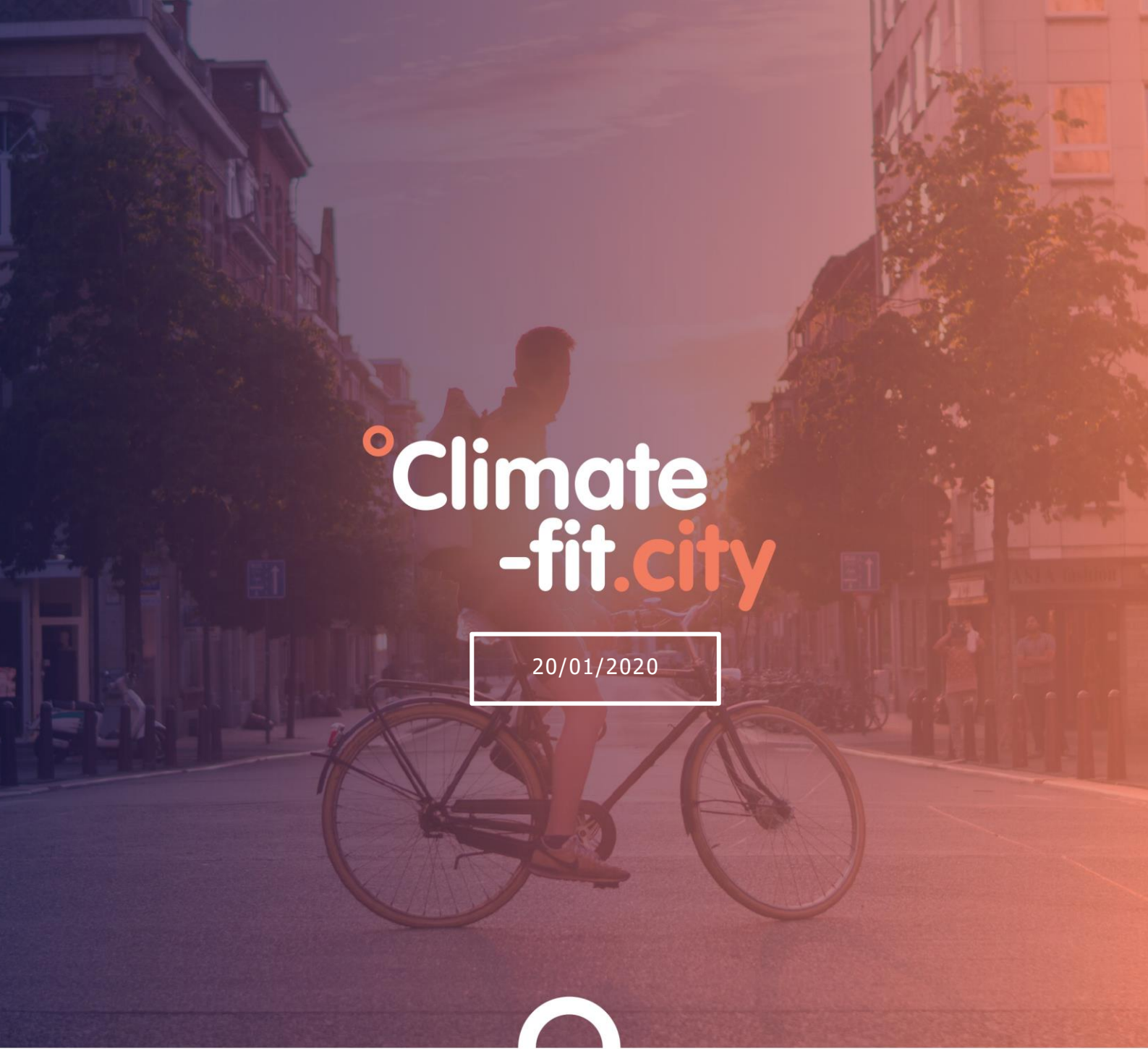

Data Management Plan

Final Version

PUCS has received funding
from the European Union's Horizon 2020
Research and Innovation Programme
under Grant Agreement No. 730004

Deliverable 1.1	Data Management Plan
Related Work Package:	**WP1 – Co-ordination**
Deliverable lead:	**VITO**
Author(s):	**Dirk Lauwaet, Filip Lefebre, Nele Veldeman**
Contact for queries	dirk.lauwaet@vito.be
Grant Agreement Number:	n° 730004
Instrument:	HORIZON 2020
Start date of the project:	01 June 2017
Duration of the project:	30 months
Website:	www.climate-fit.city
Abstract	In this document we describe the data management for the Climate-fit City project. This data management is largely achieved through deposing and referencing the data in a VITO hosted web platform. We distinguish between two broad groups of data: (1) basic urban climate information and (2) sectoral climate information. The basic urban climate data is made fully and openly accessible. The sectoral climate data are deemed less relevant for the general public, but can be accessed or requested through the links and contacts in this document.

Dissemination level of the document

X	PU	Public
	PP	Restricted to other programme participants (including the Commission Services)
	RE	Restricted to a group specified by the consortium (including the European Commission Services)
	CO	Confidential, only for members of the consortium (including the European Commission Services)

Versioning and Contribution History

Version	Date	Author	Description
v.01	30/03/2018	Koen De Ridder, Filip Lefebre, Dirk Lauwaet, Hans Hooyberghs.	First version
v.2	17/05/2019	Dirk Lauwaet, Filip Lefebre, Nele Veldeman, Wim Peelaerts	Second version
v.3	20/01/2020	Dirk Lauwaet, Filip Lefebre, Nele Veldeman	Final version

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

Table of Contents

1. Data overview **4**
1.1. WP2 Demonstration cases *5*
1.2. WP4 Replication cases *10*
1.3. WP5 Urban Climate Data *16*

2. Findable, accessible, Interoperable, reusable (FAIR) data **21**
2.1. Making data findable, including provisions for metadata *21*
2.2. Making data openly accessible *21*
2.3. Making data interoperable *21*
2.4. Increase data re-use *21*

3. Allocation of resources **22**

4. Data security **22**

5. Ethical aspects **22**

PUCS has received funding
from the European Union's Horizon 2020
Research and Innovation Programme
under Grant Agreement No. 730004

1. Data overview

To deliver its urban climate services, the Climate-fit.city project generates and processes climate and sectoral data at the scale of individual cities. Two sorts of data are being generated: (1) **basic urban climate data**, fairly generic and mostly using scientific data formats such as e.g. NetCDF, and (2) **sectoral climate data**, i.e., value added information that builds on the data in (1), and generally in a format that complies with the practice of the end-user (e.g. MS Excel table). The generic urban climate data stem from either the UrbClim model (VITO) or from the statistical downscaling approach (KULeuven). The sectoral climate-related information is generated through the implementation of sectoral case studies. The total amount of raw data produced by the project is in the order of 15 TB. An overview of these data are given in the Tables below.

The generic urban climate data is meant to be useful to so-called climate service purveyors, i.e., organisations that create added value onto the generic climate data by combining them with sectoral information. Therefore, within the framework of the project an **Urban Climate Data web platform** is set up and hosted by VITO, to make the data easily accessible and reusable to any interested parties. More details on this web platform are provided in the next Chapters of this data management plan.

The sectoral climate information is mostly relevant for the end-users that are partners in the project and they can be accessed through the references and links that are provided in this document.

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

1.1. WP2 Demonstration cases

Table 1: Overview of the datasets generated in the Climate&Health Demonstration case

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
Several different climate indicators at different administrative levels of Barcelona for historical periods as well as future periods of 30 years for different RCPs scenarios. Combination of past data with mortality geo-located data to generate heat risk levels for each district stratified by sex, age and level of studies. Analysis of the effects of other socio-economic indicators in the risk level estimation.	html, leaflet, excel table, netcdf, shapefile	ASPB/ISGlobal /VITO	Joan Ballester joan.ballester@isglobal.org	https://aspb.shinyapps.io/climate-fit-city/	No. Users will be able to download all data displayed in the website.

Table 1: Overview of the datasets generated in the Building Energy Demonstration case (Typical Meteorological Years based on Meteonorm 7.3)

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
TMY for Bern / Zollikofen, 2000-2009	IDA-ICE	Meteotest	Jan Remund (jan.remund@meteotest.ch)	On request	none
TMY for Bern / Bollwerk, 2000-2009	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Bern / VonRoll, 2000-2009	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Vienna / Airport, 2000-2009	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Vienna / Hohe Warte, 2000-2009	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Vienna / Centre, 2000-2009	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Bern / Zollikofen, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Bern / Bollwerk, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Bern / VonRoll, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
TMY for Vienna / Airport, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Vienna / Hohe Warte, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Vienna / Centre, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Bern / Zollikofen, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Bern / Bollwerk, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Bern / VonRoll, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Vienna / Airport, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Vienna / Hohe Warte, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Vienna / Centre, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none

Table 2: Overview of the datasets generated in the Emergency Planning Demonstration case

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
Urban flood hazard maps for city of Antwerp, for return periods of return periods of 2, 10, 25 and 100 years, for current climate and future climate 2050 & 2100 (high climate scenario)	GIS maps & web viewer	KU Leuven	Patrick Willems patrick.willems@kuleuven.be	https://stadantwerpen.maps.arcgis.com/apps/webappviewer/index.html?id=cb678a3d1cd94533baeb95d5cee3ebe3	No
Location of urban flood risk zones for city of Antwerp, overlaying the flood hazard maps with locations of hospitals, power grid, public transport, local police & vulnerable institutions and enterprises	Web viewer	City of Antwerp	Erik De Bruyn erik.debruyn@antwerpen.be	https://stadantwerpen.maps.arcgis.com/apps/webappviewer/index.html?id=cb678a3d1cd94533baeb95d5cee3ebe3	No

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

Table 3: Overview of the datasets generated in the Urban Planning Demonstration case

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
100m resolution heat stress maps representing indicators: - Urban Heat Island (UHI) and - Number of Heat Wave Days (HWD) for the cities of Prague and Ostrava. + results of modelling for various city development scenarios for the same indicators. Maps are calculated based on historical (2007-2016) meteorological variables (T, RH, Ws) from the UrbClim model, based on ERA-Interim input data.	Geotiff	VITO/GISAT	Dirk Lauwaet dirk.lauwaet@vito.be Katerina Jupova katerina.jupova@gisat.cz	https://urban-tep.eu/puma/tool/	No
1m resolution heat stress map (WBGT indicator) for a selected hot day for parts of the cities of Prague, Ostrava and Hodonin + results of modelling for various development scenarios of the site for the same indicators (WBGT)	Geotiff	VITO/GISAT	Dirk Lauwaet dirk.lauwaet@vito.be Katerina Jupova katerina.jupova@gisat.cz	https://urban-tep.eu/puma/tool/	No

Table 4: Overview of the datasets used or generated in the Active Mobility Demonstration case

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
Data used					
Daily data from Vienna's permanent bicycle traffic monitoring stations for the period 01/01/2011 to 31/08/2017. The data was provided on request by the City of Vienna. Up to the year 2016 it is, however, also publicly accessible (as of February 2019).	xlsx	City of Vienna	post@ma46.wien.gv.at	https://www.data.gv.at/katalog/dataset/stadt-wien_radverkehrszhlungenderstadtwien	Terms of use: https://data.wien.gv.at/nutzungsbedingungen
Tracked trips of users of the Bike Citizens App in Vienna and its near surroundings for the period 01/01/2015	GPX	Bike Citizens Mobile Solutions GmbH	Mihai Ghete Mihai@bikecitizens.net	On request	Further use to be decided on a case by case

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
to 31/08/2017.					basis
UrbClim output fields for the city of Vienna (see **Error! Reference source not found.** for further details).	Geotiff	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Historical (2010-2017) 10-minute resolution precipitation data from the measurement station of the University of Natural Resources and Life Sciences (BOKU)	csv	University of Natural Resources and Life Sciences (BOKU)	Christian Gützer (station) christian.guetzer@boku.ac.at Michael Scheck (data transfer) michael.scheck@boku.ac.at	https://meteo.boku.ac.at/wetter/mon-archiv/	No
Daily historical (2010-2017) meteorological variables (snow, new snow) from the measurement station "*Hohe Warte*"	xlsx	Austrian Institute for Meteorology and Geodynamics (ZAMG)	dion@zamg.ac.at	https://www.zamg.ac.at/cms/de/klima/klimauebersichten/jahrbuch	No
Future precipitation scenarios (2030, 2050, 2100) for the BOKU station.	Ascii	KULeuven	Patrick Willems Patrick.willems@kuleuven.be	On request	No
Population of Vienna (2008-2017)	xlsx	Statistics Austria	info@statistik.gv.at	http://www.stat.at/web_de/statistiken/menschen_und_gesellschaft/bevoelkerung/volkszaehlungen_registerzaehlungen_abgestimmte_erwerbsstatistik/bevoelkerungsstand/index.html	No
Road network of Vienna extracted from the Intermodal Transport Reference System Of Austria (GIP.at); version 2017-08.	shp	Austrian Institute for Traffic Data Infrastructure (ÖVDAT)	ogd@gip.gv.at	https://www.data.gv.at/katalog/dataset/3fefc838-791d-4dde-975b-a4131a54e7c5	Terms of use: https://creativecommons.org/licenses/by/3.0/at/deed.de
Data generated					
100 m resolution maps of cycling-tailored climate indices (e.g. WBGT on hot/cold days during daytime, wind speed on windy days during daytime, etc.) for current and future (2050s; RCP4.5, RCP8.5) climatic conditions for	Geotiff	VITO/JR	Judith Köberl judith.koeberl@joanneum.at	On request	No

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
Vienna.					
Response functions for Vienna illustrating the relationship between (i) bicycle traffic volume and meteorological conditions, (ii) trip distance and meteorological conditions, and (iii) cycling speed and meteorological conditions	rds, csv	JR	Judith Köberl judith.koeberl@joanneum.at	On request; As far as used within peer-reviewed scientific publications it will be made accessible via Zenodo	No
Evaluations of Vienna's climatic attractiveness for cycling	rds, csv	JR	Judith Köberl judith.koeberl@joanneum.at	On request; As far as used within peer-reviewed scientific publications it will be made accessible via Zenodo	No

Table 5: Overview of the datasets generated in the Cultural Heritage Demonstration case

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
Daily forecasted air quality, meteo and heat stress indicators (score 0-10) for the next 5 days for 40 sites in and around Rome. Data starts from 01/01/2019.	html	SSBAR/VITO	Pino Arcidiacono p.arcidiacono276@gmail.com	http://climate-fit.soprintendenzaspecialeroma.it	No

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

1.2. WP4 Replication cases

Table 7: Overview of the datasets generated in the Climate&Health Replication case

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
Several different climate indicators at different administrative levels for historical periods as well as future periods of 30 years for different RCPs scenarios. Combination of past data with mortality geo-located data to generate heat risk levels for each district stratified by sex, age and level of studies. Analysis of the effects of other socio-economic indicators in the risk level estimation.	html, leaflet, excel table, netcdf, shapefile	LHTSM/ISGlobal/VITO	Joan Ballester joan.ballester@isglobal.org	https://londonheat.shinyapps.io/climate-fit-city/	No. Users will be able to download all data displayed in the website.

Table 6: Overview of the datasets generated in the Building Energy Replication case (Typical Meteorological Years based on Meteonorm 7.3)

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
TMY for Barcelona / Airport, 2000-2009	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Barcelona / Centre, 2000-2009	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Barcelona / Mont Juic, 2000-2009	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Prague / Airport, 2000-2009	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Prague / Centre, 2000-2009	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Prague / Kbely, 2000-2009	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Rome / Urbe, 2000-2009	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Rome / Centre, 2000-2009	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Rome / Celimontana, 2000-2009	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Barcelona / Airport, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Barcelona / Centre, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
TMY for Barcelona / Mont Juic, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Prague / Airport, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Prague / Centre, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Prague / Kbely, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Rome / Urbe, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Rome / Centre, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Rome / Celimontana, 2046-2055, RCP 4.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Barcelona / Airport, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Barcelona / Centre, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Barcelona / Mont Juic, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Prague / Airport, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Prague / Centre, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Prague / Kbely, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Rome / Urbe, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Rome / Centre, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none
TMY for Rome / Celimontana, 2046-2055, RCP 8.5	IDA-ICE	Meteotest	Jan Remund	On request	none

Table 7: Overview of the datasets generated in the Emergency Planning Replication case

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
Urban flood hazard maps for different return periods, for current climate and future climate 2050 and 2100 (high climate scenario) for city of Tirana	GIS maps	KU Leuven	Patrick Willems patrick.willems@kuleuven.be	On request	No

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

Table 8: Overview of the datasets generated in the Urban Planning Replication case

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
100m resolution heat stress maps representing indicators: - Urban Heat Island (UHI) and - Number of Heat Wave Days (HWD) for the city of Dhaka (Bangladesh) + results of modelling for various city development scenarios for the same indicators. Maps are calculated based on historical (2007-2016) meteorological variables (T, RH, Ws) from the UrbClim model, based on ERA-Interim input data.	Geotiff	VITO/GISAT	Dirk Lauwaet dirk.lauwaet@vito.be Katerina Jupova katerina.jupova@gisat.cz	https://urban-tep.eu/puma/tool/	WoldBankGroup
1m resolution heat stress map (WBGT indicator) for a selected hot day for part of the city of Dhaka (Bangladesh) + results of modelling for various development scenarios of the site for the same indicators (WBGT)	Geotiff	VITO/GISAT	Dirk Lauwaet dirk.lauwaet@vito.be Katerina Jupova katerina.jupova@gisat.cz	https://urban-tep.eu/puma/tool/	WoldBankGroup

Table 9: Overview of the datasets used or generated in the Active Mobility Replication case

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
Data used					
Hourly data from Berlin's permanent bicycle traffic monitoring stations for the period 01/03/2012 to 31/12/2017.	xlsx	City of Berlin	verkehrslenkung@senuvk.berlin.de	https://www.berlin.de/senuvk/verkehr/lenkung/vlb/de/radzaehlungen.shtml	No
Hourly data from Bremen's permanent bicycle traffic monitoring stations for the period 01/11/2010 to 31/01/2019.	xlsx	City of Bremen	Waldemar Quella waldemar.quella@asv.bremen.de	On request	No
Tracked trips of users of the Bike Citizens App in Berlin and Bremen.	GPX	Bike Citizens Mobile Solutions GmbH	Mihai Ghete Mihai@bikecitizens.net	On request	Further use to be decided on a case by case

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
					basis
UrbClim output fields for the cities of Bremen and Berlin (see **Error! Reference source not found.** for further details).	Geotiff	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Hourly historical (2010-2018) precipitation data from several measurement stations in Berlin and Bremen (Berlin-Buch, Verlin-Dahlem, Berlin-Kaniswall, Berlin-Marzahn, Berlin-Schänefeld, Berlin-Tegel, Berlin-Tempelhof, Bremen)	txt	DWD (German Weather Service)	klima.vertrieb@dwd.de	ftp://ftp-cdc.dwd.de/pub/CDC/observations_germany/climate/hourly/precipitation/	Terms of use: ftp://ftp-cdc.dwd.de/pub/CDC/Nutzungsbedingungen_German.pdf
Daily historical (2010-2018) precipitation data, including snow, from several measurement stations in Berlin and Bremen (Berlin-Buch, Verlin-Dahlem, Berlin-Kaniswall, Berlin-Marzahn, Berlin-Schänefeld, Berlin-Tegel, Berlin-Tempelhof, Bremen)	txt	DWD	klima.vertrieb@dwd.de	ftp://ftp-cdc.dwd.de/pub/CDC/observations_germany/climate/daily/more_precip/	Terms of use: ftp://ftp-cdc.dwd.de/pub/CDC/Nutzungsbedingungen_German.pdf
Hourly 1km resolution historical (2010-2018) precipitation data for Germany from the "RADOLAN precipitation raster"	Ascii	DWD	klima.vertrieb@dwd.de	ftp://ftp-cdc.dwd.de/pub/CDC/grids_germany/hourly/radolan/	Terms of use: ftp://ftp-cdc.dwd.de/pub/CDC/Nutzungsbedingungen_German.pdf
Future precipitation scenarios (2030, 2050, 2100) for Berlin and Bremen.	Ascii	KULeuven	Patrick Willems Patrick.willems@kuleuven.be	On request	No
Population of Berlin (2008-2017)	xlsx	Amt für Statistik Berlin Brandenburg	StatIS-BBB@statistik-bbb.de	https://www.statistik-berlin-brandenburg.de/webapi/jsf/dataCatalogueExplorer.xhtml	No
Population of Bremen (2008-2017)	xlsx	Statistisches Landesamt Bremen	info@statistik.bremen.de	http://www.statistik-bremen.de/bremendat/statwizard_step1.cfm?tabelle=17332	No

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
Road network of Berlin and Bremen from OpenStreetMap; version 2017-08.	shp	Geofabrik GmbH, OpenStreetMap Contributors	info@geofabrik.de	http://download.geofabrik.de/europe/germany.html	Terms of use: https://creativecommons.org/licenses/by-sa/2.0/legalcode
Data generated					
100 m resolution maps of cycling-tailored climate indices (e.g. WBGT on hot/cold days during daytime, wind speed on windy days during daytime, etc.) for current and future (2050s; RCP4.5, RCP8.5) climatic conditions for Berlin and Bremen.	Geotiff	VITO/JR	Judith Köberl judith.koeberl@joanneum.at	On request	No
Response functions for Berlin and Bremen illustrating the relationship between (i) bicycle traffic volume and meteorological conditions, (ii) trip distance and meteorological conditions, and (iii) cycling speed and meteorological conditions.	rds, csv	JR	Judith Köberl judith.koeberl@joanneum.at	On request; As far as used within peer-reviewed scientific publications it will be made accessible via Zenodo	No
Evaluations of Berlin's and Bremen's climatic attractiveness for cycling.	rds, csv	JR	Judith Köberl judith.koeberl@joanneum.at	On request; As far as used within peer-reviewed scientific publications it will be made accessible via Zenodo	No

Table 10: Overview of the datasets generated in the Cultural Heritage Replication case

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
Monthly historical (2000-2017) and future (2020,2030,2040,2050; RCP4.5 and RCP8.5) meteorological variables (temperature, humidity, rainfall, wind speed) at the location of the Zoo.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
1m resolution heat stress map for a selected hot day for the Zoo area.	Geotiff	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://kmda.climate-fit.city/	No
Forecast of monthly energy and water usage relative to historical numbers	txt	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://kmda.climate-fit.city/	No

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

1.3. WP5 Urban Climate Data

Table 11: Overview of the datasets generated for the Demonstration cases

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
Hourly 100m resolution historical (1987-2016) meteorological variables (T, RH) from the UrbClim model, based on ERA-Interim input data, for the city of Barcelona.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Hourly 100m resolution future (2011-2100) meteorological variables (T) from the UrbClim model, based on RCP4.5/8.5, for the city of Barcelona.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Percentiles (1 to 100%) of changes, based on CMIP5 climate models for future climate (2011-2040, 2041-2070 en 2071-2100, RCP4.5/8.5) for meteorological variables (Tmean, RH, Ws, Wdir, Rs, Pr), per month, for city of Barcelona	Ascii	KU Leuven	Patrick Willems patrick.willems@kuleuven.be	https://dataplatform.climate-fit.city/	No
Hourly 100m resolution historical (1987-2016) meteorological variables (T, RH, Ws, Wdir, Pr, Rs) from the UrbClim model, based on ERA-Interim input data, for the city of Bern.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Hourly 100m resolution future (2051-2071) meteorological variables (T, RH, Ws) from the UrbClim model, based on RCP4.5/8.5, for the city of Bern.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Percentiles (1 to 100%) of changes, based on CMIP5 climate models for future climate (2051-2070, RCP4.5/8.5) for meteorological variables (Tmean, RH, Ws, Wdir, Rs, Pr), per month, for city of Bern	Ascii	KU Leuven	Patrick Willems patrick.willems@kuleuven.be	https://dataplatform.climate-fit.city/	No
Hourly 100m resolution historical (2007-2016) meteorological variables (T, RH, Ws) from the	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
UrbClim model, based on ERA-Interim input data, for the city of Prague and Ostrava.					
Hourly 100m resolution future (2026-2035 and 2046-2055) meteorological variables (T) from the UrbClim model, based on RCP4.5/8.5, for the city of Prague and Ostrava.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
1m resolution heat stress map for a selected hot day for parts of the cities of Prague, Ostrava and Hodonin	Geotiff	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	On request	No
Percentiles (1 to 100%) of changes, based on CMIP5 climate models for future climate (2030 & 2050; RCP4.5/8.5) for meteorological variables (Tmean), per month, for city of Prague	Ascii	KU Leuven	Patrick Willems patrick.willems@kuleuven.be	https://dataplatform.climate-fit.city/	No
Hourly 100m resolution historical (2010-2016) meteorological variables (T, RH, Ws, Wdir, Pr, Rs, Snow, WBGT) from the UrbClim model, based on ERA5 input data, for the city of Vienna.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Hourly 100m resolution future (2027-2033 and 2047-2053) meteorological variables (T, RH, Ws, WBGT) from the UrbClim model, based on RCP4.5/8.5, for the city of Vienna.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Percentiles (1 to 100%) of changes, based on CMIP5 climate models for future climate (2036-2065; RCP4.5/8.5) for meteorological variables (Tmean, RH, Ws, Wdir, Rs, Pr), per month, for city of Vienna	Ascii	KU Leuven	Patrick Willems patrick.willems@kuleuven.be	https://dataplatform.climate-fit.city/	No
For city of Vienna : Monthly & seasonal precipitation amount Monthly & seasonal wet day frequency Per month & season: daily precipitation intensity for return periods of 0.1, 0.25, 0.5, 1, 2, 5, 10	Images	KU Leuven	Patrick Willems patrick.willems@kuleuven.be	On request	No

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
and 20 years					
For city of Vienna : The observed hourly time series for Vienna, station BOKU, period July 2005 – June 2018, perturbed for each of the 165 CMIP5 based climate model runs available for that station => Ensemble of 165 time series, and this for the future horizons 2030, 2050 and 2100.	Ascii	KU Leuven	Patrick Willems patrick.willems@kuleuven.be	On request	No
Hourly 100m resolution historical (1987-2016) meteorological variables (T, RH, Ws, WBGT) from the UrbClim model, based on ERA-Interim input data, for the city of Rome.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Hourly 100m resolution future (2036-2065) meteorological variables (T) from the UrbClim model, based on RCP4.5/8.5, for the city of Rome.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Percentiles (1 to 100%) of changes, based on CMIP5 climate models for future climate (2030 & 2050; RCP4.5/8.5) for meteorological variables (Tmean, RH, Ws, Rs), per month, for city of Rome	Ascii	KU Leuven	Patrick Willems patrick.willems@kuleuven.be	https://dataplatform.climate-fit.city/	No
Rainfall IDF curves and design storms for historical and future (2030,2050,2100) climate conditions, for city of Antwerp	Ascii	KU Leuven	Patrick Willems patrick.willems@kuleuven.be	On request	No
Rainfall IDF curves and design storms for historical and future (2030,2050,2100) climate conditions, for city of Tirana	Ascii	KU Leuven	Patrick Willems patrick.willems@kuleuven.be	On request	No

Variables: T (air temperature), Td (dew point temperature), RH (relative humidity), Ws (wind speed), Wdir (wind direction from the north), Pr (precipitation amount), Rs (downwelling short-wave radiation), Snow (snowfall amount) and WBGT (Wet Bulb Globe Temperature).

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

Table 12: Overview of the datasets generated for the Replication cases

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
Hourly 250m resolution historical (1987-2016) meteorological variables (T, RH) from the UrbClim model, based on ERA-Interim input data, for the city of London.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Hourly 250m resolution future (2011-2100) meteorological variables (T) from the UrbClim model, based on RCP4.5/8.5, for the city of London.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Percentiles (1 to 100%) of changes, based on CMIP5 climate models for future climate (2025, 2055 & 2085; RCP4.5/8.5) for meteorological variables (Tmean, Tmin, Tmax, RH, Ws, Rs), per month, for city of London	Ascii	KU Leuven	Patrick Willems patrick.willems@kuleuven.be	https://dataplatform.climate-fit.city/	No
Hourly 100m resolution historical (2000-2018) meteorological variables (T, RH, Ws, Wdir, Pr, Rs, WBGT) from the UrbClim model, based on ERA5 input data, for the city of Berlin and Bremen.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Hourly 100m resolution future (2021-2039 and 2041-2059) meteorological variables (T, RH, Ws, WBGT) from the UrbClim model, based on RCP4.5/8.5, for the city of Berlin and Bremen.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Percentiles (1 to 100%) of changes, based on CMIP5 climate models for future climate (2030 & 2050; RCP4.5/8.5) for meteorological variables (Tmean, Tmin, Tmax, RH, Ws, Rs, Rs), per month, for city of Berlin and Bremen	Ascii	KU Leuven	Patrick Willems patrick.willems@kuleuven.be	https://dataplatform.climate-fit.city/	No
Hourly 100m resolution historical (2000-2017) meteorological variables (T, RH, Ws) from the UrbClim model, based on ERA5 input data, for	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

Description	Format	Owner/responsible	Contact	Accessibility	Restrictions for further use
the city of Antwerp and Mechelen.					
Hourly 100m resolution future (2016-2025; 2026-2035; 2036-2045 and 2046-2055) meteorological variables (T, RH, Ws) from the UrbClim model, based on RCP4.5/8.5, for the city of Antwerp and Mechelen.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No
Percentiles (1 to 100%) of changes, based on CMIP5 climate models for future climate (2020, 2030, 2040 & 2050; RCP4.5/8.5) for meteorological variables (Tmean, Tmin, Tmax, RH, Ws, Rs, Rs), per month, for city of Antwerp and Mechelen	Ascii	KU Leuven	Patrick Willems patrick.willems@kuleuven.be	https://dataplatform.climate-fit.city/	No
Hourly 100m resolution historical (2009-2018) meteorological variables (T, RH, Ws) from the UrbClim model, based on ERA5 data, for the city of Dhaka.	Netcdf	VITO	Dirk Lauwaet dirk.lauwaet@vito.be	https://dataplatform.climate-fit.city/	No

Variables: T (air temperature), Td (dew point temperature), RH (relative humidity), Ws (wind speed), Wdir (wind direction from the north), Pr (precipitation amount), Rs (downwelling short-wave radiation), Snow (snowfall amount) and WBGT (Wet Bulb Globe Temperature).

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

2. Findable, accessible, Interoperable, reusable (FAIR) data

2.1. Making data findable, including provisions for metadata

The generic urban climate data that are produced in the Climate-fit.city project are made available through the VITO-hosted urban climate data platform (https://dataplatform.climate-fit.city/). The model data are in Netcdf format, where versioning is included in the Netcdf metadata.

2.2. Making data openly accessible

The generic urban climate data (UrbClim model output and climate statistics) are fully and openly available through the urban climate data platform (https://dataplatform.climate-fit.city/). Overview maps are made for all variables, time horizons and emission scenarios for each city (in GIS raster geotiff format), which can directly be downloaded from the platform. Also the climate statistics for each city (in MS Excel format) are directly downloadable. The raw model output data (in Netcdf format) can be retrieved from the platform via FTP protocol.

The sectoral climate information (in varied formats) can be retrieved through the links and contacts in this document.

2.3. Making data interoperable

All data are interoperable, by using standard scientific data formats (Geotiff, Netcdf) and standard commercial data formats (e.g., MS Excel).

2.4. Increase data re-use

The basic urban climate data employ an Open Definition license (opendefinition.org) and can be re-used freely. Sectoral climate data generated in the project may be subject to more restricted licensing and access schemes. Data that serve as a basis for scientific publications will be embargoed until the actual publication is released. The basic urban climate data are deemed the most useable by third parties, including after the end of the project. Some of the sectoral climate data may be less useable by third parties as they are specifically being developed for the end-users that participate in the project, and tailored to their particular needs. In principle, the data will remain re-usable indefinitely, though in practice the expected evolution of the state of the art will make most of the data obsolete after some years.

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

3. Allocation of resources

We cover the costs of making the data FAIR and open through the budget of the H2020 project grant. The project co-ordinator (VITO) is the main responsible, and the partners are each responsible for the sectoral data they contribute.

4. Data security

VITO houses 2 data centers on its site in Mol. These data centers consists of rack-mounted hardware and is build according to the cold corridor concept for optimal cooling. Hardware-level security is provided through access control, fire and smoke detection systems containing an automatic fire extinguishing based a non-hazardous gas extinguishing system. In terms of power supply, uninterruptable power supplies (UPS) are foreseen as backup for short term electrical interruptions.

For the Climate-fit.city project a high-performance storage system is in place. Through this system we have the necessary storage capacity available which is very efficient and fail-safe. Fail-safe means that all components within this closed system have been doubled so that if any component fails, an identical component takes over the function. This happens without the global functionality being compromised. This allows these devices to offer a guarantee that they will continue to function and that no data will be lost if certain hardware components fail.

Although our storage system is provided with the necessary security features, all data remains captured within one system. If this system fails due to force majeure, all data could be lost. Therefore a back-up solution is in place for our infrastructure. This backup system is based on different hardware and technology and stores snapshots of the high-performance storage system in a backup schedule (for the current week a snapshot is stored every day, for the current month every week, for the current year every month).

For a third tier, data can be written to LTO tape storage and stored in an enclosed space. This way data can be retained over several years without further maintenance cost.

5. Ethical aspects

There are no ethical or legal issues with all the datasets that are listed in this report, that could hinder data sharing.

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004

°Climate -fit.city

Experience the benefits of climate services

PUCS has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 730004