



PARIS REINFORCE



PARIS
REINFORCE

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D8.6 DATA MANAGEMENT PLAN

WP8 – Communication, Dissemination & Exploitation

Version: 1.00



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EC Summary Requirements

1. Changes with respect to the DoA

No changes with respect to the work described in the DoA.

2. Dissemination and uptake

This report analyses the procedures for data collection, processing, production, and storage within the H2020 PARIS REINFORCE project. Thus, it will enable project partners to make the aforementioned data Findable, Accessible, Interoperable, and Reusable (FAIR). Moreover, it may be used by any other party interested in data management within the Open data research pilot of the Horizon 2020 programme.

3. Short summary of results (<250 words)

This report is the first version of the PARIS REINFORCE Data Management Plan (DMP). It outlines the procedures that will be applied regarding the collection, processing, production, and storage of research data within the project. More specifically the DMP includes information regarding the following questions: (i) how research data will be handled during and after the end of the project; (ii) what data will be collected, processed and/or generated; (iii) which methodology and standards will be applied; (iv) whether data will be shared/made open access; and (v) how data will be curated and preserved (including after the end of the project). The ultimate purpose of the DMP is to ensure that the research data produced by PARIS REINFORCE as well as the data on which the project's results are based on are Findable, Accessible, Interoperable, and Reusable (FAIR). In order to be up-to-date, the DMP will be considered as a "living document" and will be revised over the course of the project whenever significant changes arise, such as: new data; changes in consortium policies (e.g. new innovation potential, decision to file for a patent, etc.); changes in consortium composition and external factors (e.g. new consortium members joining or old members leaving). Moreover, the updated versions of the DMP are scheduled to be submitted in the middle (M18 - November 2020) and the end (M36 - May 2022) of the project.









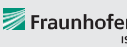









4. Evidence of accomplishment

This report.



Preface

PARIS REINFORCE will develop a novel, demand-driven, IAM-oriented assessment framework for effectively supporting the design and assessment of climate policies in the European Union as well as in other major emitters and selected less emitting countries, in respect to the Paris Agreement. By engaging policymakers and scientists/modellers, PARIS REINFORCE will create the open-access and transparent data exchange platform ¹PARIS, in order to support the effective implementation of Nationally Determined Contributions, the preparation of future action pledges, the development of 2050 decarbonisation strategies, and the reinforcement of the 2023 Global Stocktake. Finally, PARIS REINFORCE will introduce innovative integrative processes, in which IAMs are further coupled with well-established methodological frameworks, in order to improve the robustness of modelling outcomes against different types of uncertainties.

NTUA - National Technical University of Athens	GR	
BC3 - Basque Centre for Climate Change	ES	
Bruegel - Bruegel AISBL	BE	
Cambridge - University of Cambridge	UK	
CICERO - Cicero Senter Klimaforskning Stiftelse	NO	
CMCC - Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici	IT	
E4SMA - Energy Engineering Economic Environment Systems Modeling and Analysis	IT	
EPFL - École polytechnique fédérale de Lausanne	CH	
Fraunhofer ISI - Fraunhofer Institute for Systems and Innovation Research	DE	
Grantham - Imperial College of Science Technology and Medicine - Grantham Institute	UK	
HOLISTIC - Holistic P.C.	GR	
IEECP - Institute for European Energy and Climate Policy Stichting	NL	
SEURECO - Société Européenne d'Economie SARL	FR	
CDS/UnB - Centre for Sustainable Development of the University of Brasilia	BR	
CUP - China University of Petroleum-Beijing	CN	
IEF-RAS - Institute of Economic Forecasting - Russian Academy of Sciences	RU	
IGES - Institute for Global Environmental Strategies	JP	
TERI - The Energy and Resources Institute	IN	



Executive Summary

This report is the first version of the PARIS REINFORCE Data Management Plan (DMP). It outlines the procedures that will be applied regarding the collection, processing, production, and storage of research data within the project. More specifically, the DMP includes information regarding the following questions: (i) how research data will be handled during and after the end of the project; (ii) what data will be collected, processed and/or generated; (iii) which methodology and standards will be applied; (iv) whether data will be shared/made open access; and (v) how data will be curated and preserved (including after the end of the project).



Contents

1	Introduction	7
2	Data Summary	8
2.1	Purpose of the data collection/generation and its relation to the objectives of the project	8
2.2	Types and formats of data to be generated/collected	8
2.2.1	Data Processing Tools (Models & Methodologies) used within PARIS REINFORCE	8
2.2.2	Data used as input for the models & the robustification toolbox	9
2.2.3	Created Data, Policy Recommendations	11
2.3	Re-use of existing data	12
2.4	Origin of the data	18
2.5	Expected size of the data	18
2.6	Data utility	18
3	FAIR Data	19
3.1	Making Data Findable	19
3.2	Making Data Openly Accessible	19
3.2.1	Data envisaged to be distributed in open access	19
3.2.2	Ways to ensure open access	20
3.3	Making Data Interoperable	20
3.4	Making Data Reusable	20
4	Allocation of Resources	21
5	Data Security	22
6	Ethical Aspects	23
	Bibliography	24

Table of Tables

Table 1: Models used in PARIS REINFORCE	9
Table 2: Input Data to Models and Robustification Methodologies (non-exhaustive list)	10
Table 3: Considered Policy Options	11
Table 4: Existing data sources to be used in models	12
Table 5: Confidential data/reports & respective reason	19
Table 6: Open Access Options	21



1 Introduction

This report is the first version of the PARIS REINFORCE Data Management Plan (DMP). It outlines the procedures that will be applied regarding the collection, processing, production, and storage of research data within the project. More specifically the DMP includes information regarding the following questions: (i) the handling of research data during and after the end of the project; (ii) what data will be collected, processed and/or generated; (iii) which methodology and standards will be applied; (iv) whether data will be shared/made open access; and (v) how data will be curated and preserved (including after the end of the project).

The ultimate purpose of the DMP is to ensure that the research data produced by PARIS REINFORCE as well as the data on which the project's results are based on are Findable, Accessible, Interoperable, and Reusable (FAIR).

In order to be up-to-date the DMP will be considered as a "living document" and will be revised over the course of the project whenever significant changes arise, such as: new data; changes in consortium policies (e.g. new innovation potential, decision to file for a patent, etc.); changes in consortium composition and external factors (e.g. new consortium members joining or old members leaving). Moreover, the updated versions of the DMP will be submitted in the middle (M18 - November 2020) and the end (M36 - May 2022) of the project.



2 Data Summary

2.1 Purpose of the data collection/generation and its relation to the objectives of the project

The main objective of PARIS REINFORCE is to support evidence-based climate policy formulation for low-carbon transitions in the context of the Paris Agreement. Such approach will result in a lot of research data being collected and processed, at the various stages of the project, that shall all be stored.

PARIS REINFORCE will develop a novel, demand-driven, IAM-oriented assessment framework for effectively supporting the design and assessment of climate policies in the European Union as well as in other major emitters and selected less emitting countries, in respect to the Paris Agreement. This assessment framework will be applied through the use of the I²AM PARIS platform which will be an open-access and transparent data exchange platform supporting the effective update and subsequent implementation of Nationally Determined Contributions, the preparation of future action pledges, the development of 2050 decarbonisation strategies, and the reinforcement of the 2023 Global Stocktake. These activities will generate vast amounts of data that require a logically structured, transparently accessible data management system.

2.2 Types and formats of data to be generated/collected

As previously described, within PARIS REINFORCE several data will be gathered in order to (i) develop an IAM-based assessment framework; (ii) co-create the I²AM PARIS platform; and (iii) produce climate policies supporting the achievement of the goals of the Paris Agreement. Towards the implementation of these outcomes, three main types of data will be gathered/generated. First, the data collected via stakeholder engagement; second, the already available data that will be extracted from appropriate databases; and, last but not least, the data that will be generated via the models and by post-processing model results. The data will be available in one or more of the following formats: .pdf, .docx, .xlsx, .csv, .txt, .mp3, .mp4.

The following sections present the models used in the project, the data required by the models, and the policy options to be analysed and assessed.

2.2.1 Data Processing Tools (Models & Methodologies) used within PARIS REINFORCE

Within PARIS REINFORCE, a total of twenty-two models are expected to be used in the production of climate policies. In particular, five national or regional models will be applied for analyses in European countries and Europe (or the EU) as a whole; nine national or regional models will be used to analyse selected countries outside Europe; and eight global models will be applied to identify policy-related implications at the global level (but will also be used for national and regional analyses in countries of interest, for which they feature the required geographic granularity).

The models to be used in the processing of the data in order to develop decarbonisation policies are presented in the following table.



Table 1: Models used in PARIS REINFORCE

Global Models ¹	National/Regional Models (Europe) ²	National/Regional Models (outside Europe) ³
GCAM https://github.com/JGCRI/gcam-core	ALADIN https://www.aladin-model.eu/	CONTO
TIAM http://bit.ly/2JziuFe	NEMESIS https://frama.link/r_Upbulb	MARKAL-India
MUSE http://bit.ly/2NpY42F	FORECAST http://www.forecast-model.eu/	MAPLE
42	LEAP https://frama.link/rTynpKFy	GCAM-China
GEMINI-E3 https://www.epfl.ch/labs/gemini-e3/	JRC-EU-TIMES https://frama.link/hunjKQmf	GCAM-SOUSEI
ICES https://www.icesmodel.org/		GCAM-USA https://jgcri.github.io/gcam-doc/gcam-usa.html
E3ME https://www.e3me.com/		NATEM
DICE http://bit.ly/2MWL8Ca		SISGEMA
		TIMES-CAC

Apart from the models outlined above, a series of robustification techniques and tools will be applied in order to understand, assess, and reduce associated uncertainties that may be present in the created policy recommendations. As PARIS REINFORCE will progress and the use of these methodologies become clearer, the DMP will be updated to present more precisely the data involved in the process.

2.2.2 Data used as input for the models & the robustification toolbox

The development of climate policies will be based on accurate data that may be divided in three categories: (i) stakeholder-generated data; (ii) already available data; and (iii) real life policy/impact observations. The former will be collected via the stakeholder consultation process, which will consist among others of bilateral interviews, focus groups, workshops, etc., as described in the PARIS REINFORCE report “D3.1 Stakeholder engagement plan”. The second category will be populated by exploiting existing databases. These are shown in more detail in the relevant section of this report “2.3 Re-use of existing data”. The final category will be obtained from literature review and monitoring of current affairs. All data in the aforementioned three categories will be used either in the creation of the policies, or in their validation.

Table 2 presents the main data types that will be used as inputs to the entire PARIS REINFORCE modelling ensemble and the applied robustification methodologies.

¹ As described in PARIS REINFORCE report D7.1 Documentation of Global IAMs

² As described in PARIS REINFORCE report D5.1 Documentation of national/regional level models for Europe

³ As described in PARIS REINFORCE report D6.1 Documentation of national/regional models for countries outside Europe



Table 2: Input Data to Models and Robustification Methodologies (non-exhaustive list)

Input Data to Models		
Socio-economic related data		
GDP	Public debt	Number of households
Private consumption or households' disposable income	Population	Households size
Demand in transports services (passenger-kms, tonne-kms)	Population by age groups and educational attainment level	Interest rates
Gross value added	Energy markets in physical units	Sectoral economic activity growth (agriculture, etc.)
Sectoral production growth	Physical production growth in the industrial sectors	Indirect taxation
Labour participation and productivity	International sectoral statistics	Detailed social accounting matrices
Government expenditures	International transactions among governments and transactions/flows between government and private households	Number of employees in service sectors and industry
Square meter per employee in service sector		
Energy technology data		
Fossil fuel proven/possible reserves (mainly oil and gas) and expected production rates	Information about under construction/planned/possible energy projects/infrastructures	Policies (emissions constraints, renewable portfolio standards, regional emissions reduction goals, etc.)
Energy efficiency improvements rates	Fuel efficiency for electricity and heat plants	Transport infrastructures (charging)
Structure of electricity and heat production	Exchanges rates	Fuel efficiency for cars and trucks
Sectoral energy intensities	Industrial production for energy-intensive industry sectors	Technology characterisation
Power generation technology specification	Degree to which energy demand and demand for other goods and services resulting in GHG emissions change over the time horizon	Agricultural technology crop yields, costs, carbon contents, water requirements, fertiliser requirements
Resources (fossil fuels, wind, solar, uranium and groundwater)	Overall savings rate for physical capital	Vehicle fleet and structure

Input Data to Models		
Drivers profiles (including trips purpose, length of route, departure and arrival time, etc.);		
Price data		
Cost of drive technologies (battery electric vehicles -BEV, range-extended vehicles - REEV, plug-in hybrids - PHEV, etc.)	Energy efficiency improvements costs/limits (from the supply side to the demand side)	Fuel prices
Biomass prices	Fossil fuels prices	Fossil energy prices
End-consumer energy prices (electricity, coal, oil, natural gas, biomass, district heating)	Renewable energy and CCS costs/potentials	Economic flows related to fuel-specific energy production and consumption
Technology availability and costs	Energy technology costs, performance, water requirements	

2.2.3 Created Data, Policy Recommendations

The policies recommended by PARIS REINFORCE will be formulated from data derived from the models after the consideration of several policy options that will be explored, and the application of the robustification methodologies. The mainly considered policy options are presented in the following table.

Table 3: Considered Policy Options

Policy Options considered in the Modelling		
The emissions targets or constraints consistent with different regions' contributions to different long-term, Paris-compliant temperature goals (i.e. well below 2°C, 1.5°C);	Emissions financial supports;	Carbon border supports on exports;
The mix of policies that can be implemented to aim to achieve these emissions targets;	Energy tax;	Trade regulations policies;
The interactions of different resulting mitigation pathways with other policy goals, in particular the sustainable development goals (SDGs) and adaptation goals;	Energy subsidies;	Standards (building, fuel economy, etc.)
Emissions tax (carbon tax / carbon price);	Energy mix target;	Investment in the construction of cross-national new pipelines;
Emissions target / quota (annual);	Energy efficiency target;	Maintenance of free exchange in the energy sector across the region;



Policy Options considered in the Modelling		
Emissions target / quota (cumulative);	Energy & Energy efficiency regulations;	Creation of regional joint CO ₂ emission permit systems;
Synthetic fuel production	Carbon sink pricing;	Land use change emissions tax;
Behavioural changes	Emissions regulations;	Afforestation targets;
Building technologies	Hydrogen production	Carbon border tax on imports;
Financial supports	Coal and biomass to liquids production	Carbon capture and storage/sequestration (CCS)

2.3 Re-use of existing data

In order to increase research efficiency and avoid waste of resources, data from already existing and reliable sources will be exploited. In particular, reputable databases such as the World Bank's Databank⁴, EUROSTAT's database⁵, etc. will be used among others.

The following table concentrates the existing data sources that is envisaged to be utilised.

Table 4: Existing data sources to be used in models

Data Sources used in Models	Purpose / Data	Publicly Accessible (P) or Restricted Access/Subscription Fee (SF)	Model(s) using the Source
REM2030-Fahrprofile	Driving profiles of vehicles		ALADIN
Mobility Panel	Driving profiles of vehicles		ALADIN
KiD 2010 vehicle survey for Germany	Driving date for medium and heavy-duty vehicles		ALADIN
EUROSTAT	Vehicles transport performance and annual mileage data; socioeconomic data: National accounts (GDP, private consumption, GFCF, production, value added, etc...), interest rates, exchange rates, population, population projection (EUROPOP), labour force survey, energy quantities and prices, etc.		ALADIN, JRC-EU-TIMES, NEMESIS
National Statistical Authorities databases (Russian Federal State Statistics Service, China's energy statistical yearbook 2006-2011, national Chinese data sources, etc.)	Same as EUROSTAT		CONTO, CHINA-MAPLE
UN's System of National Accounts	Same as EUROSTAT		CONTO

⁴ <https://databank.worldbank.org/home.aspx>

⁵ <https://ec.europa.eu/eurostat/data/database>



Data Sources used in Models	Purpose / Data	Publicly Accessible (P) or Restricted Access/Subscription Fee (SF)	Model(s) using the Source
United Nations (United Nations 2018)	ASDI indicators for ICES base year (2007)		ICES
United Nations (United Nations 2019)	Population growth in GEMINI-E3	P	GEMINI-E3
World Income Inequality Database (WIID3.4), United Nations 2017	ASDI indicators for ICES base year (2007)		ICES
Buildings Performance Institute Europe (BPIE)	Technology-related data not available in EUROSTAT		FORECAST
TABULA IEE project	Technology-related data not available in EUROSTAT		FORECAST
IEA Building Energy Efficiency Policies (BEEP)	Technology-related data not available in EUROSTAT		FORECAST
IEA Energy Balances (1990-2016)	Energy production and consumption; ICES: ASDI indicators for base year (2007) and historical calibration in the baseline; Calibration of 42 (depending on the country/region)		JRC-EU-TIMES, TIMES-CAC, TIAM, ICES, 42
IEA world energy statistics (year 2005)	Calibration of TIAM		TIAM
IEA world energy statistics (year 2010)	Calibration of MUSE		MUSE
IEA world energy statistics (year 2012)	Calibration of TIAM (projections for energy, installed technology capacity and emissions)		GCAM-CHINA, GCAM-SOUSEI, GCAM-USA, GCAM, TIAM
IEA world energy statistics (year 2015)	Calibration of TIAM (potentially); Calibration of MUSE (projections for energy, installed technology capacity and emissions); Calibration of NEMESIS (prices and taxes)		NEMESIS, TIMES-CAC, TIAM,
IEA World Energy Outlook (2018)	Economic growth and international energy prices in GEMINI-E3; Calibration of TIAM to post-2015	SF	TIMES-CAC, TIAM, GEMINI-E3
GTAP 8 database	Energy volumes, CO2 and non-CO2 emissions, fluorinated gases, and National social accounting matrices for behavioural equations in ICES	P	ICES
GTAP-Power database	Economic flows related to fuel-specific energy production and consumption in ICES	SF	ICES
GTAP-10 database	Calibration of GEMINI-E3	SF	GEMINI-E3



Data Sources used in Models	Purpose / Data	Publicly Accessible (P) or Restricted Access/Subscription Fee (SF)	Model(s) using the Source
GTAP Non-CO2 GHG emissions (NCGG) dataset	Representation of non-CO2 emissions in GEMINI-E3	SF	GEMINI-E3
EPA abatement curves (EPA 2013)	Calibration of GCAM models		GCAM-CHINA, GCAM-SOUSEI, GCAM-USA, GCAM
EPA abatement curves (EPA 2019)	Computation of abatements by gases in GEMINI-E3	P	GEMINI-E3
OECD	Calibration of GEMINI-E3 (specific data i.e. indirect taxation and government expenditures); Calibration of NEMESIS (complementary to Eurostat) and long-term projection of GDP in non-EU countries	P	NEMESIS, GEMINI-E3
International Monetary Fund (IMF)	Calibration of GEMINI-E3 (specific data i.e. indirect taxation and government expenditures); ICES: ASDI indicator on Public Debt (2007); NEMESIS: short-medium term GDP projections for non-EU countries	P	NEMESIS, GEMINI-E3, ICES
World Bank 2012			CHINA-MAPLE
World Development Indicators (World Bank 2016)	Indicators on R&D expenditure over GDP, private and public health expenditure and total education expenditure (for the year 2007)		TIMES-CAC, ICES
World Development Indicators (World Bank 2018)	Population and employment trend for ICES baseline (from 2017 to 2015); ASDI indicators for ICES base year (2007)		ICES
OECD Main Science and Technology Indicators (OECD 2016)	Attributing R&D to the different economic agents in ICES via the indicator “share of R&D financed by Government, Firms, Foreign Investment and Other National”		ICES
EPISCOPE IEE project			FORECAST
ODYSSEE database			FORECAST
Ecodesign Directive preparatory studies			FORECAST
Individual technology studies	Heating and cooling technologies, hydrogen, storage		JRC-EU-TIMES
GfK	Market research data		FORECAST
World Steel Association	Market research data		FORECAST



Data Sources used in Models	Purpose / Data	Publicly Accessible (P) or Restricted Access/Subscription Fee (SF)	Model(s) using the Source
CEPI	Market research data, NEMESIS: alternative to OECD long-term GDP projections for non-EU countries		FORECAST, NEMESIS
Cembureau	Market research data		FORECAST
Eurochlor	Market research data	P	FORECAST, JRC-EU-TIMES
Other industry organisations	Market research data		FORECAST
US Geological Survey		P	JRC-EU-TIMES
UNFCCC			FORECAST
UN commodity production database			FORECAST
PRODCOM			FORECAST
IPPC BREF studies			FORECAST
IPCC Shared Socioeconomic Pathways (SSPs)	NEMESIS for population qualification projections (and potentially in PR for GDP and population)		NEMESIS, GCAM-CHINA, GCAM-SOUSEI, GCAM-USA, GCAM
EU Energy Roadmap 2050 reference scenario	Potential calibration of NEMESIS to nuclear and hydro PG share in electricity mix and exogeneous energy efficiency		NEMESIS
European Environment Agency - EEA 2019			NEMESIS
DG TAXUD 2019			NEMESIS
World Input-Output Database (WIOD) 2016	NEMESIS: to complete EUROSTAT (imports and exports)		NEMESIS
FAOSTAT balances	Food demand, agriculture		GCAM-CHINA, GCAM-SOUSEI, GCAM-USA, GCAM
EIA (2014)	State Energy Data System		GCAM-USA
U.S. Census Bureau			GCAM-USA
Energy Balance Sheet			CHINA-MAPLE
Industrial Statistics Yearbook			CHINA-MAPLE



Data Sources used in Models	Purpose / Data	Publicly Accessible (P) or Restricted Access/Subscription Fee (SF)	Model(s) using the Source
Industrial Statistical Yearbook 2010-2013			CHINA-MAPLE, TIMES-CAC
China Steel Statistics 2011			CHINA-MAPLE
China Chemical Industry Yearbook			CHINA-MAPLE
China Nonferrous Metals Industry Yearbook			CHINA-MAPLE
China Energy Statistical Yearbook 2006-2013			CHINA-MAPLE
China's Medium and Long-Term Development Strategy on Traffic and Transportation			CHINA-MAPLE
Automotive Energy Outlook 2012			CHINA-MAPLE
China Transport Yearbook			CHINA-MAPLE
China Bulletin on Motor Vehicles Pollution Prevention			CHINA-MAPLE
The Annual Development and Research Report on Building Energy Efficiency in China (2008-2013)			CHINA-MAPLE
Energy Supply and Demand Projections to 2040. National Energy Board (NEB) - Canada	Driver projections, energy trade and electricity generation, Canada	P	NATEM
Trottier Energy Futures Project (TEPF, 2016). Trottier Energy Institute.	Model structure and assumptions, Canada	P	NATEM
Annual Energy Outlook Database. Energy Information Administration (EIA) - United States	Drivers and energy projections, electricity generation, technology stocks and techno-economic attributes, various data, USA	P	NATEM
Proyecciones de la Población 2010-2050. Consejo Nacional de Poblacion (CONAPO) - Mexico	Driver projections, Mexico	P	NATEM
Prospectiva de Energía Renovable 2014 - 2028. Secretariat de Energia (SENER), Mexico	Renewable energy projections, Mexico	P	NATEM



Data Sources used in Models	Purpose / Data	Publicly Accessible (P) or Restricted Access/Subscription Fee (SF)	Model(s) using the Source
PRODESEN - Programme de Desarrollo des Sistema Electrico Nacional - Mexico	Energy projections, electricity generation, various data, Mexico	P	NATEM
Report on Energy Supply-Demand in Canada. Statistics Canada	Regional energy balances, Canada	P	NATEM
Numerous technology/sectoral studies			FORECAST
A diverse database included in the LEAP model	GHG emissions of energy and non-energy sectors		LEAP
The Technology and Environmental Database (TED)			LEAP
ENTRANZE Database	Dwelling stock characterisation, Characterisation of retrofit measures	P	JRC-EU-TIMES
JRC-IDEES Database	Disaggregated energy balances by energy service, technology efficiencies, load factors for dispatchable electricity generation	P	JRC-EU-TIMES
EMISIA TRACCS Database	Vehicle stocks, Fuel consumption, Average occupancy/tonnage, Average efficiency in road transport	P	JRC-EU-TIMES
ETRI Database	Energy Technology Reference Indicators	P	JRC-EU-TIMES
ENSPRESO Database	Wind, solar and biomass energy potentials	P	JRC-EU-TIMES
EMHRES (European Meteorological derived High Resolution RES) Database	Parametrisation of variable RES	P	JRC-EU-TIMES
EU Reference scenario 2016	Demand projections	P	JRC-EU-TIMES
FAO Aquastat database	Water resources, uses, withdrawals	P	JRC-EU-TIMES, TIMES-CAC
Country-Specific DB (Local - Central Asia)	Economic indicators, technology data, reserves, pipelines, etc.		TIMES-CAC
BP, Statistical Review of World Energy (Central Asia)	Reserves, production, trades		TIMES-CAC
WRI	GHG emissions for ASDI database (2007)		ICES
SSP database (IIASA)	Projections of GDP, population, employed population		ICES
AR5 emission scenario (IIASA)	emission projections		ICES
GMWD SERI/WU Global Material Flows Database	Material flow for ASDI database (2007)		ICES



Data Sources used in Models	Purpose / Data	Publicly Accessible (P) or Restricted Access/Subscription Fee (SF)	Model(s) using the Source
Comprehensive Energy Use Database. Office of Energy Efficiency, Natural Resources Canada (RNCAN)	Energy consumption data, Canada	P	NATEM
National Inventory Report. Environment and Climate Change Canada (ECCC)	GHG inventory and methodology, Canada	P	NATEM
Global Power Plant Database.	Electricity capacity by plant, Worldwide	P	NATEM
FIGARO (Eurostat, experimental statistics)	Calibration of NEMESIS (potentially)		NEMESIS
The 2018 Ageing Report: Economic and Budgetary Projections for the EU Member States (2016-2070)	Calibration of NEMESIS (potentially - EU GDP and population projections)		NEMESIS
OECD/ITF. ITF Transport Outlook 2017	Transportation data for TIAM		TIAM
Global Energy Assessment - GEA (2012)	Energy end-use in transport and buildings for TIAM V4		TIAM

2.4 Origin of the data

The data used in the project will be either gathered directly via stakeholder engagement (i.e. experts' opinions, knowledge, insights, question-driven scenarios, etc.) or via already existing databases and statistical data as described in the previous section. Stakeholder engagement will be implemented via interviews, small meetings and focus groups, online surveys, as well as regional and national workshops.

2.5 Expected size of the data

The data expected to be collected, processed, and produced within PARIS REINFORCE are around 25GB.

It must be noted that this figure is a rough estimate and a more accurate number will be available with the progress of the project.

2.6 Data utility

Although the produced data would be useful to many stakeholder groups, it is believed that policymakers and scientists are the ones to utilise them the most. Other potential users of the data are academics, industry representatives, NGOs, financial institutions, and civil society.



3 FAIR Data

3.1 Making Data Findable

In order to ensure that data are easily findable in a consistent way, all data will be associated with a persistent digital object identifier and will be described with rich metadata. In the case of scientific publications, DOIs will be provided from the publisher, while for other literature (e.g. reports, policy recommendations, etc.) DOIs will be assigned via the repository in which they will be archived (e.g. Zenodo). The metadata complimenting the data will be in compliance with DataCite's Metadata Schema⁶.

As described in "D1.1 Quality Management Plan", a clear naming and versioning system has been established for the identification of the following project documents:

- Deliverables
- Project/WP Meetings agendas and minutes
- Project events agendas
- Official reports to the EC
- Documents, such as mailing lists and internal effort reporting, which are regularly updated
- Documents used for internal project management and monitoring purposes
- Materials/Publications produced by the project, such as commentaries, policy briefs, working documents, presentations, newsletters

Moreover, each document will be accompanied with adequate keywords (e.g. Data, Data Management, FAIR Data, Data Processing, etc.) so that potential users are supported in searching and retrieving the document that they are interested in.

3.2 Making Data Openly Accessible

3.2.1 Data envisaged to be distributed in open access

All reports and data that are not confidential will be licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0)⁷. Exceptions to this rule may apply if needed (e.g. conflict of IPRs, desire to exploit the project's results, etc.). Currently the only exceptions are the reports shown in the following table.

Table 5: Confidential data/reports & respective reason

Non-Open access data / report	Reason for exception
D4.2 First portfolio analysis of technological and policy mixes	Scientific publication potential
D4.5 Index decomposition analysis and sectoral benchmarking of IAM scenarios	Scientific publication potential
D4.7 Transformative policy mixes: comparing national case studies	Scientific publication potential
D5.3 Global pathways & EU response: A 1 st European Regional, National and Sectoral assessment	Scientific publication potential
D5.4 Study on EU climate policy, SDGs and the EU policy framework	Scientific publication potential

⁶ <https://schema.datacite.org/>

⁷ <https://creativecommons.org/licenses/by/4.0/>



D6.3 First round of nationally modelled low-carbon pathways outputs	Scientific publication potential
D6.4 Ancillary impacts, including SDGs, of national low-carbon pathways outputs	Scientific publication potential
D6.5 Game-changing innovation across the globe	Scientific publication potential
D7.4 1 st Report on Model Inter-Comparisons: Informing scientific assessments and the GST	Scientific publication potential
D9.1 H - POPD - Requirement No. 1	Need for confidentiality in connection with security issues
D9.2 POPD - Requirement No. 3	Need for confidentiality in connection with security issues
D9.3 GEN - Requirement No. 4	Need for confidentiality in connection with security issues
D9.4 GEN - Requirement No. 6	Need for confidentiality in connection with security issues
D9.5 POPD - Requirement No. 5	Need for confidentiality in connection with security issues

The aforementioned reports will have restricted access since their dissemination level is confidential. It is worth mentioning that, as previously stated, the DMP is a living document and if further exceptions are decided for significant reasons it will be updated to reflect these changes.

3.2.2 Ways to ensure open access

The data that will be provided in open access will be initially available via the I²AM PARIS open access exchange platform, and/or deposited in an appropriate repository, e.g. Zenodo, in order to ensure that they are available to all interested parties. As mentioned before, the data will be in well-known formats, namely .pdf, .docx, .xlsx, .csv, .txt, .mp3, .mp4. Several programs capable to open these file formats are distributed freely.

3.3 Making Data Interoperable

Interoperability of provided data will be ensured by depositing in a repository that uses appropriate data and metadata vocabularies. The most probable solution is to use the Zenodo repository, which uses JSON Schema as internal representation of metadata and offers export to other popular formats, such as Dublin Core or MARCXML.

3.4 Making Data Reusable

As already mentioned, all reports and data that are not confidential will be licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0). Most of the reports will be made available as soon as they are accepted by EASME. In case it is envisaged that scientific publications will be produced from certain data and/or reports, then an embargo period will be applied until the scientific publication has been accepted by the publisher.

After the publishing of data in open access they will be usable by third parties, and it is intended that the data remain re-usable for as long as possible.



4 Allocation of Resources

In order to ensure data accessibility and preservation, an appropriate, free of charge, repository will be used. Thus, the only necessary resources for making data FAIR will be the process of depositing the data in the repository, as well as any fees for publishing in open access (either gold or green). Both of these expenditures have already been budgeted in the PARIS REINFORCE Grant Agreement. IEECP and NTUA staff will be responsible for finding and depositing the data in an appropriate repository. Ideally, the cost of long-term preservation will be covered by the repository. According to the H2020 requirements open access must be ensured to all peer-reviewed scientific publications within a period of at most six months. The following table presents the available open access options.

Table 6: Open Access Options

Open Access Type	Definition	Options	Access	Fees	License
Gold Open Access	Providing free online access to the published scientific paper for any user.	Publish in an open access journal. Publish in a journal that supports open access.	Free to everyone.	Article Processing Charges (or APCs), ranging range between 130€ and 5,400€	CC BY 4.0 CC BY-NC-ND 4.0
Green Open Access	Depositing the published article or the final peer-reviewed manuscript in an online repository	Publishing in an embargo journal.	Free to everyone after an embargo period.	Fees may be required in order to achieve the embargo period of 6 months.	CC BY-NC-ND 4.0
		Self-archiving the final accepted manuscript in an appropriate repository (e.g. arXiv, RePEc, etc.)	Free to everyone immediately.	No fees required.	CC BY-NC-ND 4.0

5 Data Security

Within the project's lifetime, in order to enhance the effective collaboration among partners, data will be stored in a project-specific implementation of the Alfresco Community document management system. The Alfresco server used has full version control and a backup of previous versions (full backups rather than differential), as well as retaining a backup copy for every deleted or overwritten piece of content in its repository. This allows instant recovery of documents, through either the Alfresco interface or the administration interface. In addition, certain data produced by the models of the project will be stored in the I²AM PARIS platform, more information on which will be available in "D2.2 – Protocol for model use, scenarios and stakeholder engagement" (Month 7) and "D2.3 – I²AM PARIS platform" (Month 12, with updates in Months 24 and 36). Although the structure and more technical details of the platform have not been decided yet, it is certain that good practices of data storage and recovery will be applied in its design and development, while it is envisaged that the platform will be maintained for a period of at least five years after the end of the project.

The PARIS REINFORCE implementation of Alfresco is located on a Windows Server 2008 R2 Datacenter Hyper-V Virtual Machine, on a Dell Poweredge R710 Server owned by EPU-NTUA (Project Coordinator) and operated in the EPU-NTUA premises. Data redundancy on a server-wide scale is achieved by the use of four SAS 600GB hard disk drives on a RAID 10 configuration—this ensures that no data is lost if one drive fails. In addition, offsite backups of the server are taken on a weekly basis. More information about Alfresco can be found at the Alfresco website⁸.

After the project's end, the collected data will be stored in an appropriate repository so as to achieve data reservation. It is envisaged that data will be archived in the Zenodo repository, which is provided by CERN and has a lifespan of at least 20 more years. Moreover, even in case of closure of Zenodo, best efforts will be made by its staff to integrate all content into suitable alternative institutional and/or subject based repositories. According to Zenodo's policy, the data files are stored in the central server located in CERN Data Centres, Geneva, while two more replicas of a file located on different disk servers, in Budapest, are created. Thus, loss of data is highly improbable to occur. Regarding specific files, other repositories apart from Zenodo may be chosen in case they are more suitable to the file in question.

Finally, the outcomes of PARIS REINFORCE will be maintained in NTUA's servers for a period of at least ten years after the end of the project, thus further increasing data preservation.

⁸ <https://www.alfresco.com/solutions/document-management>



6 Ethical Aspects

Regarding the data already available in existing databases (see Section 2.4), there are no ethical aspects, apart from the respect of the licence under which these databases are provided, namely a database with restricted access cannot be available with open access even if PARIS REINFORCE has used it.

Regarding data gathered via stakeholder consultation (e.g. stakeholders' opinions, etc.) several ethical procedures apply in regards with data collection, handling, and further availability to the public. For the collection of the data, as described in "D9.1 H - POPD - REQUIREMENT No. 1", informed consent procedures have been established and appropriate templates have been created. Moreover, in case data gathered via stakeholder consultation is decided to be made public (e.g. if the data are used in an open access scientific publication), then suitable anonymisation techniques will be applied prior to the archiving of data.



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