

Package: reportbrick (via r-universe)

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Type Package

Title Reporting package for BRICK

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Description This package contains BRICK-specific routines to report model results. The main functionality is to generate a mif-file from a given BRICK model run folder.

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URL <https://github.com/pik-piam/reportbrick>

Imports dplyr, gamstransfer (>= 3.0.1), ggplot2, ggpubr, ggsankey, kableExtra, knitr, madrat, magclass, mip (>= 0.155.12), piamPlotComparison, piamutils (>= 0.0.9), purrr, rmarkdown, scales, stringr, tidyr, yaml

Suggests covr, testthat

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.addCarrierDimension Add carrier dimension based on heating system technology

Description

Add carrier dimension based on heating system technology

Usage

```
.addCarrierDimension(v_stock, hsCarrier)
```

Arguments

v_stock	MagPIE object, BRICK variable
hsCarrier	data.frame, mapping between heating technology and energy carrier

Value

MagPIE object with additional carrier dimension

Author(s)

Robin Hasse

.agg Aggregate

Description

Aggregate

Usage

```
.agg(x, agg, silent = TRUE)
```

Arguments

x	MagPIE object, BRICK object
agg	named vector of dimensions to aggregate.
silent	logical, suppress warnings and printing of dimension mapping

Value

aggregated MagPIE objects without sub dimensions in dim 3

.checkForDeviation	<i>Check if the tolerance is violated anywhere</i>
--------------------	--

Description

Check if the tolerance is violated anywhere

Usage

```
.checkForDeviation(stockBal, name, tol = 0.01)
```

Arguments

stockBal	data frame with evaluation of a stock balance equation
name	character, name/identifier of the stock balance equation
tol	numeric, tolerance to check the equation against

.combinations	<i>All Combinations of dimension elements</i>
---------------	---

Description

All Combinations of dimension elements

Usage

```
.combinations(lst)
```

Arguments

lst	names list of dimension entries
-----	---------------------------------

Value

character vector with all combinations of the dimension elements each separated by .

Author(s)

Robin Hasse

<code>.computeAvg</code>	<i>Compute the mean value in a data frame</i>
--------------------------	---

Description

Compute the mean value in a data frame

Usage

```
.computeAvg(df, rpvt = "", valueName = "value", exclude = list())
```

Arguments

<code>df</code>	data frame, containing the data to be evaluated
<code>rpvt</code>	character, column names for which the mean should be reported separately
<code>valueName</code>	character, name of the column containing the values to be manipulated
<code>exclude</code>	named list with entries to be excluded from the data. The name gives the column name from which the entries given by the value should be removed.

Value

data frame averages as value column

<code>.computeDeviation</code>	<i>Compute the deviation to target data</i>
--------------------------------	---

Description

Compute the deviation to target data

Usage

```
.computeDeviation(df, dfTarget)
```

Arguments

<code>df</code>	data frame, containing data from calibration run
<code>dfTarget</code>	data frame, containing historical data as calibration target

Value

data frame where the value column contains the deviation from target data

<code>.computeFlowSum</code>	<i>Compute the sum of construction and renovation flow values</i>
------------------------------	---

Description

Compute the sum of construction and renovation flow values

Usage

```
.computeFlowSum(flows, squareAndRoot = FALSE)
```

Arguments

<code>flows</code>	named list of data frames, each containing flow quantities. Entries need to include construction and at least one entry with renovation as part of the name.
<code>squareAndRoot</code>	logical, whether the square should be taken before summing and the root afterwards. This option should be active if we're summing up roots of summed squares.

Value

data frame with the sum in the value column

<code>.computeRatioSq</code>	<i>Compute the ratio of the squares for two data sets</i>
------------------------------	---

Description

Compute the ratio of the squares for two data sets

Usage

```
.computeRatioSq(dfx, dfy, addSign = TRUE)
```

Arguments

<code>dfx</code>	data frame containing the data of the nominator
<code>dfy</code>	data frame containing the data of the denominator
<code>addSign</code>	logical indicating whether a heuristic sign of the squares should be computed

Value

data frame with squared ratio

<code>.computeRelDev</code>	<i>Compute the relative deviation to calibration target data as the relative euclidean distance</i>
-----------------------------	---

Description

Compute the relative deviation to calibration target data as the relative euclidean distance

Usage

```
.computeRelDev(dfDev, dfTarget, tCalib, notInTargetGrp = NULL)
```

Arguments

<code>dfDev</code>	data frame, containing deviation between calibration result and target data
<code>dfTarget</code>	data frame or a list of one or two data frames, containing target data. The option to pass two data frames is used to combine construction and renovation flows. If two data frames are passed, the first one is assumed to be construction, the second renovation
<code>tCalib</code>	numerical/factor, calibration time periods to filter calibration target data
<code>notInTargetGrp</code>	character vector, pass columns that target data should not be grouped by when computing the sum of the squares, although they exist in the data

Value

data frame with relative deviation in value column

<code>.computeSum</code>	<i>Compute the sum</i>
--------------------------	------------------------

Description

Compute the sum

Usage

```
.computeSum(df, rpvt = "", exclude = list())
```

Arguments

<code>df</code>	data frame containing the data to be evaluated
<code>rpvt</code>	character, column names for which the sum should be reported separately
<code>exclude</code>	named list with entries to be excluded from the data. The name gives the column name from which the entries given by the value should be removed.

Value

data frame with summed values

<code>.computeSumSq</code>	<i>Compute the square root of the sum of the squares in a data frame</i>
----------------------------	--

Description

Compute the square root of the sum of the squares in a data frame

Usage

```
.computeSumSq(df, tCalib, rprt = "", addSign = TRUE)
```

Arguments

<code>df</code>	data frame, containing the data to be evaluated
<code>tCalib</code>	numeric, time periods the model was calibrated on
<code>rprt</code>	character, column names for which the sum of the squares should be reported separately
<code>addSign</code>	logical indicating whether the heuristic sign of the square should be computed

Value

data frame with the square root of the sum of squares as value column

<code>.constructDimMapping</code>	<i>Construct dimension mapping (either aggregation or reporting) with explicit set elements for each dimension</i>
-----------------------------------	--

Description

Construct dimension mapping (either aggregation or reporting) with explicit set elements for each dimension

Usage

```
.constructDimMapping(agg, rprt, brickSets, silent)
```

Arguments

<code>agg</code>	named vector of dimensions to aggregate
<code>rprt</code>	named vector of dimensions to report individually
<code>brickSets</code>	named list with definition of common set elements
<code>silent</code>	logical, suppress warnings and printing of dimension mapping

Value

nested named list with dimension mapping

.embrace	<i>Escape tag in curly brackets</i>
----------	-------------------------------------

Description

Escape tag in curly brackets

Usage

```
.embrace(tag)
```

Arguments

tag	character tag
-----	---------------

Value

character, tag in curly brackets

Author(s)

Robin Hasse

.excludeRows	<i>Exclude data matching giving filter criteria from a data set</i>
--------------	---

Description

Exclude data matching giving filter criteria from a data set

Usage

```
.excludeRows(data, exclude)
```

Arguments

data	data frame with the data set
exclude	named list with entries to be excluded from the data. The name gives the column name from which the entries given by the value should be removed.

Value

the given data set without the rows identified by the filter criteria

<code>.expandDims</code>	<i>Extend dimensions of a data frame by adding NA entries, add variable name</i>
--------------------------	--

Description

Extend dimensions of a data frame by adding NA entries, add variable name

Usage

```
.expandDims(df, varName, allSets)
```

Arguments

<code>df</code>	data frame to be extended
<code>varName</code>	character, variable name to be added
<code>allSets</code>	character, sets that need to be included as column names

Value

data frame

<code>.findInconsistenSetElements</code>	<i>Find inconsistencies in set elements between reporting template and.gdx</i>
--	--

Description

Find inconsistencies in set elements between reporting template and.gdx

Usage

```
.findInconsistenSetElements(brickSets,.gdx)
```

Arguments

<code>brickSets</code>	character, BRICK reporting template
<code>gdx</code>	file path to a BRICK.gdx

Value

named list of missing and surplus sets elements

<code>.findTags</code>	<i>Find all tags in name escaped in curly brackets</i>
------------------------	--

Description

Find all tags in name escaped in curly brackets

Usage

```
.findTags(name)
```

Arguments

name	character, variable name
------	--------------------------

Value

vector of tags in name, NULL if there are none

<code>.getDims</code>	<i>Get dimension names from stock and flow objects</i>
-----------------------	--

Description

Gives the column names of a list of data frames except the first and the last one, i.e. qty and value.

Usage

```
.getDims(calibObj, removeDims = NULL)
```

Arguments

calibObj	list, calibration targets
removeDims	character, additional dimensions to be removed from the output

Value

character with dimension names

<code>.missingElements</code>	<i>List any missing elements in any given dimension</i>
-------------------------------	---

Description

List any missing elements in any given dimension

Usage

```
.missingElements(x, dimLst)
```

Arguments

<code>x</code>	MagPIE object, BRICK object
<code>dimLst</code>	named vector, dimension ans names and elements as values

Value

vector of missing dimension elements in x

<code>.readGdxIter</code>	<i>Read a symbol from several gdx files and combine in one data frame</i>
---------------------------	---

Description

Read a symbol from several gdx files and combine in one data frame

Usage

```
.readGdxIter(
  gdx,
  symbol,
  maxIter,
  minIter = 0,
  asMagpie = TRUE,
  ttotFilter = NULL,
  replaceVar = FALSE,
  dims = NULL
)
```

Arguments

gdx	Path to.gdx files; all.gdx file names are assumed to be numbered and adhere to the structure: If gdx = <path/to/file/name.gdx>, the function looks for <path/to/file/name_0.gdx>, <path/to/file/name_1.gdx>, ...
symbol	Symbol to be read from the.gdxes
maxIter	Last iteration to be read
minIter	First iteration to be read
asMagpie	logical, convert to magpie object?
ttotFilter	numeric/factor, time periods to filter for
replaceVar	logical, replace column names bs and hs by bsr and hsr?
dims	character, containing the colum names expected for the object that is read in. Only required if the object does not exist to create replacement with NAs

Value

data frame of all results read in

<i>.replaceVarName</i>	<i>Replace column names bs and hs by bsr and hsr</i>
------------------------	--

Description

Replace column names bs and hs by bsr and hsr

Usage

```
.replaceVarName(df)
```

Arguments

df	data frame
----	------------

Value

data frame where column names have been replaced

.select	<i>select values from MAgPIE-obect</i>
---------	--

Description

This is a wrapper around `magclass::mselect` that also allows the selection of combinations of multiple dimensions.

Usage

```
.select(x, ...)
```

Arguments

x	MAgPIE object
...	entry selection. Combined dimensions have to be seperated with . for both the set names and the set elements.

Value

MAgPIE object containing only selected entries

.setNames	<i>Wrapper around setNames</i>
-----------	--------------------------------

Description

Wrapper around `setNames`

Usage

```
.setNames(object, nm)
```

Arguments

object	MAgPIE object
nm	a vector of names current names should be replaced with. If only one data element exists you can also set the name to NULL.

Value

NULL if object is NULL else object with manipulated names

<code>.split</code>	<i>Split dimension names</i>
---------------------	------------------------------

Description

Split each entry of a character vector and return one unnested character vector.

Usage

```
.split(x, split = "\\.")
```

Arguments

<code>x</code>	character vector
<code>split</code>	character used to split <code>x</code>

Value

character vector with each dimension as an own entry

Author(s)

Robin Hasse

<code>checkMatching</code>	<i>Check the matching results for inconsistencies</i>
----------------------------	---

Description

Check the matching results for inconsistencies

Usage

```
checkMatching(path, tol = 0.01)
```

Arguments

<code>path</code>	character, path to the matching result files
<code>tol</code>	numeric, absolute tolerance in million m2 against which to check the stock balance equations

Author(s)

Ricarda Rosemann

convGDX2MIF

*Read in GDX from BRICK and write *.mif reporting*

Description

Read in all information from GDX file that was generated with BRICK and create the *.mif reporting

Usage

```
convGDX2MIF(
 .gdx,
  tmpl = NULL,
  file = NULL,
  scenario = "default",
  t = NULL,
  silent = TRUE
)
```

Arguments

gdx	file path to a BRICK.gdx
tmpl	character, BRICK reporting template. There has to be a brickSets mapping named with the same suffix: brickSets_<tmpl>.yaml
file	name of the mif file which will be written, if no name is provided a magpie object containing all the reporting information is returned
scenario	scenario name that is used in the *.mif reporting
t	numeric vector of reporting periods (years)
silent	boolean, suppress warnings and printing of dimension mapping

Author(s)

Robin Hasse

extendPeriods

Crop MagPIE object to given periods and fill missing periods

Description

Crop MagPIE object to given periods and fill missing periods

Usage

```
extendPeriods(x, periods, fill = NA)
```

Arguments

x	MagPIE object
periods	numeric vector with target periods
fill	value to fill missing period values

Value

MagPIE object with given periods in temporal dimension

Author(s)

Robin Hasse

plotBRICKCalib

Render the BRICK calibration plotting routine

Description

Renders the file plotCalibration.Rmd to create the plots for the BRICK calibration

Usage

```
plotBRICKCalib(
  path = ".",
  cal = "BRICK_calibration_report.csv",
  outName = "",
  scenNames = NULL
)
```

Arguments

path	(named) character vector, path(s) to output directories. If several paths are given, the names can be used to pass short scenario names.
cal	character vector, name(s) of file(s) with calibration reporting results
outName	character, string added to the pdf file name and names of additionally saved plots
scenNames	character vector, scenario names for different paths. Needs to be specified if path is unnamed and contains more than one element.

Author(s)

Ricarda Rosemann

plotMatching	<i>Matching reporting</i>
--------------	---------------------------

Description

Plot the following matching reporting

- comparison of the matching values and reference targets
- share of initial heating systems that have been removed over time

Usage

```
plotMatching(path, outputFolder = NULL)
```

```
plotMatchingComparison(path, outputFolder = NULL)
```

Arguments

path	character, path to the run
outputFolder	character, directory where output file is stored. If NULL, the plots folder inside the given path is used.

Value

file path to created output file

Author(s)

Robin Hasse

readBrickSets	<i>Read brickSets mapping</i>
---------------	-------------------------------

Description

This function creates an explicit named list with the elements of all BRICK dimensions and corresponding reporting names.

Usage

```
readBrickSets(tmpl = NULL)
```

Arguments

tmpl	character, BRICK reporting template
------	-------------------------------------

Value

named list with definition of common set elements

Author(s)

Robin Hasse

readGdxSymbol	<i>Read symbol from gams container</i>
---------------	--

Description

Read symbol from gams container

Usage

```
readGdxSymbol(
 .gdx,
  symbol,
  field = "level",
  asMagpie = NULL,
  stringAsFactor = TRUE,
  removeDescription = TRUE
)
```

Arguments

<code>.gdx</code>	character, file path to GDX file
<code>symbol</code>	character, name of gams object
<code>field</code>	character, field to read (only relevant for variables)
<code>asMagpie</code>	boolean, return Magpie object. By default (NULL), variables are reported as magpie and sets as data frames
<code>stringAsFactor</code>	logical, keep default factors from gams
<code>removeDescription</code>	logical, if TRUE, the description column of set records (<code>element_text</code>) is removed

Value

MagPIE object with data of symbol

Author(s)

Robin Hasse

reportAgg	<i>Report aggregated quantities</i>
-----------	-------------------------------------

Description

Report aggregated quantities

Usage

```
reportAgg(
  x,
  name,
  brickSets = readBrickSets(NULL),
  agg = NULL,
  rpvt = NULL,
  silent = TRUE
)
```

Arguments

<code>x</code>	MagPIE object, BRICK object
<code>name</code>	character, name of reporting variable. reported dimensions passed with <code>rpvt</code> have to be escaped with curly brackets.
<code>brickSets</code>	named list, BRICK reporting template
<code>agg</code>	named vector of dimensions to aggregate. Names are dimension names of <code>x</code> and values are either set elements or subsets of set elements to consider.
<code>rpvt</code>	named vector of dimensions to report individually. Names are dimension names of <code>x</code> and values are either set elements or subsets of set elements to report.
<code>silent</code>	boolean, suppress warnings and printing of dimension mapping

Note

To consider specific combinations of dimensions in both `agg` or `rpvt`, the combination can be given just like one dimension separated by ..

Author(s)

Robin Hasse

reportBuildingStock	<i>Report building Stock</i>
---------------------	------------------------------

Description

Report quantities describing the stock of buildings

Usage

```
reportBuildingStock(gdx, brickSets = NULL, silent = TRUE)
```

Arguments

gdx	gams transfer container of the BRICK GDX
brickSets	character, BRICK reporting template
silent	boolean, suppress warnings and printing of dimension mapping

Author(s)

Robin Hasse

reportCalibration	<i>Read in model results from calibration for each iteration, calculate deviation</i>
-------------------	---

Description

Read in model results from calibration for each iteration, calculate deviation

Usage

```
reportCalibration(gdx, flowTargets = TRUE)
```

Arguments

gdx	path to a gdx; it is assumed that for each iteration a gdx is present with this path and the iteration number inserted at the end.
flowTargets	logical, if set to FALSE, the function does not expect the presence of targets for the flows

Author(s)

Ricarda Rosemann

reportConstruction	<i>Report construction</i>
--------------------	----------------------------

Description

Report quantities describing the construction of new buildings

Usage

```
reportConstruction(gdx, brickSets = NULL, silent = TRUE)
```

Arguments

gdx	gams transfer container of the BRICK GDX
brickSets	character, BRICK reporting template
silent	boolean, suppress warnings and printing of dimension mapping

Author(s)

Robin Hasse

reportDemolition	<i>Report demolition</i>
------------------	--------------------------

Description

Report quantities describing the demolition of buildings

Usage

```
reportDemolition(gdx, brickSets = NULL, silent = TRUE)
```

Arguments

gdx	gams transfer container of the BRICK GDX
brickSets	character, BRICK reporting template
silent	boolean, suppress warnings and printing of dimension mapping

Author(s)

Robin Hasse

reportEmissions	<i>Report emissions</i>
-----------------	-------------------------

Description

Report CO2 emissions from space heating

Usage

```
reportEmissions(gdx, brickSets = NULL, silent = TRUE)
```

Arguments

gdx	gams transfer container of the BRICK GDX
brickSets	character, BRICK reporting template
silent	boolean, suppress warnings and printing of dimension mapping

Author(s)

Robin Hasse

reportEnergy	<i>Report energy demand</i>
--------------	-----------------------------

Description

Report final and useful energy demand for space heating

Usage

```
reportEnergy(gdx, brickSets = NULL, silent = TRUE)
```

Arguments

gdx	gams transfer container of the BRICK GDX
brickSets	character, BRICK reporting template
silent	boolean, suppress warnings and printing of dimension mapping

Author(s)

Robin Hasse

reportRenovation	<i>Report renovation of heating systems</i>
------------------	---

Description

Report quantities describing the renovation of heating systems

Usage

```
reportRenovation(
  gdx,
  renovatedObj = c("bs", "hs"),
  brickSets = NULL,
  silent = TRUE
)
```

Arguments

gdx	gams transfer container of the BRICK GDX
renovatedObj	character, renovation measure considered, needs to be either bs (building shell) or hs (heating system).
brickSets	character, BRICK reporting template
silent	boolean, suppress warnings and printing of dimension mapping

Author(s)

Ricarda Rosemann

showMatchingComparison	<i>Plot comparison between matching references and model values</i>
------------------------	---

Description

Create stacked bar plots to verify matching accuracy

Usage

```
showMatchingComparison(path, showTitles = TRUE)
```

Arguments

path	character, path to the run
showTitles	logical, if TRUE, the references name and basic variable name are shown as title in each plot. No titles otherwise.

Value

named list of ggplot2 objects

Author(s)

Robin Hasse

showMatchingStandingStock

Plot share of initial heating systems removed

Description

Show the share of heating systems standing in the initial time step that have been removed over time. The tunnel marks the allowed space between the lower and upper limit defined in `p_shareRenHSinit` and the solid line shows the value eventually chosen in the matching by `v_shareRenHSinit`. The dashed line shows the extrapolation of this result to future time steps that go beyond the temporal scope of the matching. The dotted line marks the central value that results from an evenly distributed installation up until the initial time steps. The central value is not considered in the optimisation but used as supporting point in the extrapolation.

Usage

```
showMatchingStandingStock(path)
```

Arguments

path character, path to the run

Value

named list of ggplot2 objects

Author(s)

Robin Hasse

showSankey

*Plot Sankey diagram***Description**

Visualise transitions from one state to another. This plot helps to follow the exact renovation flows, though it quickly gets very complex.

Usage

```
showSankey(
  path,
  fill = c("bs", "hs"),
  showOnlyRenovation = FALSE,
  filterData = NULL,
  maxPeriodsInRow = NULL,
  save = TRUE
)
```

Arguments

path	character, path to the run
fill	character, dimension mapped to fill, either "bs" (building shell) or "hs" (heating system).
showOnlyRenovation	logical, if FALSE, the stock and all flows are shown including untouched buildings. If TRUE, only renovation activities are shown. This is helpful to better observe the renovation decision, especially with short time steps where renovation only affects a small share of the stock.
filterData	named list to filter the data before plotting
maxPeriodsInRow	maximum number of time steps to plot in one row. If there is more data, it is broken across multiple lines. If NULL, all data is shown in one line.
save	control how the plot should be saved: • 'TRUE': plot is saved in plots folder of run path • 'FALSE': plot is not saved (but always returned invisibly) • character: plot is saved in given directory

Author(s)

Robin Hasse

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