Average SO2 kt/PJ	Biofuels Average CO2 kt/PJ
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

- All default data, inputs into drop-down menus etc. can be found in the Appendix
- Users are advised to **not edit** any of these sheets
- Only for **biofuel emission factors** user input is required when using the default calculations, cells can be simply overwritten

QUESTIONS / COMMENTS / FEEDBACK

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INTERNATIONAL CLIMATE INITIATIVE (IKI)

COMPASS: navigating climate action impacts

AIRPOLIM-T is part of NewClimate Institute's COMPASS toolbox, further information and other available tools can be found at: newclimate.org/resources/tools/compass-toolbox

Climate action

Outcomes and
mitigation
policy
assessment
toolbox

Selection of **climate scenario modelling tools** developed by NewClimate Institute to support decision-makers, analysts and civil society to **assess and understand the impacts of climate action and policies**

Principles of tool development

- **Publicly available** // free // open-source
- **Accessible** to a range of users with different levels of technical expertise
- **Transparent** inputs, assumptions, calculations and outputs
- **Improve access to information** to assist informed, evidence-based decisions
- **Address modelling gaps**; avoid duplication
- **Enable raising climate ambition** by exploring opportunities and barriers

Common features across tools

- **Focused on impacts** of actions and policies to mitigate climate change
- **Modular setup**, designed to be used either as *standalone* tools; or with *soft links* to other Compass tools and/or third party models
- **Excel-based** analytical tools
- **Facilitate comparison** across different scenarios / policies / outcomes
- **Explore** potential opportunities and barriers to raise climate ambition

COMPASS: navigating climate action impacts

AIRPOLIM-T is part of NewClimate Institute's COMPASS toolbox, further information and other available tools can be found at: newclimate.org/resources/tools/compass-toolbox

Analyse sustainable development impacts

Suite of analytical tools to help understand the impacts of climate action on sustainable development objectives:

- SDG Climate Action Nexus tool (SCAN)
- Economic Impact Model for Electricity Supply (EIM-ES)
- Air Pollution Impact Model for Electricity Supply (AIRPOLIM-ES)
- Air Pollution Impact Model for Transport (AIRPOLIM-T)
- Transport Sector Climate Action Co-benefits Evaluation tool (TRACE)

Track and analyse GHG emission scenarios

PROSPECTS+ is a tool to track and project GHG emission scenarios from all key emitting sectors. It allows users to adjust key emissions levers in each sector and provides a dashboard of critical indicators and reporting tools to analyse emissions across time under a range of pathways.

Assess sectoral climate policies

Tools to support policy impact projections drawing on technology S-curve modelling logic:

- EV policy impact assessment tool
- RE policy impact assessment tool
- Buildings policy impact assessments
- Industrial (cement + steel) policy impact assessments