

Resource Adequacy in the Pentilateral Energy Forum

WP1: Determining minimum standards and best-practice for requirements regarding data used in resource adequacy assessments

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List of abbreviations	
aFRR	Automatic frequency restoration reserve
BZ	Bidding zone
CAPEX	Capital expenditures
CCGT	Combined cycle gas turbine
CHP	Combined heat and power
CM	Capacity mechanism
CNEC	Critical network element and contingency
CONE	Cost of new entry
CORP	Cost of renewal or prolongation
CY	Climate year
DC	Direct current
DSR	Demand-side response
ED	Economic dispatch
EMR	Electricity market regulation
ENS	Energy not served
EOM	Energy-only-market
EPS	Emission performance standard
ERAA	European resource adequacy assessment
EV	Electric vehicle
EVA	Economic viability assessment
FCR	Frequency containment reserve
FOM	Fixed operation and maintenance
GSK	Generation shift key
GT	Gas turbine
HVDC	High-voltage direct current
mFRR	Manual frequency restoration reserve
MS	Member state
MTU	Market time unit

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NGC	Net generating capacity
NTC	Net transmission capacity
O&M	Operation & maintenance
OCGT	Open cycle gas turbine
OOM	Out-of-market
OPEX	Operational expenditures
PSP	Pumped storage plants
PST	Phase shifting transformers
PTDF	Power transfer distribution factor
PtG	Power-to-gas
PtH	Power-to-heat
RAA	Resource adequacy assessment
RAM	Remaining available margin
RES	Renewable energy source
RoR	Run-of-river
RR	Restoration reserve
RS	Reliability standard
TJ	Turbojet
TSO	Transmission system operator
TY	Target year
TYNDP	Ten-year network development plan
V2G	Vehicle-to-grid
VoLL	Value of lost load
WACC	Weighted average cost of capital
WACC	Weighted average cost of capital
WP	Work package

Relevant documents	Link
ACER Decision on the ERAA methodology: Annex 1	https://ec.europa.eu/energy/sites/default/files/methodology_for_the_european_resource_adequacy_assessment.pdf
ACER Decision on the Methodology for calculating the value of lost load, the cost of new entry, and the reliability standard: Annex I	https://documents.acer.europa.eu/Official_documents/Acts_of_the_Agency/Individual%20decisions%20Annexes/ACER%20Decision%20No%2023-2020_Annexes/ACER%20Decision%2023-2020%20on%20VOLL%20CONE%20RS%20-%20Annex%20I.pdf

Contacts at r2b Energy Consulting

Robert Diels, Manager	robert.diels@r2b-energy.com
Marcel Brodhof, Consultant	marcel.brodhof@r2b-energy.com

A. Remarks for list of data inputs

Column	Description
Category	Main category of the RAA element: <ul style="list-style-type: none"> - Electricity supply-side data - Electricity demand-side data - Network and infrastructural data - Policy, regulatory and market design data
Subcategory	An element of the electricity system that is modelled/reflected in RAA. Interdependencies between the elements may exist. The RAA-elements are: <ul style="list-style-type: none"> - Conventional electricity demand - Electricity demand of EV - Electricity demand for space heating and cooling - Large-scale PtX - VoLL - Thermal generation - Intermittent RES generation - Hydro modelling - Industrial DSR - Battery storage units - Unplanned outages - CONE/CORP - Balancing requirements - Cross-border trade modelling (between modelled zones) - Exchanges with non-explicitly modelled systems - Capacity mechanisms - Market and regulatory constraints
Description	Short description of the RAA element.
Reference (Article)	If not stated otherwise, list of the for the respective element relevant articles in the ACER-approved ENTSO-E methodology.
Data inputs	<u>Minimum standard</u> : List of data inputs required to fulfil the requirements of EU Regulation when modelling the RAA element. <u>Best-practice</u> : List of data inputs that are not required by the EU Regulation, but that have additional value for the quality of the RAA. If considered, the use of some "minimum standard"-inputs may become obsolete.
Definition	States briefly how the data inputs of the respective standard should be applied in order to <u>Minimum standard</u> : fulfil the requirements of EU Regulation, or <u>Best-practice</u> : reflect a best-practice approach for RAA.
Granularity (spatial / temporal)	Indicates in which granularity the variables should be available to fulfil a specific standard.
Prioritisation/recommendation	Short recommendation which standard should be followed based on scope of the assessment and cost-benefit considerations.
Confidentiality	Identified potential confidentiality issues.
Restrictions	Indicates whether some information is not applicable for all countries or other limitations of the variables.
Remarks	Further remarks.

B. List of data inputs

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	A	B	C	D	E	F
1	Category	Sub-category	Description	Reference (Article)	Data inputs	
2					Minimum requirements	Best-practice approach
3	Electricity demand-side data	Conventional electricity demand	Overall level and structure of electricity demand for conventional and non-flexible applications, e.g. electrical appliances, (street) lighting, rail traffic.	4 (3)	Historical demand time series Temperature Load-temperature sensitivity Economic growth projection Penetration of new technologies Social and demographic developments Energy efficiency Other characteristics of relevant technologies that affect demand levels and shape Network losses Calendar data	Sectoral demand time series Demand time series of specific applications (e.g., lighting, cooking) Wind speed Irradiation Humidity
4		Electricity demand of EV	Level and structure of electricity demand of electric vehicles including DSR capability.	4 (3)(a), 5 (11)(ii)(2)	EV electricity demand time series	Number of EV Average mileage per type Average specific energy consumption per type Specific (price-sensitive) charging profiles Share of different charging profiles Average max. load of EV chargers V2G capacity

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1		Definition		Granularity (spatial / temporal)	
2	Sub-category	Minimum requirements	Best-practice approach	Minimum	Best-practice
3	Conventional electricity demand	<p>The for the model calculations underlying electricity demand is a time series based on historical observations. This time series considers the impact of relevant factors such as climate conditions (i.e., of the considered climate years), climate change, energy efficiency or economic growth on level and structure of electricity demand.</p> <p>The climate-dependency is represented by historic load-temperature sensitivity values.</p>	<p>The for the model calculations underlying electricity demand is a time series based on historical observations and projections of consumption on sectoral/application level .</p> <p>The climate-dependency is represented by climate data exceeding a simple load-temperature relationship.</p>	Per modelled zone, per target year, per MTU	Per sector/application.
4	Electricity demand of EV	<p>The model considers EV electricity demand with an exogenous demand time series. Option for DSR is not considered.</p>	<p>The modelling of EV electricity demand reflects the specific characteristics of the EV-fleet and accounts for price-sensitive EV-charging and V2G capabilities.</p>	Per modelled zone, per Target year per MTU (if applicable)	Per modelled zone, per Target year per MTU (if applicable)

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	B	K	L	M	N
1	Sub-category	Prioritisation/Recommendation	Confidentiality	Restrictions	Remarks
2					
3	Conventional electricity demand	If data inputs on a sector/application level are not available or greater efforts would be needed to obtain/generate those, the minimum requirements approach is sufficient for a high quality RAA. This in particular holds true because non-conventional (and partwise flexible) electricity demands are treated separately.	Sectoral demand level and structure may be confidential.	Availability of data on level and structure of electricity demand by application may be limited.	Link to WP2. Acer gives three options to incorporate climate change in RAA. An elaborated assessment of these options is given in the report of WP4.
4	Electricity demand of EV	Best-practice approach is recommended because neglecting flexibility of EV may lead to an underestimation of resource adequacy.	No confidentiality issues identified.		See the report of WP2 for options to incorporate flexibility of electric vehicles in RAA modelling.

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1	Category	Sub-category	Description	Reference (Article)	Data inputs	
2					Minimum requirements	Best-practice approach
5	Electricity demand-side data	Electricity demand for space heating and cooling	Level and structure of electricity demand arising from space heating and cooling by (hybrid) heat pumps, A/C or other technologies in the private and commercial sector including DSR capability	4 (3)(a)	Space heating/cooling electricity demand time series	Share of technologies covering heating/cooling demand Share of heat pumps combined with heat storage Heating/cooling load profile Temperature-dependency of heating/cooling demand Heating- and cooling hours Average values of coefficients of performance Thermal inertia constant Threshold of coefficient of performance for switching (hybrid heat pumps)
6		Large-scale PtX	Level and structure of electricity demand of large-scale PtX-technologies (mainly industrial process heat, electrolysis, etc.) including their DSR capability	1 (2)(d)	Electricity demand time series PtG Electricity demand time series PtH Shedding / opportunity costs	PtX capacities PtH capable heat demand Hydrogen demand Hydrogen import volume/cost Storage capabilities PtX Shedding / opportunity costs Flexibility assumptions PtX
7		VoLL	Value of lost load (VoLL) is the value non-flexible consumers place on energy not served (ENS)	VoLL CONE RS methodology Articles 3-8	One single VoLL per BZ	One single VoLL per BZ

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1	Sub-category	Definition		Granularity (spatial / temporal)	
2		Minimum requirements	Best-practice approach	Minimum	Best-practice
5	Electricity demand for space heating and cooling	The model considers the electricity demand from space heating and cooling with an exogenous demand time series. Option for DSR is not considered.	The modelling of heating/cooling electricity demand reflects the specific characteristics of the heating/cooling technologies and accounts for price-sensitive heating/cooling demands in conjunction with storage capabilities.	Per modelled zone, Per target year, per MTU	Per modelled zone, Per target year, per MTU
6	Large-scale PtX	The model considers the electricity demand from industrial PtG and PtH with an exogenous demand time series and accounts for load shedding capabilities.	The modelling of industrial PtX electricity demand reflects the specific characteristics of the different PtX technologies and accounts for price-sensitive PtX demands in conjunction with alternative generation (e.g. CHP instead of PtH), storage and import capabilities.	Per modelled zone, per Target year, per MTU (if applicable)	Sectoral differentiation Per modelled zone, per Target year, per MTU (if applicable)
7	VoLL	Single VoLL calculated reflecting the willingness to accept load shedding or the willingness to pay to avoid load shedding taking into account the preferences of different consumers not active in DSR on electricity markets.	No differentiation between minimum and best-practice standard applicable.	Per modelled zone, for whole study period	Per modelled zone, for whole study period

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1	Sub-category	Prioritisation/Recommendation	Confidentiality	Restrictions	Remarks
2					
5	Electricity demand for space heating and cooling	Best-practice approach is recommended because neglecting flexibility of HP may lead to an underestimation of resource adequacy.	No confidentiality issues identified.		<p>Demand for process heat or non-electrified space heating is not considered.</p> <p>See the report of WP2 for options to incorporate flexibility of heating and cooling applications in RAA modelling.</p>
6	Large-scale PtX	The choice between modelling alternatives should depend on the importance and role of PtX technologies in the focus area in the study period .	No confidentiality issues identified.		<p>The Regulation does not explicitly require the modelling of PtX technologies. However, Article 1 (2)(d) implies they should be considered.</p> <p>Link to WP2</p>
7	VoLL	Not applicable.	No confidentiality issues identified.	For some MS bidding zones no VoLL values available.	<p>Main sectors refer to the sectors specified in Annex 1 , paragraph (4.1) of the VoLL CONE RS methodology.</p> <p>Link to WP2</p>

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1	Category	Sub-category	Description	Reference (Article)	Data inputs	
2					Minimum requirements	Best-practice approach
8	Electricity demand-side data	Industrial DSR	Explicit voluntary load reduction or load shifting of industrial consumers.	4 (3)(c)(d)	DSR installed capacity DSR unit activation price DSR load shifting costs DSR operational constraints DSR maximum activation capacity DSR maximum activation duration Demand elasticity on the DA-market	DSR CAPEX DSR potential
9	Electricity supply-side data	Thermal generation	Economic dispatch of all, for the modelled system relevant, thermal generation technologies based on fossil, renewable or nuclear fuels and waste. Economic viability assessment of fossil-based generation technologies.	4 (3)(e)(i-ii), 4 (3)(f) 4 (4)(a-c), 5 (10)(c), 7 (4)(a)	Available NGC Fuel efficiency Fuel cost Emission factor Carbon price Type of fuel CAPEX Annual fixed costs Variable O&M cost WACC Discount rate Remaining economic lifetime Expected revenues from electricity-related services (e.g. ancillary services) Expected revenues from services outside the electricity sector (e.g. heat supply) Expected revenues from subsidies Expected revenues from CMs Planned outage schedule	Start-up time Shut-down time Min/max generating capacity Minimum run-time Ramping capability Constraints regarding temperature dependency Seasonal impact on generation capacity availability Fuel availability Cooling water constraints Capacity requirements for system services

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1	Sub-category	Definition		Granularity (spatial / temporal)	
2		Minimum requirements	Best-practice approach	Minimum	Best-practice
8	Industrial DSR	Explicit modelling of industrial DSR capacities, considering operational constraints, load shifting and activation costs, based on exogenously determined DSR capacities for each TY. Further price-elastic demand of the private and commercial sector is applied implicitly via price-elastic parts of electricity consumption of these sectors.	Explicit modelling of industrial DSR potentials to be tapped during EVA and then used in the ED, taking into account technical constraints, load shifting and activation costs and CAPEX. Further price elastic demand of the private or commercial sector is also explicitly modelled, considering technical and behavioural constraints (e.g. EVs, electric heat pumps, oom-batteries), thus no implicit DSR input is needed.	Per modelled zone, per target year	Per industrial sector/application, per target year
9	Thermal generation	The model considers the technical and economical characteristics and constraints of thermal generation technologies, as listed, consistently between ED and EVA. Given the two different EVA approaches allowed by the methodology, some distinctions apply: 1) EVA through system cost minimization: Considers those data inputs needed for calculation of wholesale market and CM revenues (c.f. subcategory capacity mechanisms), taking into account minimum data inputs. Other revenue streams are no data inputs, but model results (e.g. heat- or AS-revenues). 2) EVA of individual capacity resources: Besides the wholesale prices from ED, it considers also those minimum data inputs needed for the calculation of other revenue streams than wholesale markets.	The model considers thermal generation and the more detailed best-practice data inputs on their technical and economical constraints consistently between ED and EVA. The EVA/ED is applied analogously to the minimum requirements, but considers more detailed technical constraints enabling more realistic modelling of thermal dispatch.	Per modelled zone, per target year, per MTU	Per stylized unit, per target year, per MTU

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1	Sub-category	Prioritisation/Recommendation	Confidentiality	Restrictions	Remarks
2					
8	Industrial DSR	If data availability is given, inclusion of DSR in EVA is strongly recommended because otherwise the flexibility of the electricity system may be underestimated.	Data on industrial consumption may be confidential, esp. In small countries or industries, when even aggregated data may allow for identification of individual actors.		See the report of WP2 for an elaborated assessment of DSR modelling methodology.
9	Thermal generation	Fulfilling minimum requirements is sufficient to deliver high-quality RAA. Following the best-practice approach is computationally complex (or even infeasible) and the added value is unlikely to justify these efforts.	Individual power plant data may be confidential.		4 (3)(f) declares that technical constraints must be considered and lists possible constraints. However, it is not specified whether all of these constraints are required. Possibly, all constraints that are applicable to a specific generation technology may be required to fulfil minimum standard. Link to WP3

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1					Data inputs	
2	Category	Sub-category	Description	Reference (Article)	Minimum requirements	Best-practice approach
10	Electricity supply-side data	Intermittent RES generation	Generation of weather-dependent, non-dispatchable RES units (PV, wind onshore, wind offshore).	4 (2)(a), 4 (4)(d)	NGC of RES technologies Time-varying load factors Evolution of technical characteristics	Temperature impact on generation Wind speeds Direct solar irradiation Diffuse solar irradiation Performance curves Hub height of wind units
11		Hydro modelling	Parameters to model hydro generation and storage units (i.e. RoR, PSP).	4 (4)(d) 4 (5)(a)	Run-of-river capacity Time-varying load factors Run-of-river Open-loop storage capacity Closed-loop storage capacity Hydro inflow Reservoir size Minimum energy release requirements Upper/lower reservoir levels Min/max pumped energy Min/max generated energy Min/max generation capacity Min/max pumping capacity Environmental constraints Operational principles	see minimum requirements

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1	Sub-category	Definition		Granularity (spatial / temporal)	
2		Minimum requirements	Best-practice approach	Minimum	Best-practice
10	Intermittent RES generation	<p>The model considers the climate-dependency of RES generation on a regional level and accounts for climate change.</p> <p>The impact of technical developments of the different RES technologies is taken into account.</p>	<p>Climate-dependency of RES generation and climate change is considered with a high spatial resolution. The model translates weather data into load factors accounting for the effects of temperature levels and altitude.</p>	<p>Per modelled zone, Per target year, per MTU</p>	<p>High spatial resolution (10 x 10km or higher), altitude levels (for wind speeds)</p>
11	Hydro modelling	<p>1) With ex-ante optimisation Run-of-river: Model considers the climate-dependency of RoR generation per CY and MTU (if applicable). Open-loop / closed-loop: Model considers technical and inflow constraints per CY and MTU (if applicable). A time series of hydro storage availability is provided for the ED. This time series is based on an ex-ante optimisation phase and considers all relevant technical, operational and environmental constraints of the (pumped) hydro storage capacities.</p> <p>2) Direct modelling Feeding all relevant constraints directly into the ED model without any ex-ante optimisation phase, while considering specificities of the respective hydro systems (RoR, Pondage, open/close-loop reservoir, cascading systems), hydro conditions of the respective climate year, climate change, ecological and water management aspects.</p>	see minimum requirements	<p>Per modelled zone, per target year, per MTU/hydro inflow resolution</p>	

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1	Sub-category	Prioritisation/Recommendation	Confidentiality	Restrictions	Remarks
2					
10	Intermittent RES generation	If data availability allows, we recommend to choose a high spatial resolution that reflects the variance of climatic conditions in the modelled area appropriately. A possible trade-off between spatial accuracy and number of available climate years needs to be considered. A possible trade-off between spatial accuracy and number of available climate years needs to be considered.	No confidentiality issues identified.		Technical characteristics are not further specified. Acer gives three options to incorporate climate change in RAA. An elaborated assessment of these options is given in the report of WP4.
11	Hydro modelling	Data inputs of the two approaches are very similar. At this point of the project no definition of minimum requirements and best practice approaches as well as no prioritisation is possible. Maybe after the expert workshop we will be able to define those.	No confidentiality issues identified.	Hydro data may be not available or only with low temporal resolution.	Hydro inflow resolution is allowed to be lower than MTU. Acer gives three options to incorporate climate change in RAA. An elaborated assessment of these options is given in the report of WP4.

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1	Category	Sub-category	Description	Reference (Article)	Data inputs	
2					Minimum requirements	Best-practice approach
12	Electricity supply-side data	Battery storage units	Modelling of battery storage units	4 (3)(e) 4 (5)(b)	Maximum power battery Maximum energy storage battery Storage operating cost State of charge Charging/Discharging efficiency OOM battery capacity Peak-reduction ratio of OOM batteries Power-to-energy ratio	Number of out-of-market batteries Maximum total power of OOM batteries Cycle efficiency of OOM batteries Peak reduction of OOM batteries Ramp-rate reduction of OOM batteries CAPEX of battery storage Battery lifetime
13		Unplanned outages	Unplanned outages of generation and network units	4 (1)(e)(i), 4 (3)(g)	Unplanned outage rate generation units Unplanned outage rate HVDC interconnections Mean time to repair	Correlation of forced outages with market signals Share of (in)disponible forced outages

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1		Definition		Granularity (spatial / temporal)	
2	Sub-category	Minimum requirements	Best-practice approach	Minimum	Best-practice
12	Battery storage units	<p>The model considers exogenously determined in-the-market battery storage capacity accounting for technical constraints. Charing/discharging schedules are price-responsive and optimised in the ED.</p> <p>OOM-batteries are implicitly taken into account in overall consumption of commercial and private sector applying peak-shaving abilities, when determining their hourly load.</p>	<p>In-the-market battery storage is a legitimate investment option in the EVA accounting for technical constraints. Charing/discharging schedules are price-responsive and optimised in the ED.</p> <p>In addition to peak-shaving, the use of OOM-batteries for maximizing self-consumption is taken into account.</p>	Per modelled zone, Per target year, per MTU	Per modelled zone, Per target year, per MTU, per battery technology
13	Unplanned outages	Unplanned outages of resources (supply) and grid elements (HVDC lines) reflect historical outages rates and mean time to repair per technology and market zone (if applicable). Outage patterns are determined via Monte-Carlo-simulations.	The model fulfils all minimum requirements. The unplanned outage patters reflect a possible correlation of forced outages with market signals (i.e. less outages in times of high prices and vice versa).	Per modelled zone, per MTU, per technology type, per border	Per modelled zone, per MTU, per technology type, per border

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1	Sub-category	Prioritisation/Recommendation	Confidentiality	Restrictions	Remarks
2					
12	Battery storage units	If robust data and projections of battery capacity in the study period exist, the minimum standard may be sufficient for a high-quality RAA. Otherwise, the best-practice approach should be followed to allow battery storage in the EVA as an investment alternative.	No confidentiality issues identified.		The differentiation of battery technologies in the best-practice standard may include second life cycle batteries. Here, it must be distinguished whether they represent an alternative to other storage technologies (in the market) or serve as
13	Unplanned outages	Minimum requirements sufficient for robust and high quality results. Fulfilling the best-practice approach is costly for an assumingly low quality improvement.	Information regarding (in)disposability of forced outages may be constricted by operators.	Availability of information regarding (in)disposability of forced outages may be restricted.	An indisponible forced outage cannot be shifted or can be shifted for no more than twelve hours. A disponible forced outage may be shifted by more than twelve hours and up to four weeks (see VGB Power Tech / eurelectric).

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1	Category	Sub-category	Description	Reference (Article)	Data inputs	
2					Minimum requirements	Best-practice approach
14	Electricity supply-side data	CONE/CORP	Cost of new entry and cost of renewal/prolongation mean the fixed and variable cost for the entry of a new unit or respectively the renewal or prolongation of an existing unit.	VoLL CONE RS methodology Articles 9-17	Technology and type Electrical efficiency Emission factor Economic lifetime CAPEX Annual fixed cost WACC Fuel cost Carbon price Variable OPEX	Environmental requirements / compliance costs Construction period Licensing, permitting and spatial planning requirements Location Labour costs Fixed O&M costs Taxes and levies Transaction and control costs Fuel supply service contracts Fixed electricity transmission and distribution charges Cost of equity Cost of debt Long-term inflation rate Gearing Constraints on continuous energy production / demand reduction Expected operational conditions Voltage level Fuel supply network
15	Network and infrastructural data	Balancing requirements	Accounting for system reserve requirements to cover imbalances.	4 (4)(e), 4 (6)(g)	System reserve requirements FCR requirements aFRR/mFRR requirements RR requirements TSO contribution to FCR/FRR Shares of procured balancing reserves for "high-frequency" balancing purposes (i.e., load and RES noise, ramps, schedule jumps) and "low-frequency" balancing purposes (i.e., forced outages, forecast errors).	C.f. "minimum requirements"

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1	Sub-category	Definition		Granularity (spatial / temporal)	
2		Minimum requirements	Best-practice approach	Minimum	Best-practice
14	CONE/CORP	The model uses CONE/CORP values that consider all relevant cost types per technology (plants and storage) and type on an aggregated level.	The model uses CONE/CORP values that consider all relevant cost components per technology and type on a detailed level (where applicable).	Per modelled zone, technology and type.	Per modelled zone, target year, technology and type.
15	Balancing requirements	The model uses balancing requirements for the calculation of the contribution of procured resources to cover load. (Parts of) FCR, aFRR and mFRR may be assumed not being available to cover load (or being used to balance forced outages of plants).	The model uses balancing requirements for the calculation of the contribution of procured resources to cover load. It distinguishes between that part of procured resources for balancing "high-frequency" deviations from 50Hz (i.e., load and RE noise, ramps, schedule jumps) and that part procured for non-high-frequency deviation purposes (i.e., for unplanned outages, forecast errors). The former may not be used to cover load, while the latter is used to cover load as long as such spare capacity exists.	Per target year, per modelled zone	Per target year, per modelled zone

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1	Sub-category	Prioritisation/Recommendation	Confidentiality	Restrictions	Remarks
2					
14	CONE/CORP	Minimum requirements sufficient for robust and high quality results. DSR should be included in the EVA (cf. Prioritisation/recommendation for "DSR modelling").	Usually cost elements are trade secrets. Thus, calculation and validation of input values may be complex.	If DSR is modelled according to the minimum requirements, CONE/CORP are not required for DSR technologies.	There is room for discussion which cost elements are required for which standard.
15	Balancing requirements	Best-practice approach is recommended strongly because otherwise available capacity to cover load (or to balance forced outages) would be underrepresented. Only for very small and low-/no-interconnected electricity supply systems it may be reasonable to deduct reserve capacity from available load.	No confidentiality issues identified.		According to Art. 4 (6) g) Acer 24-2020 Annex I a part of procured balancing resources may not be used to cover load and thus be deducted from the available capacity or added to load. We highly recommend to reduce available capacity instead of increasing load, since the latter may distort modelling results (i.e., storage usage and energy balance).

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1	Category	Sub-category	Description	Reference (Article)	Data inputs	
2					Minimum requirements	Best-practice approach
16	Network and infrastructural data	Cross-border trade modelling (between modelled zones)	Methodology to model cross-border trade and physical flows between explicitly modelled zones.	4 (6)(a-f)	<p>MS action plans pursuant to Art. 15, Minimum capacity pursuant to Art. 16(8), Temporary derogations pursuant to Art. 16(9) EMR. Measures to reach electricity interconnection targets (interconnection projects)</p> <p>NTC-approach only: Net transmission capacity (NTC) Expected operational practices (i.e. connection agreements)</p> <p>Flow-based approach only: Identified CNECs Node-to-hub PTDF TYNDP reference grid Expected grid modifications HVDC flows PST settings Maximum admissible power flow Generation shift key (GSK) Zone-to-hub PTDF RAM</p>	see minimum requirements

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1	Sub-category	Definition		Granularity (spatial / temporal)	
2		Minimum requirements	Best-practice approach	Minimum	Best-practice
16	Cross-border trade modelling (between modelled zones)	The grid model should reflect the current/expected CCM (i.e., NTC or FBMC), considering national action plans and temporal derogations regarding availability of cross-zonal capacities (minRAM). NTC values reflect current and expected bilateral exchange capacities between market zones. FBMC reflects multilateral exchange possibilities between market zones, considering further operational practices and technical constraints (e.g., accounting for the use of PSTs, CNECs and respective PTDFs and GSK). Forced outages of HVDC network elements have to be considered explicitly in the NTC approach, while those outages are implicitly reflected in the FMBC approach.	The model fulfils all minimum requirements. Additionally, the available capacity on CNECs is based on the time-varying admissible power flow value. Network constraints impacted by climate conditions are estimated on a higher temporal granularity than seasonal (summer/winter). GSKs are calculated dynamically.	Flows: per MTU, Infrastructure: per TY, NTCs: per zone border and TY FBMC-parameters: per MTU (if applicable)	Flows: per MTU, Infrastructure: per TY, NTCs: per zone border and TY FBMC-parameters: per MTU (if applicable)

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1	Sub-category	Prioritisation/Recommendation	Confidentiality	Restrictions	Remarks
2					
16	Cross-border trade modelling (between modelled zones)	Minimum requirements sufficient for robust and high quality results. Costs to apply best-practice approach may exceed the benefits.	No confidentiality issues identified.		See ERAA methodology for a more detailed description of FBMC modelling approach.

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	A	B	C	D	E	F
1	Category	Sub-category	Description	Reference (Article)	Data inputs	
2					Minimum requirements	Best-practice approach
17	Network and infrastructural data	Exchanges with non-explicitly modelled systems	Cross-border flows with not explicitly modelled zones.	4 (1)(j), 4 (7)(a)	(Historical) time series of energy exchange	Price-elasticity of energy exchange or information on generation mix in not explicitly modelled zones.
18	Policy, regulatory and market design data	Capacity mechanisms	Characteristics of capacity mechanisms that are in place in one or more of the modelled zones.	3 (5), 5 (11)(b)	Type of already contracted capacity resource Volume of already contracted capacity resource Duration of CM contracts Annual amount paid to CM capacity EPS of capacities	For projections of future capacity demand and additional model-constraints: Residual load Reliability standard of MS/BZ De-rating of resources and interconnection Penalties
19		Market and regulatory constraints	Any binding political or regulatory constraints that are imposed on the market participants.	6 (14)	Phase-out restrictions Binding targets for specific technologies Price caps Other restrictions Subsidy schemes Feed-in prioritisation	C.f. "minimum requirements"

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	B	G	H	I	J
1	Sub-category	Definition		Granularity (spatial / temporal)	
2		Minimum requirements	Best-practice approach	Minimum	Best-practice
17	Exchanges with non-explicitly modelled systems	Cross-border power flows with non-explicitly modelled zones are represented by an exogenous time series. These time series are based on a best-guess considering all relevant market conditions as well as (expected) operational practices (i.e. bilateral agreements).	Cross-border power flows may be sensitive to prices per MTU in the neighbouring explicitly modelled zones.	Per border, per TY, per MTU	Per border, per TY, per MTU
18	Capacity mechanisms	Model accounts for capacity mechanisms based on the available direct information on the respective capacity market.	Model accounts for capacity mechanisms based on the available direct information on the respective capacity market and projections on future capacity demand of the respective capacity mechanism, under consideration of it's specific design.	Per modelled zone with capacity mechanism, per target year	Per modelled zone with capacity mechanism, per target year
19	Market and regulatory constraints	The model considers effective binding political and regulatory constraints appropriately. Price caps are required to be incrementally increased if they are about to be reached (but not more than to the respective VoLL). Sensible assumptions about the removal of regulatory barriers in the long-run should be made.	C.f. "minimum requirements"	Per modelled zone, per target year	Per modelled zone, per target year

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	B	K	L	M	N
1	Sub-category	Prioritisation/Recommendation	Confidentiality	Restrictions	Remarks
2					
17	Exchanges with non-explicitly modelled systems	Whether the benefits justify the cost of following the best-practice approach depends on the capacity of the interconnectors with non-explicitly modelled zones relative to the interconnection capacity with modelled zones.	No confidentiality issues identified.	Level and price-sensitivity of future power exchange patters may deviate from historical observations.	
18	Capacity mechanisms	We recommend applying the "best-practice" approach, because otherwise market design elements important for the RAA results are ignored.	Details of individual CM contracts may be confidential.	Some capacity mechanisms may already be approved but information on its specific design or amounts to be procured are not yet available.	Link to WP3
19	Market and regulatory constraints	Not applicable.	No confidentiality issues identified.		Link to WP3

C. List of sources

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	A	B	C	D	E	F	G	H	I	J	K	L	M
1				Short description			Countries covered						External Link
2	Database/ Publication	Author	Year		Categories covered	Type	AT	BE	DE	FR	LU	NL	
3	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	2021	Resource adequacy and flexibility study by the Belgian TSO published annually	Electricity supply-side data; Electricity demand-side data	forecast	No	Yes	No	No	No	No	https://www.elia.be/en/electricity-market-and-system/adequacy/adequacy-studies
4	Aggregated Gas Storage Inventory	GIE AGSI	2022	Database covers storage inventory as per member state, storage operator and storage site.	Infrastructural data	historical	Yes	Yes	Yes	Yes	Yes	No	https://agsi.gie.eu/#/
5	APG Report on Balancing	Austrian Power Grid AG	2018	Balancing report of the Austrian transmission system operator.	Electricity supply-side data	historical	Yes	No	No	No	No	No	https://www.apg.at/en/market/balancing
6	Balancing Capacities Platform	Réseau de Transport d'Electricité	2021	Balancing report of the French transmission system operator.	Electricity supply-side data	real-time/historical	No	No	No	Yes	No	No	https://www.services-rte.com/en/view-data-published-by-rte/balancing.html
7	Balancing energy information Belgium	Elia Group	2022	Information on current and past balancing requirements, activities and auctions of the Belgian TSO	Electricity demand-side data; Electricity supply-side data	historical	No	Yes	No	No	No	No	https://www.elia.be/en/grid-data/balancing
8	Carbon Pricing Dashboard	The World Bank	2021	Frequently updated platform for global (trans-)national carbon prices and carbon price schemes	Electricity supply-side data	real-time/historical	Yes	Yes	Yes	Yes	Yes	Yes	https://carbonpricingdashboard.worldbank.org/map_data
9	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	2018	Report with hurdle rates for renewable and fossil energy plants in Europe as main results.	Electricity demand-side data; Electricity supply-side data	historical/forecast	Yes	Yes	Yes	Yes	Yes	Yes	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/910814/Cost_of_Capital_Update_for_Electricity_Generation_Storage_and_Demand_Side_Response_Technologies.pdf

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	A	B	C	D	E	F	G	H	I	J	K	L	M
1				Short description	Categories covered	Type	Countries covered						External Link
2	Database/ Publication	Author	Year				AT	BE	DE	FR	LU	NL	
10	Data & Statistics IRENA	IRENA	2020	Detailed statistics on renewable energy capacity, power generation and renewable energy balances.	Electricity supply-side data	historical	Yes	Yes	Yes	Yes	Yes	Yes	https://www.irena.org/Statistics
11	Data dictionary	ecad.eu	2021	Database of daily series of observations of National Meteorological and Hydrological Services stations in Europe and the	Electricity supply-side data	historical	Yes	Yes	Yes	Yes	Yes	Yes	https://www.ecad.eu/dailydata/datadictionary.php
12	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	2022	Database that offers a global view on all energy storage technologies	Electricity supply-side data; Infrastructural data	historical/forecast	Yes	Yes	Yes	Yes	Yes	Yes	https://data.europa.eu/data/datasets/database-of-the-european-energy-storage-technologies-and-facilities?locale=en
13	ELECTRICITY GENERATION COSTS 2020	BEIS	2020	Report of the levelized cost estimates for electricity generation technologies, detailing methodology, data and assumptions.	Electricity supply-side data	forecast	Yes	Yes	Yes	Yes	Yes	Yes	https://www.gov.uk/government/publications/beis-electricity-generation-costs-2020
14	ELIA Balancing Report	Elia Group	2020	Balancing report of the Belgian transmission system operator, published ever two years.	Electricity supply-side data	historical	No	Yes	No	No	No	No	https://www.elia.be/-/media/project/elia/elia-site/keeping-the-balance/keeping-the-balance/20200622_report-article-60-ebgl_en.pdf?la=en
15	EMHIRES dataset Part I: Wind power generation	European Meteorological	2016	EMHIRES provides RES-E generation time series for the EU-28 and neighbouring countries.	Electricity supply-side data	historical	Yes	Yes	Yes	Yes	Yes	Yes	https://setis.ec.europa.eu/emhires-dataset-part-i-wind-power-generation_de

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	A	B	C	D	E	F	G	H	I	J	K	L	M
1				Short description			Countries covered						External Link
2	Database/ Publication	Author	Year		Categories covered	Type	AT	BE	DE	FR	LU	NL	
16	EMHIRES dataset Part II Solar power generation	European Meteorologic al	2016	EMHIRES provides RES-E generation time series for the EU-28 and neighbouring countries.	Electricity supply-side data	historical	Yes	Yes	Yes	Yes	Yes	Yes	https://setis.ec.europa.eu/emhires-dataset-part-ii-solar-power-generation_de
17	Energiedaten: Gesamtausgabe	BMWl	2019	Comprehensive statistics on energy supply and consumption in Germany published by the German Federal Government.	Electricity demand- side data; Electricity supply-side data	historical	No	No	Yes	No	No	No	https://www.bmwi.de/Redaktion/DE/Artikel/Energie/energiedaten-gesamtausgabe.html
18	Energy Statistics	STATBEL	2020	Energy statistics by economic sector and by energy source published by the Belgian Statistics Agency	Electricity demand- side data; Electricity supply-side data	historical	No	Yes	No	No	No	No	https://statbel.fgov.be/en/themes/energy/energy-statistics-economic-sector-and-energy-source
19	ENTSO-E Balancing Report	ENTSO-E	2020	Report that outlines the work achieved by TSO in implementing the Capacity Allocation and Congestion Management Regulation, the Forward Capacity Allocation Regulation and the Electricity Balancing Regulation.	Electricity supply-side data	historical	Yes	Yes	Yes	Yes	Yes	Yes	https://www.entsoe.eu/news/2020/06/30/2020-entso-e-market-reports/
20	ENTSO-E HVDC Utilisation and Unavailability Statistics 2020	ENTSO-E	2020	Report that presents the availability and utilisation of HVDC links connected to the Nordic and Baltic power system in 2020	Infrastructural data	historical	No	No	Yes	No	Yes	No	https://eepublicdownloads.azureedge.net/clean-documents/SOC%20documents/Nordic/ENTSO-E HVDC Utilisation and Unavailability Statistics 2020.pdf
21	Eurostat Database	Eurostat	2022	Energy statistics published by the European Statistics Agency	Electricity demand- side data	historical	Yes	Yes	Yes	Yes	Yes	Yes	https://ec.europa.eu/eurostat/web/energy/data/database
22	Eurostat Energy Balances	Eurostat	2022	Energy balances published by the European Statistics Agency	Electricity demand- side data; Electricity supply-side data; Infrastructural data	historical	Yes	Yes	Yes	Yes	Yes	Yes	https://ec.europa.eu/eurostat/de/web/energy/data/energy-balances

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1				Short description	Categories covered	Type	Countries covered						External Link
2	Database/ Publication	Author	Year				AT	BE	DE	FR	LU	NL	
23	FfE Open Data Platform	FfE	2022	Overview of free datasets for modelling energy demand and generation	Electricity demand-side data; Electricity supply-side data	historical/ forecast	Yes	Yes	Yes	Yes	Yes	Yes	http://opendata.ffe.de/
24	GDP growth	The World Bank	2021	Historical national GDP growth data published by the World Bank	Policy, regulatory and market design data	historical	Yes	Yes	Yes	Yes	Yes	Yes	https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG
25	Gesamtenergiebilanz Österreich	Statistik Austria	2021	Comprehensive statistics on energy supply and consumption in Austria published by the Austrian Statistics Agency	Electricity demand-side data; Policy data (policy-driven assumptions)	historical	Yes	No	No	No	No	No	https://www.statistik.at/web_de/statistiken/energie_umwelt_innovation_mobilitaet/energie_und_umwelt/energie/energiebilanzen/index.html
26	Heating Market Report	ehi.eu	2020	Heating market report of the European heating association including data and descriptions of up-to-date heating applications	Electricity demand-side data	historical	Yes	Yes	Yes	Yes	No	Yes	https://ehi.eu/heating-market-report/heating-market-report-2020/
27	IEA Data explorer	IEA	2022	This database, updated monthly, provides production, consumption and trade data for all OECD Member Countries and electricity production data for a selection of other economies.	Electricity supply-side data; Electricity demand-side data	historical	Yes	Yes	Yes	Yes	Yes	Yes	https://www.iea.org/reports/monthly-electricity-statistics-overview/data-explorer
28	Jahresdurchschnittspreis und -steuern für die wichtigsten Energieträger	Statistik Austria	2021	Data including average prices and taxes for energy carriers published by the Austrian Statistics Agency	Electricity supply-side data	historical	Yes	No	No	No	No	No	https://www.statistik.at/web_de/statistiken/energie_umwelt_innovation_mobilitaet/energie_und_umwelt/energie/preise_steuern/index.html

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1				Short description	Categories covered	Type	Countries covered						External Link
2	Database/ Publication	Author	Year				AT	BE	DE	FR	LU	NL	
29	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	2021	The study provides a current cost comparison for the conversion of different forms of energy into electricity as well as a forecast for the further cost development until the year 2040	Electricity supply-side data	historical/ forecast	Yes	Yes	Yes	Yes	Yes	Yes	https://www.ise.fraunhofer.de/de/veroeffentlichungen/studien/studie-stromgestehungskosten-erneuerbare-energien.html
30	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	2016	Project report providing a comprehensive picture of the state of the EU's H/C sector in 2015 as well as possible trajectories until 2020 and 2030.	Electricity demand-side data	historical/ forecast	Yes	Yes	Yes	Yes	Yes	Yes	https://www.isi.fraunhofer.de/de/competence-center/energiepolitik-energiemaerkte/projekte/mapping-heating_331945.html
31	Market Report	ehpa - European heat pump association	2021	Comprehensive publication on the European Heat Pump market provided by the European heat pump association	Electricity demand-side data	historical	Yes	Yes	Yes	Yes	No	Yes	https://www.ehpa.org/market-data/market-report-2021/
32	METIS Technical Note T4	European Commission	2019	Overview of European member state's electricity market policy framework and imposed changes according to EU regulation	Policy, regulatory and market design data	historical	No	Yes	Yes	Yes	No	Yes	https://op.europa.eu/en/publication-detail/-/publication/1cff0934-adc1-11e9-9d01-01aa75ed71a1
33	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	2021	Medium-term forecast for Germany-wide electricity generation from EEG-subsidised power plants for the calendar years 2022 to 2026 on behalf of the German TSOs	Electricity supply-side data	forecast	No	No	Yes	No	No	No	https://www.netztransparenz.de/EEG/Mittelfristprognosen/Mittelfristprognose-2022-2026
34	NECP AT	BMNT	2019	National Climate and Energy Plan published by the Austrian Government	Electricity demand-side data	historical/ forecast	Yes	No	No	No	No	No	https://ec.europa.eu/energy/topics/energy-strategy/national-energy-climate-plans_en

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	A	B	C	D	E	F	G	H	I	J	K	L	M
1				Short description			Countries covered						External Link
2	Database/ Publication	Author	Year		Categories covered	Type	AT	BE	DE	FR	LU	NL	
35	NECP BE	Belgian Government	2019	National Climate and Energy Plan published by the Belgian Government	Electricity demand-side data	historical/forecast	No	Yes	No	No	No	No	https://ec.europa.eu/energy/topics/energy-strategy/national-energy-climate-plans_en
36	NECP DE	BMWK	2019	National Climate and Energy Plan published by the German Government	Electricity demand-side data	historical/forecast	No	No	Yes	No	No	No	https://ec.europa.eu/energy/topics/energy-strategy/national-energy-climate-plans_en
37	NECP FR	DFBEW	2020	National Climate and Energy Plan published by the French Government	Electricity demand-side data; Policy data (policy-driven assumptions)	historical/forecast	No	No	No	Yes	No	No	https://ec.europa.eu/energy/topics/energy-strategy/national-energy-climate-plans_en
38	NECP LU	Government of Luxembourg	2018	National Climate and Energy Plan published by the Government of Luxembourg	Electricity demand-side data; Policy data (policy-driven assumptions)	historical/forecast	No	No	No	No	Yes	No	https://ec.europa.eu/energy/topics/energy-strategy/national-energy-climate-plans_en
39	NECP NL	Government of the Netherlands	2019	National Climate and Energy Plan published by the Government of the Netherlands	Electricity demand-side data; Policy data (policy-driven assumptions)	historical/forecast	No	No	No	No	No	Yes	https://ec.europa.eu/energy/topics/energy-strategy/national-energy-climate-plans_en
40	PECD	ENTSO-E	2021	Pan-European Climate Database including waterflow, wind speed and irradiation data	Electricity supply-side data	forecast	Yes	Yes	Yes	Yes	Yes	Yes	https://www.entsoe.eu/outlooks/eraa/eraa-downloads/
41	PEMMDB	ENTSO-E	2021	Pan European Market Modelling Database	Electricity demand-side data; Electricity supply-side data; Infrastructural data	historical	Yes	Yes	Yes	Yes	Yes	Yes	https://www.entsoe.eu/outlooks/eraa/eraa-downloads/
42	Population, total	The World Bank	2021	Historical national population growth data published by the World Bank	Policy, regulatory and market design data	historical	Yes	Yes	Yes	Yes	Yes	Yes	https://data.worldbank.org/indicator/SP.POP.TOTL

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	A	B	C	D	E	F	G	H	I	J	K	L	M
1				Short description			Countries covered						External Link
2	Database/ Publication	Author	Year		Categories covered	Type	AT	BE	DE	FR	LU	NL	
43	Projected Costs of Generating Electricity 2020	IEA	2020	Joint report by the International Energy Agency and the OECD Nuclear Energy Agency on electricity generating costs	Electricity supply-side data	forecast	Yes	Yes	Yes	Yes	No	Yes	https://www.iea.org/reports/ projected-costs-of- generating-electricity-2020
44	Regelleistung.net - Datencenter	50Hertz, Amprion, TenneT, TransnetBW	2021	Joint data platform of the German TSOs providing information and data on balancing energy requirements and balancing energy tenders.	Electricity supply-side data	real-time/ historical	No	No	Yes	No	Yes	No	https://www.regelleistung.ne t/apps/datacenter/tenders/? productTypes=PRL,SRL,MRL &markets=BALANCING CA PACITY,BALANCING ENER GY&date=2021-12- 20&tenderTab=PRL\$CAPAC ITY\$1
45	Revision of World Population Prospects	United Nations	2019	Historical and future national population growth data published by the United Nations	Policy, regulatory and market design data	historical/ forecast	Yes	Yes	Yes	Yes	Yes	Yes	https://population.un.org/wp p/
46	STATISTICAL FACTSHEET	ENTSO-E	2019	Annually updated factsheet providing essential information and data on ENTSO-E and its 41 member TSOs	Electricity supply-side data; Infrastructural data	historical	Yes	Yes	Yes	Yes	Yes	Yes	https://www.entsoe.eu/publi cations/statistics-and-data/
47	Study on the estimation of the value of lost load of electricity supply in Europe	ACER	2016	Study on the estimation of the Value of Lost Load (VoLL) of electricity supply in Europe	Electricity demand- side data	historical	Yes	Yes	Yes	Yes	Yes	Yes	https://extranet.acer.europa. eu/en/Electricity/Infrastruct ure_and_network%20develo pment/Infrastructure/Docu ments/CEPA%20study%20o n%20the%20Value%20of%2 0Lost%20Load%20in%20the %20electricity%20supply.pdf

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	A	B	C	D	E	F	G	H	I	J	K	L	M
1				Short description			Countries covered						External Link
2	Database/ Publication	Author	Year		Categories covered	Type	AT	BE	DE	FR	LU	NL	
48	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	2021	Report providing technology descriptions and projections for long-term energy system planning.	Electricity supply-side data	historical/forecast	Yes	Yes	Yes	Yes	Yes	Yes	https://ens.dk/sites/ens.dk/files/Analyser/technology_data_catalogue_for_el_and_dh.pdf
49	Transparency Platform	ENTSO-E	2022	Central collection and publication of electricity generation, transportation and consumption data and information for the pan-European market by the European TSOs	Electricity demand-side data; Electricity supply-side data; Infrastructural data	real-time/historical	Yes	Yes	Yes	Yes	Yes	Yes	https://transparency.entsoe.eu/transmission-domain/physicalFlow/show
50	TYNDP 2020	ENTSO-E	2020	Joint Ten-Year Network Development Plan of the European TSOs	Infrastructural data	forecast	Yes	Yes	Yes	Yes	Yes	Yes	https://tyndp2020-project-platform.azurewebsites.net/projectsheets

D. List of sources (detailed)

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	A	B	C	D	E	F	G	H	I	J	K	L
1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
3	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity demand-side data	Electricity demand of EV	Number of EV	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
4	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity demand-side data	Electricity demand for space heating and cooling	Heat pump penetration	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
5	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity demand-side data	Large-scale PtX	Electrolyser capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
6	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity demand-side data	Industrial DSR	Shedding capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
7	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity demand-side data	Industrial DSR	Shifting capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
8	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity supply-side data	Hydro modelling	Pumped storage capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
9	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity supply-side data	Battery storage units, Electricity demand of EV	Small, large and V2G battery capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
10	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity supply-side data	RES generation	PV capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
11	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity supply-side data	RES generation	Onshore Wind capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
12	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity supply-side data	RES generation	Offshore Wind capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
13	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity supply-side data	RES generation	Hydro RoR capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
14	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity supply-side data	RES generation	Biomass + Waste capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
15	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity supply-side data	Thermal generation	Nuclear capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
16	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity supply-side data	Thermal generation	CHP capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
17	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity supply-side data	Thermal generation	CCGT/OCGT capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
18	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity supply-side data	Thermal generation	CCGT-CHP capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032
19	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electricity supply-side data	Thermal generation	Turbojets capacity	No	Yes	No	No	No	No	2022; 2025; 2028; 2030; 2032

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	A	B	M	N	O	P	Q	R
1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
3	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Number of EV	target years	by country			Link
4	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Heat pump penetration	target years	by country			Link
5	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Electrolyser capacity	target years	by country			Link
6	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Shedding capacity	target years	by country	including ancillary services volume		Link
7	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Shifting capacity	target years	by country			Link
8	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Pumped storage capacity	target years	by country			Link
9	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Small, large and V2G battery capacity	target years	by country			Link
10	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	PV capacity	target years	by country			Link
11	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Onshore Wind capacity	target years	by country			Link
12	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Offshore Wind capacity	target years	by country			Link
13	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Hydro RoR capacity	target years	by country			Link
14	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Biomass + Waste capacity	target years	by country			Link
15	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Nuclear capacity	target years	by country			Link
16	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	CHP capacity	target years	by country			Link
17	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	CCGT/OCGT capacity	target years	by country			Link
18	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	CCGT-CHP capacity	target years	by country			Link
19	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Turbojets capacity	target years	by country			Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
20	Adequacy and Flexibility Study for Belgium 2022 - 2032 Elia Group		Electricity supply-side data Unplanned outages		Forced Outage Rate Nuclear	No	Yes	No	No	No	No	2011-2020
21	Adequacy and Flexibility Study for Belgium 2022 - 2032 Elia Group		Electricity supply-side data Unplanned outages		Forced Outage Rate CCGT	No	Yes	No	No	No	No	2011-2020
22	Adequacy and Flexibility Study for Belgium 2022 - 2032 Elia Group		Electricity supply-side data Unplanned outages		Forced Outage Rate GT	No	Yes	No	No	No	No	2011-2020
23	Adequacy and Flexibility Study for Belgium 2022 - 2032 Elia Group		Electricity supply-side data Unplanned outages		Forced Outage Rate TJ	No	Yes	No	No	No	No	2011-2020
24	Adequacy and Flexibility Study for Belgium 2022 - 2032 Elia Group		Electricity supply-side data Unplanned outages		Forced Outage Rate Waste	No	Yes	No	No	No	No	2011-2020
25	Adequacy and Flexibility Study for Belgium 2022 - 2032 Elia Group		Electricity supply-side data Unplanned outages		Forced Outage Rate CHP	No	Yes	No	No	No	No	2011-2020
26	Adequacy and Flexibility Study for Belgium 2022 - 2032 Elia Group		Electricity supply-side data Unplanned outages		Forced Outage Rate Pumped storage	No	Yes	No	No	No	No	2011-2020
27	Adequacy and Flexibility Study for Belgium 2022 - 2032 Elia Group		Electricity supply-side data Unplanned outages		Forced Outage Rate DC links (in each direction)	No	Yes	No	No	No	No	2011-2020
28	Adequacy and Flexibility Study for Belgium 2022 - 2032 Elia Group		Electricity supply-side data Thermal generation		availability of thermal generation units	No	Yes	No	No	No	No	2020 - 2032
29	Adequacy and Flexibility Study for Belgium 2022 - 2032 Elia Group		Electricity supply-side data Thermal generation; CONE/CORP		FOM (including major overhauls) [€/kW/y]	No	Yes	No	No	No	No	Current prices
30	Adequacy and Flexibility Study for Belgium 2022 - 2032 Elia Group		Electricity supply-side data Thermal generation; CONE/CORP		Hurdle rate in EOM (WACC + premium)	No	Yes	No	No	No	No	Current prices
31	Adequacy and Flexibility Study for Belgium 2022 - 2032 Elia Group		Electricity supply-side data Thermal generation; CONE/CORP		Economic Lifetime of units	No	Yes	No	No	No	No	Current assumption

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
20	Adequacy and Flexibility Study for Belgium 2022 - 2032		Forced Outage Rate Nuclear	average	by country	Variable given in number of occurrence, rate [%] and duration [h]		Link
21	Adequacy and Flexibility Study for Belgium 2022 - 2032		Forced Outage Rate CCGT	average	by country	Variable given in number of occurrence, rate [%] and duration [h]		Link
22	Adequacy and Flexibility Study for Belgium 2022 - 2032		Forced Outage Rate GT	average	by country	Variable given in number of occurrence, rate [%] and duration [h]		Link
23	Adequacy and Flexibility Study for Belgium 2022 - 2032		Forced Outage Rate TJ	average	by country	Variable given in number of occurrence, rate [%] and duration [h]		Link
24	Adequacy and Flexibility Study for Belgium 2022 - 2032		Forced Outage Rate Waste	average	by country	Variable given in number of occurrence, rate [%] and duration [h]		Link
25	Adequacy and Flexibility Study for Belgium 2022 - 2032		Forced Outage Rate CHP	average	by country	Variable given in number of occurrence, rate [%] and duration [h]		Link
26	Adequacy and Flexibility Study for Belgium 2022 - 2032		Forced Outage Rate Pumped storage	average	by country	Variable given in number of occurrence, rate [%] and duration [h]		Link
27	Adequacy and Flexibility Study for Belgium 2022 - 2032		Forced Outage Rate DC links (in each direction)	average	by country	Variable given in number of occurrence, rate [%] and duration [h]		Link
28	Adequacy and Flexibility Study for Belgium 2022 - 2032		availability of thermal generation units	target years	by country		Combined Cycle - Gas Turbine; Combined Cycle - Steam Turbine; Classic Gas Turbine; Steam Turbine;	Link
29	Adequacy and Flexibility Study for Belgium 2022 - 2032		FOM (including major overhauls) [€/kW/y]		by country	WACC proposed for this study is 5.53%; All prices are assumed to be in €2019.		Link
30	Adequacy and Flexibility Study for Belgium 2022 - 2032		Hurdle rate in EOM (WACC + premium)		by country	WACC proposed for this study is 5.53%; All prices are assumed to be in €2019.	Combined Cycle - Gas Turbine; Combined Cycle - Steam Turbine; Classic Gas Turbine; Steam Turbine;	Link
31	Adequacy and Flexibility Study for Belgium 2022 - 2032		Economic Lifetime of units		by country	WACC proposed for this study is 5.53%; All prices are assumed to be in €2019.	Combined Cycle - Gas Turbine; Combined Cycle - Steam Turbine; Classic Gas Turbine; Steam Turbine;	Link

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1	Database		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
32	Adequacy and Flexibility Study for Belgium 2022 - 2032		Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX [€/kW]	No	Yes	No	No	No	No	Current assumption
33	Adequacy and Flexibility Study for Belgium 2022 - 2032		Network and infrastructural data	Thermal generation	Minimum up time	No	Yes	No	No	No	No	Current assumption
34	Adequacy and Flexibility Study for Belgium 2022 - 2032		Network and infrastructural data	Thermal generation	Minimum down time	No	Yes	No	No	No	No	Current assumption
35	Adequacy and Flexibility Study for Belgium 2022 - 2032		Network and infrastructural data	Thermal generation	Hot start up time	No	Yes	No	No	No	No	Current assumption

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1				Temporal	Spatial			
2	Database	Author	Data input	resolution	resolution	Remarks	Additional Description	Link
32	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	CAPEX [€/kW]		by country	The industry wide reference WACC proposed for this study is 5.53%; All prices are assumed to be in €2019.	Units include: Combined Cycle; Combined Cycle - Gas Turbine; Combined Cycle - Steam Turbine; Classic Gas Turbine; Steam Turbine; Incineration Station; Nuclear; Turbojet; Cogeneration Unit	Link
33	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Minimum up time		by country	The industry wide reference WACC proposed for this study is 5.53%; All prices are assumed to be in €2019.	Units include: Combined Cycle; Combined Cycle - Gas Turbine; Combined Cycle - Steam Turbine; Classic Gas Turbine; Steam Turbine; Incineration Station; Nuclear; Turbojet; Cogeneration Unit; RES Generation Units; Interconnections (AC&DC); V2G; Electrolysers; Pumped Storage;	Link
34	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Minimum down time		by country	The industry wide reference WACC proposed for this study is 5.53%; All prices are assumed to be in €2019.	Units include: Combined Cycle; Combined Cycle - Gas Turbine; Combined Cycle - Steam Turbine; Classic Gas Turbine; Steam Turbine; Incineration Station; Nuclear; Turbojet; Cogeneration Unit; RES Generation Units; Interconnections (AC&DC); V2G; Electrolysers; Pumped Storage;	Link
35	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Hot start up time		by country	The industry wide reference WACC proposed for this study is 5.53%; All prices are assumed to be in €2019.	Units include: Combined Cycle; Combined Cycle - Gas Turbine; Combined Cycle - Steam Turbine; Classic Gas Turbine; Steam Turbine; Incineration Station; Nuclear; Turbojet; Cogeneration Unit; RES Generation Units; Interconnections (AC&DC); V2G; Electrolysers; Pumped Storage;	Link

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1	Database		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
36	Adequacy and Flexibility Study for Belgium 2022 - 2032		Network and infrastructural data	Thermal generation	Warm start up time	No	Yes	No	No	No	No	Current assumption
37	Adequacy and Flexibility Study for Belgium 2022 - 2032		Network and infrastructural data	Thermal generation	Cold start up time	No	Yes	No	No	No	No	Current assumption
38	Adequacy and Flexibility Study for Belgium 2022 - 2032		Network and infrastructural data	Thermal generation	Transition time from "hot" to "warm"	No	Yes	No	No	No	No	Current assumption
39	Adequacy and Flexibility Study for Belgium 2022 - 2032		Network and infrastructural data	Thermal generation	Transition time from "warm" to "cold"	No	Yes	No	No	No	No	Current assumption

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
36	Adequacy and Flexibility Study for Belgium 2022 - 2032		Warm start up time		by country	The industry wide reference WACC proposed for this study is 5.53%; All prices are assumed to be in €2019.	Units include: Combined Cycle; Combined Cycle - Gas Turbine; Combined Cycle - Steam Turbine; Classic Gas Turbine; Steam Turbine; Incineration Station; Nuclear; Turbojet; Cogeneration Unit; RES Generation Units; Interconnections (AC&DC); V2G; Electrolysers; Pumped Storage;	Link
37	Adequacy and Flexibility Study for Belgium 2022 - 2032		Cold start up time		by country	The industry wide reference WACC proposed for this study is 5.53%; All prices are assumed to be in €2019.	Units include: Combined Cycle; Combined Cycle - Gas Turbine; Combined Cycle - Steam Turbine; Classic Gas Turbine; Steam Turbine; Incineration Station; Nuclear; Turbojet; Cogeneration Unit; RES Generation Units; Interconnections (AC&DC); V2G; Electrolysers; Pumped Storage;	Link
38	Adequacy and Flexibility Study for Belgium 2022 - 2032		Transition time from "hot" to "warm"		by country	The industry wide reference WACC proposed for this study is 5.53%; All prices are assumed to be in €2019.	Units include: Combined Cycle; Combined Cycle - Gas Turbine; Combined Cycle - Steam Turbine; Classic Gas Turbine; Steam Turbine; Incineration Station; Nuclear; Turbojet; Cogeneration Unit; RES Generation Units; Interconnections (AC&DC); V2G; Electrolysers; Pumped Storage;	Link
39	Adequacy and Flexibility Study for Belgium 2022 - 2032		Transition time from "warm" to "cold"		by country	The industry wide reference WACC proposed for this study is 5.53%; All prices are assumed to be in €2019.	Units include: Combined Cycle; Combined Cycle - Gas Turbine; Combined Cycle - Steam Turbine; Classic Gas Turbine; Steam Turbine; Incineration Station; Nuclear; Turbojet; Cogeneration Unit; RES Generation Units; Interconnections (AC&DC); V2G; Electrolysers; Pumped Storage;	Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
40	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Network and infrastructural data	Thermal generation	Min Stable power	No	Yes	No	No	No	No	Current assumption
41	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Network and infrastructural data	Thermal generation	Ramp Rate	No	Yes	No	No	No	No	Current assumption
42	Aggregated Gas Storage Inventory	GIE AGSI	Network and infrastructural data	N/A	Gas storage capacity	Yes	Yes	Yes	Yes	Yes	No	current
43	APG Report on Balancing	Austrian Power Grid AG	Network and infrastructural data	Balancing requirements	aFRR requirements	Yes	No	No	No	No	No	2018
44	APG Report on Balancing	Austrian Power Grid AG	Network and infrastructural data	Balancing requirements	mFRR requirements	Yes	No	No	No	No	No	2018
45	APG Report on Balancing	Austrian Power Grid AG	Network and infrastructural data	Balancing requirements	Total FRR requirements	Yes	No	No	No	No	No	2018

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
40	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Min Stable power		by country	The industry wide reference WACC proposed for this study is 5.53%; All prices are assumed to be in €2019.	Units include: Combined Cycle; Combined Cycle - Gas Turbine; Combined Cycle - Steam Turbine; Classic Gas Turbine; Steam Turbine; Incineration Station; Nuclear; Turbojet; Cogeneration Unit; RES Generation Units; Interconnections (AC&DC); V2G; Electrolysers; Pumped Storage;	Link
41	Adequacy and Flexibility Study for Belgium 2022 - 2032	Elia Group	Ramp Rate		by country	The industry wide reference WACC proposed for this study is 5.53%; All prices are assumed to be in €2019.	Units include: Combined Cycle; Combined Cycle - Gas Turbine; Combined Cycle - Steam Turbine; Classic Gas Turbine; Steam Turbine; Incineration Station; Nuclear; Turbojet; Cogeneration Unit; RES Generation Units; Interconnections (AC&DC); V2G; Electrolysers; Pumped Storage;	Link
42	Aggregated Gas Storage Inventory	GIE AGSI	Gas storage capacity	updated frequently	by country; unit based	hydrogen storage capacity can be derived from this		Link
43	APG Report on Balancing	Austrian Power Grid AG	aFRR requirements	report published every 2 years	by country	in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	automatic Frequency Restoration Reserve	Link
44	APG Report on Balancing	Austrian Power Grid AG	mFRR requirements	report published every 2 years	by country	in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	manual Frequency Restoration Reserve	Link
45	APG Report on Balancing	Austrian Power Grid AG	Total FRR requirements	report published every 2 years	by country	in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing		Link

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1	Database		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
46	Balancing Capacities Platform	Réseau de Transport d'Electricité	Network and infrastructural data	Balancing requirements	FCR requirements	No	No	No	Yes	No	No	historical - today
47	Balancing Capacities Platform	Réseau de Transport d'Electricité	Network and infrastructural data	Balancing requirements	aFRR requirements	No	No	No	Yes	No	No	historical - today
48	Balancing Capacities Platform	Réseau de Transport d'Electricité	Network and infrastructural data	Balancing requirements	mFRR requirements	No	No	No	Yes	No	No	historical - today
49	Balancing Capacities Platform	Réseau de Transport d'Electricité	Network and infrastructural data	Balancing requirements	RR requirements	No	No	No	Yes	No	No	historical - today
50	Balancing energy information Belgium	Elia Group	Network and infrastructural data	Balancing requirements	Imbalance Price: Current system imbalance	No	Yes	No	No	No	No	2005 - 2021
51	Balancing energy information Belgium	Elia Group	Network and infrastructural data	Balancing requirements	Imbalance Price: Imbalance prices (1 minute)	No	Yes	No	No	No	No	2005 - 2021
52	Balancing energy information Belgium	Elia Group	Network and infrastructural data	Balancing requirements	Imbalance Price: Imbalance price (5 minutes)	No	Yes	No	No	No	No	2005 - 2021

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
46	Balancing Capacities Platform	Réseau de Transport d'Electricité	FCR requirements	30 minutes; daily; yearly	by country	Frequently updated interactive data register; in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	Frequency Containment Reserves	Link
47	Balancing Capacities Platform	Réseau de Transport d'Electricité	aFRR requirements	30 minutes; daily; yearly	by country	Frequently updated interactive data register; in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	automatic Frequency Restoration Reserve	Link
48	Balancing Capacities Platform	Réseau de Transport d'Electricité	mFRR requirements	30 minutes; daily; yearly	by country	Frequently updated interactive data register; in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	manual Frequency Restoration Reserve	Link
49	Balancing Capacities Platform	Réseau de Transport d'Electricité	RR requirements	30 minutes; daily; yearly	by country	Frequently updated interactive data register; in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	Replacement Reserve	Link
50	Balancing energy information Belgium	Elia Group	Imbalance Price: Current system imbalance	minute	by country			Link
51	Balancing energy information Belgium	Elia Group	Imbalance Price: Imbalance prices (1 minute)	minute	by country			Link
52	Balancing energy information Belgium	Elia Group	Imbalance Price: Imbalance price (5 minutes)	minute	by country			Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
53	Balancing energy information Belgium	Elia Group	Network and infrastructural data	Balancing requirements	aFRR	No	Yes	No	No	No	No	2005 - 2021
54	Balancing energy information Belgium	Elia Group	Network and infrastructural data	Balancing requirements	mFRR	No	Yes	No	No	No	No	2005 - 2021
55	Balancing energy information Belgium	Elia Group	Network and infrastructural data	Balancing requirements	Balancing energy activated	No	Yes	No	No	No	No	2005 - 2021
56	Balancing energy information Belgium	Elia Group	Network and infrastructural data	Balancing requirements	Prices per product of the activated balancing energy per minute	No	Yes	No	No	No	No	2005 - 2021
57	Balancing energy information Belgium	Elia Group	Network and infrastructural data	Balancing requirements	Balancing Energy: Available volumes	No	Yes	No	No	No	No	2005 - 2021
58	Balancing energy information Belgium	Elia Group	Network and infrastructural data	Balancing requirements	Balancing Energy: Activated volumes	No	Yes	No	No	No	No	2005 - 2021
59	Balancing energy information Belgium	Elia Group	Network and infrastructural data	Balancing requirements	Volume of balancing capacity required	No	Yes	No	No	No	No	2005 - 2021
60	Balancing energy information Belgium	Elia Group	Network and infrastructural data	Balancing requirements	Results of the auctions held to provide balancing capacity	No	Yes	No	No	No	No	2005 - 2021
61	Balancing energy information Belgium	Elia Group	Network and infrastructural data	Balancing requirements	Volume needs of FCR and aFRR Capacity	No	Yes	No	No	No	No	2021; 2022
62	Carbon Pricing Dashboard	The World Bank	Electricity supply-side data	Thermal generation; CONE/CORP	Carbon price	Yes	Yes	Yes	Yes	Yes	Yes	1990 - 2021
63	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity demand-side data	Industrial DSR; CONE/CORP	Hurdle rate for the commissioning of new DSR capacities	Yes	Yes	Yes	Yes	Yes	Yes	2018

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
53	Balancing energy information Belgium	Elia Group	aFRR	minute	by country		automatic Frequency Restoration Reserve	Link
54	Balancing energy information Belgium	Elia Group	mFRR	minute	by country		manual Frequency Restoration Reserve	Link
55	Balancing energy information Belgium	Elia Group	Balancing energy activated	minute	by country			Link
56	Balancing energy information Belgium	Elia Group	Prices per product of the activated balancing energy per minute	minute	by country			Link
57	Balancing energy information Belgium	Elia Group	Balancing Energy: Available volumes	minute	by country			Link
58	Balancing energy information Belgium	Elia Group	Balancing Energy: Activated volumes	minute	by country			Link
59	Balancing energy information Belgium	Elia Group	Volume of balancing capacity required	minute	by country			Link
60	Balancing energy information Belgium	Elia Group	Results of the auctions held to provide balancing capacity	minute	by country			Link
61	Balancing energy information Belgium	Elia Group	Volume needs of FCR and aFRR Capacity	target years	by country			Link
62	Carbon Pricing Dashboard	The World Bank	Carbon price	yearly	by country	frequently updated	Overview of carbon price policy and carbon price	Link
63	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Hurdle rate for the commissioning of new DSR capacities	target years	by country			Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
64	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	Hurdle rate for the commissioning of new CCGT capacities	Yes	Yes	Yes	Yes	Yes	Yes	2020; 2025
65	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	Hurdle rate for the commissioning of new OCGT capacities	Yes	Yes	Yes	Yes	Yes	Yes	2020; 2025
66	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	Hurdle rate for the commissioning of new Biomass capacities	Yes	Yes	Yes	Yes	Yes	Yes	2020; 2025
67	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	RES generation; CONE/CORP	Hurdle rate for the commissioning of new Wind onshore capacities	Yes	Yes	Yes	Yes	Yes	Yes	2020; 2025
68	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	RES generation; CONE/CORP	Hurdle rate for the commissioning of new Wind offshore capacities	Yes	Yes	Yes	Yes	Yes	Yes	2020; 2025
69	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	RES generation; CONE/CORP	Hurdle rate for the commissioning of new Solar PV capacities	Yes	Yes	Yes	Yes	Yes	Yes	2020; 2025
70	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	RES generation; CONE/CORP	Hurdle rate for the commissioning of new Hydropower capacities	Yes	Yes	Yes	Yes	Yes	Yes	2020; 2025

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
64	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies		Hurdle rate for the commissioning of new CCGT capacities	target years	by country			Link
65	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies		Hurdle rate for the commissioning of new OCGT capacities	target years	by country			Link
66	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies		Hurdle rate for the commissioning of new Biomass capacities	target years	by country			Link
67	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies		Hurdle rate for the commissioning of new Wind onshore capacities	target years	by country			Link
68	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies		Hurdle rate for the commissioning of new Wind offshore capacities	target years	by country			Link
69	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies		Hurdle rate for the commissioning of new Solar PV capacities	target years	by country			Link
70	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies		Hurdle rate for the commissioning of new Hydropower capacities	target years	by country			Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
71	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	RES generation; CONE/CORP	Hurdle rate for the commissioning of new other RES capacities	Yes	Yes	Yes	Yes	Yes	Yes	2020; 2025
72	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	Levelised Cost estimates for CCGT	Yes	Yes	Yes	Yes	Yes	Yes	2016; 2018; 2020; 2025; 2030
73	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	Levelised Cost estimates for OCGT	Yes	Yes	Yes	Yes	Yes	Yes	2016; 2018; 2020; 2025; 2030
74	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	Levelised Cost estimates for Biomass	Yes	Yes	Yes	Yes	Yes	Yes	2016; 2018; 2020; 2025; 2030
75	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	RES generation; CONE/CORP	Levelised Cost estimates for offshore Wind	Yes	Yes	Yes	Yes	Yes	Yes	2016; 2018; 2020; 2025; 2030
76	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	RES generation; CONE/CORP	Levelised Cost estimates for onshore Wind	Yes	Yes	Yes	Yes	Yes	Yes	2016; 2018; 2020; 2025; 2030
77	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	RES generation; CONE/CORP	Levelised Cost estimates for large scale PV	Yes	Yes	Yes	Yes	Yes	Yes	2016; 2018; 2020; 2025; 2030

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	A	B	M	N	O	P	Q	R
1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
71	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies		Hurdle rate for the commissioning of new other RES capacities	target years	by country			Link
72	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies		Levelised Cost estimates for CCGT	target years	by country			Link
73	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies		Levelised Cost estimates for OCGT	target years	by country			Link
74	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies		Levelised Cost estimates for Biomass	target years	by country			Link
75	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies		Levelised Cost estimates for offshore Wind	target years	by country			Link
76	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies		Levelised Cost estimates for onshore Wind	target years	by country			Link
77	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies		Levelised Cost estimates for large scale PV	target years	by country			Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
78	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	Levelised Cost estimates for Nuclear Power	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
79	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	Levelised Cost estimates for Coal	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
80	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	Levelised Cost estimates for Coal with CCS	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
81	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for CCGT	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
82	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for OCGT	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
83	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for Biomass	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
84	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	RES generation; CONE/CORP	CAPEX for offshore Wind	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
78	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Levelised Cost estimates for Nuclear Power	target years	by country			Link
79	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Levelised Cost estimates for Coal	target years	by country			Link
80	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Levelised Cost estimates for Coal with CCS	target years	by country			Link
81	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	CAPEX for CCGT	target years	by country			Link
82	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	CAPEX for OCGT	target years	by country			Link
83	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	CAPEX for Biomass	target years	by country			Link
84	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	CAPEX for offshore Wind	target years	by country			Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
85	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	RES generation; CONE/CORP	CAPEX for onshore Wind	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
86	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	RES generation; CONE/CORP	CAPEX for large scale PV	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
87	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for Nuclear Power	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
88	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for Coal	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
89	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for Coal with CCS	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
90	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for CCGT	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
91	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for OCGT	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
85	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	CAPEX for onshore Wind	target years	by country			Link
86	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	CAPEX for large scale PV	target years	by country			Link
87	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	CAPEX for Nuclear Power	target years	by country			Link
88	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	CAPEX for Coal	target years	by country			Link
89	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	CAPEX for Coal with CCS	target years	by country			Link
90	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	O&M costs for CCGT	target years	by country			Link
91	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	O&M costs for OCGT	target years	by country			Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
92	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for Biomass	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
93	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	RES generation; CONE/CORP	O&M costs for offshore Wind	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
94	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	RES generation; CONE/CORP	O&M costs for onshore Wind	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
95	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	RES generation; CONE/CORP	O&M costs for large scale PV	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
96	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for Nuclear Power	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
97	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for Coal	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025
98	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for Coal with CCS	Yes	Yes	Yes	Yes	Yes	Yes	2018; 2020; 2025

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
92	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	O&M costs for Biomass	target years	by country			Link
93	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	O&M costs for offshore Wind	target years	by country			Link
94	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	O&M costs for onshore Wind	target years	by country			Link
95	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	O&M costs for large scale PV	target years	by country			Link
96	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	O&M costs for Nuclear Power	target years	by country			Link
97	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	O&M costs for Coal	target years	by country			Link
98	Cost of Capital - Update for Electricity Generation, Storage and Demand Side Response Technologies	Europe Economics	O&M costs for Coal with CCS	target years	by country			Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
99	Data & Statistics IRENA	IRENA	Electricity supply-side data	RES generation	CAPEX of RE-technologies	Yes	Yes	Yes	Yes	Yes	Yes	2010 - 2020
100	Data & Statistics IRENA	IRENA	Electricity supply-side data	RES generation	OPEX of RE-technologies	Yes	Yes	Yes	Yes	Yes	Yes	2010 - 2020
101	Data & Statistics IRENA	IRENA	Electricity supply-side data	RES generation	WACC for RE-technologies	Yes	Yes	Yes	Yes	Yes	Yes	2010 - 2020
102	Data dictionary	ecad.eu	Electricity demand-side data	Electricity demand for space heating and cooling	Time series of air temperature	Yes	Yes	Yes	Yes	Yes	Yes	1890 - today
103	Data dictionary	ecad.eu	Electricity demand-side data	Electricity demand for space heating and cooling	Time series of humidity	Yes	Yes	Yes	Yes	Yes	Yes	1890 - today
104	Data dictionary	ecad.eu	Electricity supply-side data	RES generation	Times series of cloud cover	Yes	Yes	Yes	Yes	Yes	Yes	1890 - today
105	Data dictionary	ecad.eu	Electricity supply-side data	RES generation	Times series of global radiation	Yes	Yes	Yes	Yes	Yes	Yes	1890 - today
106	Data dictionary	ecad.eu	Electricity supply-side data	RES generation	Times series of precipitation	Yes	Yes	Yes	Yes	Yes	Yes	1890 - today
107	Data dictionary	ecad.eu	Electricity supply-side data	RES generation	Times series sea level pressure	Yes	Yes	Yes	Yes	Yes	Yes	1890 - today

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
99	Data & Statistics IRENA	IRENA	CAPEX of RE-technologies	yearly published article	by country; by country	Available for solar PV, wind on-/offshore, biomass, hydropower, geothermal, renewable heat costs, concentrated solar power		Link
100	Data & Statistics IRENA	IRENA	OPEX of RE-technologies	yearly published article	by country; by country	Available for solar PV, wind on-/offshore, biomass, hydropower, geothermal, renewable heat costs, concentrated solar power		Link
101	Data & Statistics IRENA	IRENA	WACC for RE-technologies	yearly published article	by country; by country	Available for solar PV, wind on-/offshore, biomass, hydropower, geothermal, renewable heat costs, concentrated solar power		Link
102	Data dictionary	ecad.eu	Time series of air temperature	daily	based on local meteorological stations	data availability depends on respective weather station		Link
103	Data dictionary	ecad.eu	Time series of humidity	daily	based on local meteorological stations	data availability depends on respective weather station		Link
104	Data dictionary	ecad.eu	Times series of cloud cover	daily	based on local meteorological stations	data availability depends on respective weather station		Link
105	Data dictionary	ecad.eu	Times series of global radiation	daily	based on local meteorological stations	data availability depends on respective weather station		Link
106	Data dictionary	ecad.eu	Times series of precipitation	daily	based on local meteorological stations	data availability depends on respective weather station		Link
107	Data dictionary	ecad.eu	Times series sea level pressure	daily	based on local meteorological stations	data availability depends on respective weather station		Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
108	Data dictionary	ecad.eu	Electricity demand-side data	Electricity demand for space heating and cooling	Times series of snow depth	Yes	Yes	Yes	Yes	Yes	Yes	1890 - today
109	Data dictionary	ecad.eu	Electricity supply-side data	RES generation	Times series of sunshine hours	Yes	Yes	Yes	Yes	Yes	Yes	1890 - today
110	Data dictionary	ecad.eu	Electricity supply-side data	RES generation	Times series wind direction	Yes	Yes	Yes	Yes	Yes	Yes	1890 - today
111	Data dictionary	ecad.eu	Electricity supply-side data	RES generation	Times series of wind gust	Yes	Yes	Yes	Yes	Yes	Yes	1890 - today
112	Data dictionary	ecad.eu	Electricity supply-side data	RES generation	Times series of wind speed	Yes	Yes	Yes	Yes	Yes	Yes	1890 - today
113	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Mechanical storage technology: storage duration at full power	Yes	Yes	Yes	Yes	Yes	Yes	constant variable

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
108	Data dictionary	ecad.eu	Times series of snow depth	daily	based on local meteorological stations	data availability depends on respective weather station		Link
109	Data dictionary	ecad.eu	Times series of sunshine hours	daily	based on local meteorological stations	data availability depends on respective weather station		Link
110	Data dictionary	ecad.eu	Times series wind direction	daily	based on local meteorological stations	data availability depends on respective weather station		Link
111	Data dictionary	ecad.eu	Times series of wind gust	daily	based on local meteorological stations	data availability depends on respective weather station		Link
112	Data dictionary	ecad.eu	Times series of wind speed	daily	based on local meteorological stations	data availability depends on respective weather station		Link
113	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Mechanical storage technology: storage duration at full power		by country	Available for Pumped Hydro Storage (PHS), Pumped Heat Electrical Storage (PHES), Adiabatic Compressed Air Energy Storage (ACAES), Compressed Air Energy Storage (CAES), Liquid Air Energy Storage (LAES) and Flywheel		Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
114	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Electro chemical storage technology: storage duration at full power	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
115	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Electrical storage technology: storage duration at full power	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
116	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Chemical storage technology: storage duration at full power	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
117	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Thermal storage technology: storage duration at full power	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
118	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Mechanical storage technology: CAPEX	Yes	Yes	Yes	Yes	Yes	Yes	2016; 2030

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	A	B	M	N	O	P	Q	R
1				Temporal	Spatial			
2	Database	Author	Data input	resolution	resolution	Remarks	Additional Description	Link
114	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electro chemical storage technology: storage duration at full power		by country	Available for Sodium Sulphur batteries, Lead Acid batteries, Sodium Nickel Chloride batteries, Lithium-ion batteries, Lithium-S batteries R&D, Lithium-Metal-Polymer batteries, Metal Air batteries R&D, Ni-Cd batteries, Ni-MH batteries, Na-ion batteries R&D, Redox flow batteries Zn Fe, Redox flow batteries Vanadium and Redox flow batteries Zn Br		Link
115	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electrical storage technology: storage duration at full power		by country	Available for Superconducting Magnetic Energy Storage (SMES) and Supercapacitor		Link
116	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Chemical storage technology: storage duration at full power		by country	Available for Power to Gas (H2), Power to Ammonia – Gasoline, Power to Methane and Power to Methanol + Gasoline		Link
117	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Thermal storage technology: storage duration at full power		by country	Available for Molten salts, Sensible Thermal Energy Storage (STES), Phase Change Material (PCM) and Thermochemical Storage (TCS)		Link
118	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Mechanical storage technology: CAPEX	target years	by country	Available for Pumped Hydro Storage (PHS), Pumped Heat Electrical Storage (PHES), Adiabatic Compressed Air Energy Storage (ACAES), Compressed Air Energy Storage (CAES), Liquid Air Energy Storage (LAES) and Flywheel		Link

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1	Database		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
119	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Electro chemical storage technology: CAPEX	Yes	Yes	Yes	Yes	Yes	Yes	2016; 2030
120	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Electrical storage technology: CAPEX	Yes	Yes	Yes	Yes	Yes	Yes	2016; 2030
121	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Chemical storage technology: CAPEX	Yes	Yes	Yes	Yes	Yes	Yes	2016; 2030
122	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Thermal storage technology: CAPEX	Yes	Yes	Yes	Yes	Yes	Yes	2016; 2030
123	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Mechanical storage technology: Round-trip efficiency	Yes	Yes	Yes	Yes	Yes	Yes	constant variable

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1				Temporal	Spatial			
2	Database	Author	Data input	resolution	resolution	Remarks	Additional Description	Link
119	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electro chemical storage technology: CAPEX	target years	by country	Available for Sodium Sulphur batteries, Lead Acid batteries, Sodium Nickel Chloride batteries, Lithium-ion batteries, Lithium-S batteries R&D, Lithium-Metal-Polymer batteries, Metal Air batteries R&D, Ni-Cd batteries, Ni-MH batteries, Na-ion batteries R&D, Redox flow batteries Zn Fe, Redox flow batteries Vanadium and Redox flow batteries Zn Br		Link
120	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electrical storage technology: CAPEX	target years	by country	Available for Superconducting Magnetic Energy Storage (SMES) and Supercapacitor		Link
121	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Chemical storage technology: CAPEX	target years	by country	Available for Power to Gas (H2), Power to Ammonia – Gasoline, Power to Methane and Power to Methanol + Gasoline		Link
122	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Thermal storage technology: CAPEX	target years	by country	Available for Molten salts, Sensible Thermal Energy Storage (STES), Phase Change Material (PCM) and Thermochemical Storage (TCS)		Link
123	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Mechanical storage technology: Round-trip efficiency		by country	Available for Pumped Hydro Storage (PHS), Pumped Heat Electrical Storage (PHES), Adiabatic Compressed Air Energy Storage (ACAES), Compressed Air Energy Storage (CAES), Liquid Air Energy Storage (LAES) and Flywheel		Link

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1	Database		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
124	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Electro chemical storage technology: Round-trip efficiency	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
125	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Electrical storage technology: Round-trip efficiency	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
126	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Chemical storage technology: Round-trip efficiency	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
127	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Thermal storage technology: Round-trip efficiency	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
128	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Chemical storage technology: Conversion efficiency	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
129	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Mechanical storage technology: Response time	Yes	Yes	Yes	Yes	Yes	Yes	constant variable

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	A	B	M	N	O	P	Q	R
1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
124	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electro chemical storage technology: Round-trip efficiency		by country	Available for Sodium Sulphur batteries, Lead Acid batteries, Sodium Nickel Chloride batteries, Lithium-ion batteries, Ni-Cd batteries, Ni-MH batteries, Redox flow batteries Vanadium and Redox flow batteries Zn Br		Link
125	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electrical storage technology: Round-trip efficiency		by country	Available for Superconducting Magnetic Energy Storage (SMES) and Supercapacitor		Link
126	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Chemical storage technology: Round-trip efficiency		by country	Available for Power to Gas (H2)		Link
127	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Thermal storage technology: Round-trip efficiency		by country	Available for Molten salts, Sensible Thermal Energy Storage (STES), Phase Change Material (PCM) and Thermochemical Storage (TCS)		Link
128	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Chemical storage technology: Conversion efficiency		by country	Available for Power to Gas (H2), Power to Ammonia - Gasoline, Power to Methane and Power to Methanol + Gasoline		Link
129	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Mechanical storage technology: Response time		by country	Available for Pumped Hydro Storage (PHS), Pumped Heat Electrical Storage (PHES), Adiabatic Compressed Air Energy Storage (ACAES), Compressed Air Energy Storage (CAES), Liquid Air Energy Storage (LAES) and Flywheel		Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
130	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Electro chemical storage technology: Response time	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
131	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Electrical storage technology: Response time	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
132	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Chemical storage technology: Response time	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
133	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Mechanical storage technology: storage capacity (project list)	Yes	Yes	Yes	Yes	Yes	Yes	

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	A	B	M	N	O	P	Q	R
1				Temporal	Spatial			
2	Database	Author	Data input	resolution	resolution	Remarks	Additional Description	Link
130			Electro chemical storage technology: Response time		by country	Available for Sodium Sulphur batteries, Lead Acid batteries, Sodium Nickel Chloride batteries, Lithium-ion batteries, Lithium-S batteries R&D, Lithium-Metal-Polymer batteries, Metal Air batteries R&D, Ni-Cd batteries, Ni-MH batteries, Na-ion batteries R&D, Redow flow batteries Zn Fe, Redox flow batteries Vanadium and Redox flow batteries Zn Br		
	Database of the European energy storage technologies and facilities							
131			Electrical storage technology: Response time		by country	Available for Superconducting Magnetic Energy Storage (SMES) and Supercapacitor		
	Database of the European energy storage technologies and facilities							
132			Chemical storage technology: Response time		by country	Available for Power to Gas (H2)		
	Database of the European energy storage technologies and facilities							
133			Mechanical storage technology: storage capacity (project list)	updated frequently	by country	Available for Pumped Hydro Storage (PHS), Pumped Heat Electrical Storage (PHES), Adiabatic Compressed Air Energy Storage (ACAES), Compressed Air Energy Storage (CAES), Liquid Air Energy Storage (LAES) and Flywheel		
	Database of the European energy storage technologies and facilities							

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1						Countries						
2	Database	Author	Category	RAA element	Data input	AT	BE	DE	FR	NL	LU	Years
134	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Electro chemical storage technology: storage capacity (project list)	Yes	Yes	Yes	Yes	Yes	Yes	
135	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Electrical storage technology: storage capacity (project list)	Yes	Yes	Yes	Yes	Yes	Yes	
136	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Chemical storage technology: storage capacity (project list)	Yes	Yes	Yes	Yes	Yes	Yes	
137	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Thermal storage technology: storage capacity (project list)	Yes	Yes	Yes	Yes	Yes	Yes	
138	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Installed behind the meter storage	Yes	No	Yes	Yes	No	No	

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	A	B	M	N	O	P	Q	R
1				Temporal	Spatial			
2	Database	Author	Data input	resolution	resolution	Remarks	Additional Description	Link
134	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electro chemical storage technology: storage capacity (project list)	updated frequently	by country	Available for Sodium Sulphur batteries, Lead Acid batteries, Sodium Nickel Chloride batteries, Lithium-ion batteries, Lithium-S batteries R&D, Lithium-Metal-Polymer batteries, Metal Air batteries R&D, Ni-Cd batteries, Ni-MH batteries, Na-ion batteries R&D, Redox flow batteries Zn Fe, Redox flow batteries Vanadium and Redox flow batteries Zn Br		Link
135	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electrical storage technology: storage capacity (project list)	updated frequently	by country	Available for Superconducting Magnetic Energy Storage (SMES) and Supercapacitor		Link
136	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Chemical storage technology: storage capacity (project list)	updated frequently	by country	Available for Power to Gas (H2), Power to Ammonia – Gasoline, Power to Methane and Power to Methanol + Gasoline		Link
137	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Thermal storage technology: storage capacity (project list)	updated frequently	by country	Available for Molten salts, Sensible Thermal Energy Storage (STES), Phase Change Material (PCM) and Thermochemical Storage (TCS)		Link
138	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Installed behind the meter storage	updated frequently	by country	Available for Molten salts, Sensible Thermal Energy Storage (STES), Phase Change Material (PCM) and Thermochemical Storage (TCS)		Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
139	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Mechanical storage technology: Energy Capacity (GWh)	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
140	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Electro chemical storage technology: Energy Capacity (GWh)	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
141	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Electrical storage technology: Energy Capacity (GWh)	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
142	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Chemical storage technology: Energy Capacity (GWh)	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
143	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Thermal storage technology: Energy Capacity (GWh)	Yes	Yes	Yes	Yes	Yes	Yes	constant variable

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
139	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Mechanical storage technology: Energy Capacity (GWh)		by country	Available for Pumped Hydro Storage (PHS), Pumped Heat Electrical Storage (PHES), Adiabatic Compressed Air Energy Storage (ACAES), Compressed Air Energy Storage (CAES), Liquid Air Energy Storage (LAES) and Flywheel	min-max capacity range per unit of installation	Link
140	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electro chemical storage technology: Energy Capacity (GWh)		by country	Available for Sodium Sulphur batteries, Lead Acid batteries, Sodium Nickel Chloride batteries, Lithium-ion batteries, Lithium-S batteries R&D, Lithium-Metal-Polymer batteries, Metal Air batteries R&D, Ni-Cd batteries, Ni-MH batteries, Na-ion batteries R&D, Redox flow batteries Zn Fe, Redox flow batteries Vanadium and Redox flow batteries Zn Br	min-max capacity range per unit of installation	Link
141	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electrical storage technology: Energy Capacity (GWh)		by country	Available for Superconducting Magnetic Energy Storage (SMES) and Supercapacitor	min-max capacity range per unit of installation	Link
142	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Chemical storage technology: Energy Capacity (GWh)		by country	Available for Power to Gas (H2), Power to Ammonia – Gasoline, Power to Methane and Power to Methanol + Gasoline	min-max capacity range per unit of installation	Link
143	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Thermal storage technology: Energy Capacity (GWh)		by country	Available for Molten salts, Sensible Thermal Energy Storage (STES), Phase Change Material (PCM) and Thermochemical Storage (TCS)	min-max capacity range per unit of installation	Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
144	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electricity supply-side data	Battery storage units	Mechanical storage technology: Power installed capacity (MW)	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
145					Electro chemical storage technology: Power installed capacity (MW)	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
146					Electrical storage technology: Power installed capacity (MW)	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
147					Chemical storage technology: Power installed capacity (MW)	Yes	Yes	Yes	Yes	Yes	Yes	constant variable
148					Thermal storage technology: Power installed capacity (MW)	Yes	Yes	Yes	Yes	Yes	Yes	constant variable

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks		Link
2								
144	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Mechanical storage technology: Power installed capacity (MW)		by country	Available for Pumped Hydro Storage (PHS), Pumped Heat Electrical Storage (PHES), Adiabatic Compressed Air Energy Storage (ACAES), Compressed Air Energy Storage (CAES), Liquid Air Energy Storage (LAES) and Flywheel	min-max capacity range per unit of installation	Link
145	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electro chemical storage technology: Power installed capacity (MW)		by country	Available for Sodium Sulphur batteries, Lead Acid batteries, Sodium Nickel Chloride batteries, Lithium-ion batteries, Lithium-S batteries R&D, Lithium-Metal-Polymer batteries, Metal Air batteries R&D, Ni-Cd batteries, Ni-MH batteries, Na-ion batteries R&D, Redox flow batteries Zn Fe, Redox flow batteries Vanadium and Redox flow batteries Zn Br	min-max capacity range per unit of installation	Link
146	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Electrical storage technology: Power installed capacity (MW)		by country	Available for Superconducting Magnetic Energy Storage (SMES) and Supercapacitor	min-max capacity range per unit of installation	Link
147	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Chemical storage technology: Power installed capacity (MW)		by country	Available for Power to Gas (H2), Power to Ammonia – Gasoline, Power to Methane and Power to Methanol + Gasoline	min-max capacity range per unit of installation	Link
148	Database of the European energy storage technologies and facilities	Directorate-General for Energy - EU Commission	Thermal storage technology: Power installed capacity (MW)		by country	Available for Molten salts, Sensible Thermal Energy Storage (STES), Phase Change Material (PCM) and Thermochemical Storage (TCS)	min-max capacity range per unit of installation	Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
149	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for CCGT	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
150	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for OCGT	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
151	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for Biomass	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
152	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	RES generation; CONE/CORP	CAPEX for offshore Wind	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
153	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	RES generation; CONE/CORP	CAPEX for onshore Wind	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
154	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	RES generation; CONE/CORP	CAPEX for large scale PV	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
155	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for Nuclear Power	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
156	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for Coal	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
157	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for Coal with CCS	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
158	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for CCGT	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
159	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for OCGT	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
160	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for Biomass	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
161	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	RES generation; CONE/CORP	O&M costs for offshore Wind	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
162	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	RES generation; CONE/CORP	O&M costs for onshore Wind	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
163	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	RES generation; CONE/CORP	O&M costs for large scale PV	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
164	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for Nuclear Power	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
165	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for Coal	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040
166	ELECTRICITY GENERATION COSTS 2020	BEIS	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for Coal with CCS	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030; 2035; 2040

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
149	ELECTRICITY GENERATION COSTS 2020	BEIS	CAPEX for CCGT	target years	by country			Link
150	ELECTRICITY GENERATION COSTS 2020	BEIS	CAPEX for OCGT	target years	by country			Link
151	ELECTRICITY GENERATION COSTS 2020	BEIS	CAPEX for Biomass	target years	by country			Link
152	ELECTRICITY GENERATION COSTS 2020	BEIS	CAPEX for offshore Wind	target years	by country			Link
153	ELECTRICITY GENERATION COSTS 2020	BEIS	CAPEX for onshore Wind	target years	by country			Link
154	ELECTRICITY GENERATION COSTS 2020	BEIS	CAPEX for large scale PV	target years	by country			Link
155	ELECTRICITY GENERATION COSTS 2020	BEIS	CAPEX for Nuclear Power	target years	by country			Link
156	ELECTRICITY GENERATION COSTS 2020	BEIS	CAPEX for Coal	target years	by country			Link
157	ELECTRICITY GENERATION COSTS 2020	BEIS	CAPEX for Coal with CCS	target years	by country			Link
158	ELECTRICITY GENERATION COSTS 2020	BEIS	O&M costs for CCGT	target years	by country			Link
159	ELECTRICITY GENERATION COSTS 2020	BEIS	O&M costs for OCGT	target years	by country			Link
160	ELECTRICITY GENERATION COSTS 2020	BEIS	O&M costs for Biomass	target years	by country			Link
161	ELECTRICITY GENERATION COSTS 2020	BEIS	O&M costs for offshore Wind	target years	by country			Link
162	ELECTRICITY GENERATION COSTS 2020	BEIS	O&M costs for onshore Wind	target years	by country			Link
163	ELECTRICITY GENERATION COSTS 2020	BEIS	O&M costs for large scale PV	target years	by country			Link
164	ELECTRICITY GENERATION COSTS 2020	BEIS	O&M costs for Nuclear Power	target years	by country			Link
165	ELECTRICITY GENERATION COSTS 2020	BEIS	O&M costs for Coal	target years	by country			Link
166	ELECTRICITY GENERATION COSTS 2020	BEIS	O&M costs for Coal with CCS	target years	by country			Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
167	ELIA Balancing Report	Elia Group	Network and infrastructural data	Balancing requirements	aFRR requirements	No	Yes	No	No	No	No	2018; 2019
168	ELIA Balancing Report	Elia Group	Network and infrastructural data	Balancing requirements	mFRR requirements	No	Yes	No	No	No	No	2018; 2019
169	ELIA Balancing Report	Elia Group	Network and infrastructural data	Balancing requirements	Total FRR requirements	No	Yes	No	No	No	No	2018; 2019
170	EMHIRES dataset Part I: Wind power generation	European Meteorological	Electricity supply-side data	RES generation	Time series of solar PV generation	Yes	Yes	Yes	Yes	Yes	Yes	1986 - 2015
171	EMHIRES dataset Part II Solar power generation	European Meteorological	Electricity supply-side data	RES generation	Time series of wind power generation	Yes	Yes	Yes	Yes	Yes	Yes	1986 - 2015
172	Energiedaten: Gesamtausgabe	BMWI	Electricity demand-side data	Conventional electricity demand	Electricity demand agriculture	No	No	Yes	No	No	No	1990 - 2020
173	Energiedaten: Gesamtausgabe	BMWI	Electricity demand-side data	Conventional electricity demand	Electricity demand commercial/service	No	No	Yes	No	No	No	1990 - 2020
174	Energiedaten: Gesamtausgabe	BMWI	Electricity demand-side data	Conventional electricity demand	Electricity demand households	No	No	Yes	No	No	No	1990 - 2020
175	Energiedaten: Gesamtausgabe	BMWI	Electricity demand-side data	Conventional electricity demand	Electricity demand industry	No	No	Yes	No	No	No	1990 - 2020

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
167	ELIA Balancing Report	Elia Group	aFRR requirements	report published every 2 years	by country	in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	automatic Frequency Restoration Reserve	Link
168	ELIA Balancing Report	Elia Group	mFRR requirements	report published every 2 years	by country	in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	manual Frequency Restoration Reserve	Link
169	ELIA Balancing Report	Elia Group	Total FRR requirements	report published every 2 years	by country	in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing		Link
170	EMHIRES dataset Part I: Wind power generation	European Meteorological	Time series of solar PV generation	hourly	data available on country, NUTS1 and NUTS2 level	data available on country, NUTS1 and NUTS2 level		Link
171	EMHIRES dataset Part II Solar power generation	European Meteorological	Time series of wind power generation	hourly	data available on country, NUTS1 and NUTS2 level	data available on country, NUTS1 and NUTS2 level		Link
172	Energiedaten: Gesamtausgabe	BMWI	Electricity demand agriculture	yearly	by country		Time series of demand in agriculture sector	Link
173	Energiedaten: Gesamtausgabe	BMWI	Electricity demand commercial/service	yearly	by country		Time series of demand in commercial/service sector	Link
174	Energiedaten: Gesamtausgabe	BMWI	Electricity demand households	yearly	by country		Time series of demand in household sector	Link
175	Energiedaten: Gesamtausgabe	BMWI	Electricity demand industry	yearly	by country		Time series of demand in industry sector	Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
176	Energiedaten: Gesamtausgabe	BMWI	Electricity supply-side data	Thermal generation	Powerplant self-consumption	No	No	Yes	No	No	No	1990 - 2020
177	Energiedaten: Gesamtausgabe	BMWI	Electricity demand-side data	Conventional electricity demand	Electricity demand transportation	No	No	Yes	No	No	No	1990 - 2020
178	Energiedaten: Gesamtausgabe	BMWI	Electricity supply-side data	Thermal generation; CONE/CORP	Cost for fuels	No	No	Yes	No	No	No	1990 - 2020
179	Energy Statistics	STATBEL	Electricity demand-side data	Conventional electricity demand	Electricity demand industry	No	Yes	No	No	No	No	1990 - 2019
180	Energy Statistics	STATBEL	Electricity supply-side data	Thermal generation	Powerplant self-consumption	No	Yes	No	No	No	No	1990 - 2019
181	Energy Statistics	STATBEL	Electricity supply-side data	Thermal generation; CONE/CORP	Cost for fuels	No	Yes	No	No	No	No	1990 - 2019
182	Energy Statistics	STATBEL	Electricity supply-side data	RES generation	Generation biomass	No	Yes	No	No	No	No	1990 - 2019
183	Energy Statistics	STATBEL	Electricity supply-side data	RES generation	Generation hydro	No	Yes	No	No	No	No	1990 - 2019
184	Energy Statistics	STATBEL	Electricity supply-side data	RES generation	Generation hydro storage	No	Yes	No	No	No	No	1990 - 2019
185	Energy Statistics	STATBEL	Electricity supply-side data	RES generation	Generation PV	No	Yes	No	No	No	No	1990 - 2019
186	Energy Statistics	STATBEL	Electricity supply-side data	RES generation	Generation waste	No	Yes	No	No	No	No	1990 - 2019
187	Energy Statistics	STATBEL	Electricity supply-side data	RES generation	Generation wind	No	Yes	No	No	No	No	1990 - 2019
188	ENTSO-E Balancing Report	ENTSO-E	Network and infrastructural data	Balancing requirements	Balancing reserve	Yes	Yes	Yes	Yes	Yes	Yes	2018 - 2019
189	ENTSO-E HVDC Utilisation and Unavailability Statistics 2020	ENTSO-E	Network and infrastructural data	Cross-border trade modelling (between modelled zones)	Unplanned outage rate HVDC interconnections	No	No	Yes	No	Yes	No	2020

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1	Database Author		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
176	Energiedaten: Gesamtausgabe	BMWI	Powerplant self-consumption	yearly	by country		Time series of demand by powerplants	Link
177	Energiedaten: Gesamtausgabe	BMWI	Electricity demand transportation	yearly	by country		Time series of demand by transportation	Link
178	Energiedaten: Gesamtausgabe	BMWI	Cost for fuels	yearly	by country		Wholesale price for hard coal and natural gas plus transportation cost.	Link
179	Energy Statistics	STATBEL	Electricity demand industry	yearly	by country	report published every year	Time series of demand in industry sector	Link
180	Energy Statistics	STATBEL	Powerplant self-consumption	yearly	by country	report published every year	Time series of demand by powerplants	Link
181	Energy Statistics	STATBEL	Cost for fuels	yearly	by country	report published every year	Wholesale price for hard coal and natural gas plus transportation cost.	Link
182	Energy Statistics	STATBEL	Generation biomass	yearly	by country	report published every year		Link
183	Energy Statistics	STATBEL	Generation hydro	yearly	by country	report published every year		Link
184	Energy Statistics	STATBEL	Generation hydro storage	yearly	by country	report published every year		Link
185	Energy Statistics	STATBEL	Generation PV	yearly	by country	report published every year		Link
186	Energy Statistics	STATBEL	Generation waste	yearly	by country	report published every year		Link
187	Energy Statistics	STATBEL	Generation wind	yearly	by country	report published every year		Link
188	ENTSO-E Balancing Report	ENTSO-E	Balancing reserve	report published every 2 years	by country	Report includes numbers for RR, FRR, FCR for the respective countries; in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing		Link
189	ENTSO-E HVDC Utilisation and Unavailability Statistics 2020	ENTSO-E	Unplanned outage rate HVDC interconnections	target year	unit based	Data covers "Nordic Countries"		Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
190	Eurostat Database	Eurostat	Electricity demand-side data	Electricity demand for space heating and cooling	Cooling and heating degree days	Yes	Yes	Yes	Yes	Yes	Yes	1979 - 2020
191	Eurostat Database	Eurostat	Electricity demand-side data	Conventional electricity demand	Electricity demand households	Yes	Yes	Yes	Yes	Yes	Yes	2009 - 2020
192	Eurostat Database	Eurostat	Electricity demand-side data	Conventional electricity demand	Electricity demand industry	Yes	Yes	Yes	Yes	Yes	Yes	2009 - 2020
193	Eurostat Database	Eurostat	Electricity demand-side data	Conventional electricity demand; Electricity demand of EV	Electricity demand road transportation	Yes	Yes	Yes	Yes	Yes	Yes	2009 - 2020
194	Eurostat Database	Eurostat	Electricity demand-side data	Conventional electricity demand	Electricity demand commercial/service	Yes	Yes	Yes	Yes	Yes	Yes	2009 - 2020
195	Eurostat Database	Eurostat	Electricity demand-side data	Conventional electricity demand	Electricity demand transportation	Yes	Yes	Yes	Yes	Yes	Yes	2009 - 2020
196	Eurostat Energy Balances	Eurostat	Electricity demand-side data	Conventional electricity demand	Network losses	Yes	Yes	Yes	Yes	Yes	Yes	2010 - 2019
197	FfE Open Data Platform	FfE	Electricity demand-side data	Large-scale PtX	Regionalization Factors for PtH	Yes	Yes	Yes	Yes	Yes	Yes	

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
190	Eurostat Database	Eurostat	Cooling and heating degree days	yearly; monthly	by country	Cooling and heating degree days by country. Online data code: NRG_CHDD_A		Link
191	Eurostat Database	Eurostat	Electricity demand households	yearly	by country	Final energy consumption in households by type of fuel. Online data code: ten00125		Link
192	Eurostat Database	Eurostat	Electricity demand industry	yearly	by country	Final energy consumption in industry by type of fuel. Online data code: ten00129		Link
193	Eurostat Database	Eurostat	Electricity demand road transportation	yearly	by country	Final energy consumption in road transport by type of fuel. Online data code: ten00127	Final energy consumption in road transport covers the energy consumption of the following road transport modes: scooters, motorcycles, tricycles, quads, cars, vans, mini-buses, buses, truck and other on-road vehicles (for example: snow plows, fire trucks, ambulances, etc.).	Link
194	Eurostat Database	Eurostat	Electricity demand commercial/service	yearly	by country	Final energy consumption in services by type of fuel. Online data code: ten00128		Link
195	Eurostat Database	Eurostat	Electricity demand transportation	yearly	by country	Final energy consumption in transport by type of fuel. Online data code: ten00126	Final energy consumption in transport covers the energy consumption of the following transport modes: road transport (cars, buses, trucks, etc), rail transport (trains, metro, trams, etc.), domestic aviation, domestic navigation and pipeline transport.	Link
196	Eurostat Energy Balances	Eurostat	Network losses	yearly published report	by country			Link
197	FfE Open Data Platform	FfE	Regionalization Factors for PtH		NUTS-2			Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
198	FfE Open Data Platform	FfE	Electricity demand-side data	Conventional electricity demand	Load curves of the private household sector	Yes	Yes	Yes	Yes	Yes	Yes	2020; 2025; 2030; 2035; 2040; 2045; 2050
199	FfE Open Data Platform	FfE	Electricity demand-side data	Conventional electricity demand	Load curves of the industry	Yes	Yes	Yes	Yes	Yes	Yes	2020; 2025; 2030; 2035; 2040; 2045; 2050
200	FfE Open Data Platform	FfE	Electricity demand-side data	Conventional electricity demand	Load curves of the tertiary sector	Yes	Yes	Yes	Yes	Yes	Yes	2020; 2025; 2030; 2035; 2040; 2045; 2050
201	FfE Open Data Platform	FfE	Electricity demand-side data	Conventional electricity demand	Load curves of the transport sector	Yes	Yes	Yes	Yes	Yes	Yes	2020; 2025; 2030; 2035; 2040; 2045; 2050
202	FfE Open Data Platform	FfE	Electricity supply-side data	RES generation	variable RES generation potentials	Yes	Yes	Yes	Yes	Yes	Yes	2012
203	FfE Open Data Platform	FfE	Electricity supply-side data	RES generation	Time series of wind onshore	Yes	Yes	Yes	Yes	Yes	Yes	2012
204	FfE Open Data Platform	FfE	Electricity supply-side data	RES generation	Time series of PV	Yes	Yes	Yes	Yes	Yes	Yes	2012
205	GDP growth	The World Bank	Electricity demand-side data	Conventional electricity demand	Economic growth	Yes	Yes	Yes	Yes	Yes	Yes	1921 - 2020
206	Gesamtenergiebilanz Österreich	Statistik Austria	Electricity demand-side data	Conventional electricity demand	Electricity demand agriculture	Yes	No	No	No	No	No	1970 - 2020
207	Gesamtenergiebilanz Österreich	Statistik Austria	Electricity demand-side data	Conventional electricity demand	Electricity demand commercial/service	Yes	No	No	No	No	No	1970 - 2020
208	Gesamtenergiebilanz Österreich	Statistik Austria	Electricity demand-side data	Conventional electricity demand	Electricity demand households	Yes	No	No	No	No	No	1970 - 2020
209	Gesamtenergiebilanz Österreich	Statistik Austria	Electricity demand-side data	Conventional electricity demand	Electricity demand industry	Yes	No	No	No	No	No	1970 - 2020
210	Gesamtenergiebilanz Österreich	Statistik Austria	Electricity supply-side data	Thermal generation	Powerplant self-consumption	Yes	No	No	No	No	No	1970 - 2020
211	Gesamtenergiebilanz Österreich	Statistik Austria	Electricity demand-side data	Conventional electricity demand	Electricity demand transportation	Yes	No	No	No	No	No	1970 - 2020

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
198	FfE Open Data Platform	FfE	Load curves of the private household sector	hourly	NUTS-3		eXtremOS solidEU Scenario	Link
199	FfE Open Data Platform	FfE	Load curves of the industry	hourly	NUTS-3		eXtremOS solidEU Scenario	Link
200	FfE Open Data Platform	FfE	Load curves of the tertiary sector	hourly	NUTS-3		eXtremOS solidEU Scenario	Link
201	FfE Open Data Platform	FfE	Load curves of the transport sector	hourly	NUTS-3		eXtremOS solidEU Scenario	Link
202	FfE Open Data Platform	FfE	variable RES generation potentials		NUTS-3	For wind onshore, freestanding PV and PV on buildings		Link
203	FfE Open Data Platform	FfE	Time series of wind onshore	hourly	NUTS-3			Link
204	FfE Open Data Platform	FfE	Time series of PV	hourly	NUTS-3			Link
205	GDP growth	The World Bank	Economic growth	yearly	by country		Development of economic performance in terms of GDP	Link
206	Gesamtenergiebilanz Österreich	Statistik Austria	Electricity demand agriculture	yearly	by country		Time series of demand in agriculture sector	Link
207	Gesamtenergiebilanz Österreich	Statistik Austria	Electricity demand commercial/service	yearly	by country		Time series of demand in commercial/service sector	Link
208	Gesamtenergiebilanz Österreich	Statistik Austria	Electricity demand households	yearly	by country		Time series of demand in household sector	Link
209	Gesamtenergiebilanz Österreich	Statistik Austria	Electricity demand industry	yearly	by country		Time series of demand in industry sector	Link
210	Gesamtenergiebilanz Österreich	Statistik Austria	Powerplant self-consumption	yearly	by country		Time series of demand by powerplants	Link
211	Gesamtenergiebilanz Österreich	Statistik Austria	Electricity demand transportation	yearly	by country		Time series of demand by transportation	Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
212	Gesamtenergiebilanz Österreich	Statistik Austria	Electricity demand-side data	Conventional electricity demand	Economic growth relative to energy consumption	Yes	No	No	No	No	No	1970 - 2020
213	Heating Market Report	ehi.eu	Electricity demand-side data	Electricity demand for space heating and cooling	Type and number of domestic heating systems	Yes	Yes	Yes	Yes	Yes	No	2015; 2017
214	IEA Data explorer	IEA	Electricity supply-side data	RES generation	Total RES generation	Yes	Yes	Yes	Yes	Yes	Yes	2010 - today
215	IEA Data explorer	IEA	Electricity supply-side data	Thermal generation	Total fossil generation	Yes	Yes	Yes	Yes	Yes	Yes	2010 - today
216	IEA Data explorer	IEA	Network and infrastructural data	Cross-border trade modelling (between modelled zones); Exchanges with non-explicitly modelled systems	Total imports	Yes	Yes	Yes	Yes	Yes	Yes	2010 - today
217	IEA Data explorer	IEA	Network and infrastructural data	Cross-border trade modelling (between modelled zones); Exchanges with non-explicitly modelled systems	Total exports	Yes	Yes	Yes	Yes	Yes	Yes	2010 - today
218	IEA Data explorer	IEA	Electricity demand-side data	Conventional electricity demand	Network losses	Yes	Yes	Yes	Yes	Yes	Yes	2010 - today
219	IEA Data explorer	IEA	Electricity demand-side data	Conventional electricity demand	Final electricity consumption	Yes	Yes	Yes	Yes	Yes	Yes	2010 - today
220	Jahresdurchschnittspreise und -steuern für die wichtigsten Energieträger	Statistik Austria	Electricity supply-side data	Thermal generation; CONE/CORP	Cost for fuels	Yes	No	No	No	No	No	

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
212	Gesamtenergiebilanz Österreich	Statistik Austria	Economic growth relative to energy consumption	yearly	by country		Development of economic performance in relation to Energy consumption	Link
213	Heating Market Report	ehi.eu	Type and number of domestic heating systems	report published in 2020 for the first time	by country	Types include: Liquid fuel non-condensing boilers, Gaseous fuel non-condensing boilers, Liquid fuel condensing boilers, Gaseous fuel condensing boilers, Heat pumps, Biomass boilers, Others		Link
214	IEA Data explorer	IEA	Total RES generation	monthly; updated monthly	by country			Link
215	IEA Data explorer	IEA	Total fossil generation	monthly; updated monthly	by country			Link
216	IEA Data explorer	IEA	Total imports	monthly; updated monthly	by country			Link
217	IEA Data explorer	IEA	Total exports	monthly; updated monthly	by country			Link
218	IEA Data explorer	IEA	Network losses	monthly; updated monthly	by country			Link
219	IEA Data explorer	IEA	Final electricity consumption	monthly; updated monthly	by country			Link
220	Jahresdurchschnittspreise und -steuern für die wichtigsten Energieträger	Statistik Austria	Cost for fuels	yearly	by country		Wholesale price for hard coal and natural gas plus transportation cost	Link

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1	Database		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
221	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for CCGT	Yes	Yes	Yes	Yes	Yes	Yes	2021; 2030
222	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for OCGT	Yes	Yes	Yes	Yes	Yes	Yes	2021; 2031
223	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX for Biomass	Yes	Yes	Yes	Yes	Yes	Yes	2021; 2032
224	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	RES generation; CONE/CORP	CAPEX for offshore Wind	Yes	Yes	Yes	Yes	Yes	Yes	2021; 2032
225	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	RES generation; CONE/CORP	CAPEX for onshore Wind	Yes	Yes	Yes	Yes	Yes	Yes	2021; 2032
226	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	RES generation; CONE/CORP	CAPEX for small scale PV	Yes	Yes	Yes	Yes	Yes	Yes	2021; 2032
227	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	RES generation; CONE/CORP	CAPEX for large scale PV	Yes	Yes	Yes	Yes	Yes	Yes	2021; 2032
228	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for CCGT	Yes	Yes	Yes	Yes	Yes	Yes	2021; 2032
229	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for OCGT	Yes	Yes	Yes	Yes	Yes	Yes	2021; 2032
230	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	Thermal generation; CONE/CORP	O&M costs for Biomass	Yes	Yes	Yes	Yes	Yes	Yes	2021; 2032
231	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	RES generation; CONE/CORP	O&M costs for offshore Wind	Yes	Yes	Yes	Yes	Yes	Yes	2021; 2032
232	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	RES generation; CONE/CORP	O&M costs for onshore Wind	Yes	Yes	Yes	Yes	Yes	Yes	2021; 2032

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
221	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	CAPEX for CCGT	target years	by country			Link
222	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	CAPEX for OCGT	target years	by country			Link
223	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	CAPEX for Biomass	target years	by country			Link
224	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	CAPEX for offshore Wind	target years	by country			Link
225	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	CAPEX for onshore Wind	target years	by country			Link
226	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	CAPEX for small scale PV	target years	by country			Link
227	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	CAPEX for large scale PV	target years	by country			Link
228	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	O&M costs for CCGT	target years	by country			Link
229	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	O&M costs for OCGT	target years	by country			Link
230	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	O&M costs for Biomass	target years	by country			Link
231	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	O&M costs for offshore Wind	target years	by country			Link
232	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	O&M costs for onshore Wind	target years	by country			Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
233	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	RES generation; CONE/CORP	O&M costs for small scale PV	Yes	Yes	Yes	Yes	Yes	Yes	2021; 2032
234	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	RES generation; CONE/CORP	O&M costs for large scale PV	Yes	Yes	Yes	Yes	Yes	Yes	2021; 2032
235	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	RES generation; CONE/CORP	Learning rate Solar PV	Yes	Yes	Yes	Yes	Yes	Yes	2021
236	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	RES generation; CONE/CORP	Learning rate Wind Energy	Yes	Yes	Yes	Yes	Yes	Yes	2021
237	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Electricity supply-side data	RES generation; CONE/CORP	Learning rate CSP	Yes	Yes	Yes	Yes	Yes	Yes	2021
238	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Total heating demand industry sector	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
239	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Space heating demand industry sector	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
240	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Conventional electricity demand	Water heating demand industry sector	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
241	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Conventional electricity demand	Process heating demand industry sector	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
242	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Space cooling demand industry sector	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
233	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	O&M costs for small scale PV	target years	by country			Link
234	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	O&M costs for large scale PV	target years	by country			Link
235	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Learning rate Solar PV	target years	by country			Link
236	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Learning rate Wind Energy	target years	by country			Link
237	LEVELIZED COST OF ELECTRICITY RENEWABLE ENERGY TECHNOLOGIES	Fraunhofer ISE	Learning rate CSP	target years	by country			Link
238	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Total heating demand industry sector	target years	by country	Data available for primary, final and useful energy		Link
239	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Space heating demand industry sector	target years	by country	Data available for primary, final and useful energy		Link
240	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Water heating demand industry sector	target years	by country	Data available for primary, final and useful energy		Link
241	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Process heating demand industry sector	target years	by country	Data available for primary, final and useful energy		Link
242	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Space cooling demand industry sector	target years	by country	Data available for primary, final and useful energy		Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
243	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Conventional electricity demand	Process cooling demand industry sector	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
244	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Conventional electricity demand	Total heating demand service sector	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
245	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Space heating demand service sector	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
246	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Conventional electricity demand	Water heating demand service sector	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
247	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Conventional electricity demand	Process heating demand service sector	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
248	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Space cooling demand service sector	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
249	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Conventional electricity demand	Process cooling demand service sector	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
250	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Conventional electricity demand	Total heating demand residential	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
251	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Space heating demand residential	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
243	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Process cooling demand industry sector	target years	by country	Data available for primary, final and useful energy		Link
244	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Total heating demand service sector	target years	by country			
245	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Space heating demand service sector	target years	by country			
246	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Water heating demand service sector	target years	by country			
247	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Process heating demand service sector	target years	by country			
248	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Space cooling demand service sector	target years	by country			
249	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Process cooling demand service sector	target years	by country			
250	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Total heating demand residential	target years	by country			
251	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Space heating demand residential	target years	by country	Data available for primary, final and useful energy		Link

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	A	B	C	D	E	F	G	H	I	J	K	L
1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
252	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Conventional electricity demand	Water heating demand residential	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
253	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Space cooling demand residential	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
254	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Installed capacity for building heat supply	Yes	Yes	Yes	Yes	Yes	Yes	2012
255	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Number of units installed for heat supply of buildings	Yes	Yes	Yes	Yes	Yes	Yes	2012
256	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Electrical efficiency of industrial heat applications	Yes	Yes	Yes	Yes	Yes	Yes	
257	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Percentage of citizens served by district heating	Yes	Yes	Yes	Yes	Yes	Yes	2013
258	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Electrical efficiency net of district heat applications	Yes	Yes	Yes	Yes	Yes	Yes	2016; 2020; 2030

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
252	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Water heating demand residential	target years	by country	Data available for primary, final and useful energy		Link
253	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Space cooling demand residential	target years	by country	Data available for primary, final and useful energy		Link
254	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Installed capacity for building heat supply	target years	by country	Data available for gas, oil, coal, CHP-IC, direct electric, biomass, solar thermal, heat pumps, individual biomass stove and air conditioning applications		Link
255	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Number of units installed for heat supply of buildings	target years	by country	Data available for gas, oil, coal, CHP-IC, direct electric, biomass, solar thermal, heat pumps, individual biomass stove and air conditioning applications		Link
256	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Electrical efficiency of industrial heat applications	constant variable	by country	Data available for CHP steam turbine, CHP gas turbine, CHP combined cycle and CHP ICE		Link
257	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Percentage of citizens served by district heating	target years	by country			Link
258	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)		Electrical efficiency net of district heat applications	target years	by country	Data available for ICE, steam turbine, gas, waste, boilers (gas, oil, coal, biomass, electric), solar thermal, heat pumps, geothermal, compression refrigerated, absorption cooling, district heating network		Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
259	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Total installed thermal capacity of different technologies for the supply of district heat	Yes	Yes	Yes	Yes	Yes	Yes	2012
260	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Installed capacity of large CHP applications of different sizes	Yes	Yes	Yes	Yes	Yes	Yes	2012
261	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Share of renewable energy in heat supply	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2030
262	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Electricity demand-side data	Electricity demand for space heating and cooling	Share of fossil energy in heat supply	Yes	Yes	Yes	Yes	Yes	Yes	2012; 2020; 2031
263	Market Report	ehpa - European heat pump association	Electricity demand-side data	Electricity demand for space heating and cooling	Number of heat pumps	Yes	Yes	Yes	Yes	Yes	No	2008 - 2020
264	METIS Technical Note T4	European Commission	Policy, regulatory and market design data	Market and regulatory constraints	Market design	Yes	Yes	Yes	Yes	Yes	Yes	2016
265	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Electricity supply-side data	Thermal generation	Generation biomass	No	No	Yes	No	No	No	5 year forecast
266	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Electricity supply-side data	Hydro modelling	Generation hydro	No	No	Yes	No	No	No	5 year forecast

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
259	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Total installed thermal capacity of different technologies for the supply of district heat	target years	by country	Data availability per technology depending on the country		Link
260	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Installed capacity of large CHP applications of different sizes	target years	by country	Data available for CHP steam turbine, CHP gas turbine, CHP combined cycle, CHP ICE and others (stirling engines, fuel cells, ORC)		Link
261	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Share of renewable energy in heat supply	target years	by country			Link
262	Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables)	Fraunhofer ISI	Share of fossil energy in heat supply	target years	by country			Link
263	Market Report	ehpa - European heat pump association	Number of heat pumps	yearly	by country	report published every year	Number of residential heat pumps in operation	Link
264	METIS Technical Note T4	European Commission	Market design		by country	report published in 2019; in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	Overview of European Electricity Market Designs	Link
265	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Generation biomass	yearly	regional resolution based on TSO control area	Data available for the different marketing forms pursuant to § 21a EEG 2021		Link
266	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Generation hydro	yearly	regional resolution based on TSO control area	Data available for the different marketing forms pursuant to § 21a EEG 2021		Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
267	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Electricity supply-side data	Hydro modelling	Generation hydro storage	No	No	Yes	No	No	No	5 year forecast
268	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Electricity supply-side data	RES generation	Generation PV	No	No	Yes	No	No	No	5 year forecast
269	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Electricity supply-side data	RES generation	Generation wind	No	No	Yes	No	No	No	5 year forecast
270	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Electricity supply-side data	Thermal generation	Generation Geothermal energy	No	No	Yes	No	No	No	5 year forecast
271	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Electricity supply-side data	Thermal generation	Generation other RES	No	No	Yes	No	No	No	5 year forecast
272	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Electricity supply-side data	Thermal generation	Installed capacity of biomass	No	No	Yes	No	No	No	5 year forecast
273	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Electricity supply-side data	Hydro modelling	Installed capacity of hydro	No	No	Yes	No	No	No	5 year forecast

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
267	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Generation hydro storage	yearly	regional resolution based on TSO control area	Data available for the different marketing forms pursuant to § 21a EEG 2021		Link
268	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Generation PV	yearly	regional resolution based on TSO control area	Data available for the different marketing forms pursuant to § 21a EEG 2021		Link
269	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Generation wind	yearly	regional resolution based on TSO control area	Data available for the different marketing forms pursuant to § 21a EEG 2021		Link
270	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Generation Geothermal energy	yearly	regional resolution based on TSO control area	Data available for the different marketing forms pursuant to § 21a EEG 2021		Link
271	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Generation other RES	yearly	regional resolution based on TSO control area	Data available for the different marketing forms pursuant to § 21a EEG 2021; Other RES includes landfill gas, sewage gas, mine gas		Link
272	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Installed capacity of biomass	yearly	regional resolution based on TSO control area	Data available for the different marketing forms pursuant to § 21a EEG 2021		Link
273	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Installed capacity of hydro	yearly	regional resolution based on TSO control area	Data available for the different marketing forms pursuant to § 21a EEG 2021		Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
274	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Electricity supply-side data	Hydro modelling	Installed capacity of hydro storage	No	No	Yes	No	No	No	5 year forecast
275	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Electricity supply-side data	RES generation	Installed capacity of PV	No	No	Yes	No	No	No	5 year forecast
276	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Electricity supply-side data	RES generation	Installed capacity of wind	No	No	Yes	No	No	No	5 year forecast
277	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Electricity supply-side data	RES generation	Installed capacity of geothermal energy	No	No	Yes	No	No	No	5 year forecast
278	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Electricity supply-side data	Thermal generation	Installed capacity of other RES	No	No	Yes	No	No	No	5 year forecast
279	NECP AT	BMNT	Electricity demand- side data	Conventional electricity demand	Net imports electricity	Yes	No	No	No	No	No	2015; 2020; 2030; 2040
280	NECP AT	BMNT	Electricity demand- side data	Conventional electricity demand	Electricity demand overall	Yes	No	No	No	No	No	2015; 2020; 2030; 2040
281	NECP AT	BMNT	Electricity demand- side data	Conventional electricity demand	Electricity demand agriculture	Yes	No	No	No	No	No	2015; 2020; 2030; 2040
282	NECP AT	BMNT	Electricity demand- side data	Conventional electricity demand	Electricity demand commercial/service	Yes	No	No	No	No	No	2015; 2020; 2030; 2040

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
274	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Installed capacity of hydro storage	yearly	regional resolution based on TSO control area	Data available for the different marketing forms pursuant to § 21a EEG 2021		Link
275	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Installed capacity of PV	yearly	regional resolution based on TSO control area	Data available for the different marketing forms pursuant to § 21a EEG 2021		Link
276	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Installed capacity of wind	yearly	regional resolution based on TSO control area	Data available for the different marketing forms pursuant to § 21a EEG 2021		Link
277	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Installed capacity of geothermal energy	yearly	regional resolution based on TSO control area	Data available for the different marketing forms pursuant to § 21a EEG 2021		Link
278	Mittelfristprognose	50Hertz, Amprion, TenneT, TransnetBW	Installed capacity of other RES	yearly	regional resolution based on TSO control area	Data available for the different marketing forms pursuant to § 21a EEG 2021; Other RES includes landfill gas, sewage gas, mine gas		Link
279	NECP AT	BMNT	Net imports electricity	target years	by country			Link
280	NECP AT	BMNT	Electricity demand overall	target years	by country			Link
281	NECP AT	BMNT	Electricity demand agriculture	target years	by country			Link
282	NECP AT	BMNT	Electricity demand commercial/service	target years	by country			Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
283	NECP AT	BMNT	Electricity demand-side data	Conventional electricity demand	Electricity demand households	Yes	No	No	No	No	No	2015; 2020; 2030; 2040
284	NECP AT	BMNT	Electricity demand-side data	Conventional electricity demand	Electricity demand industry	Yes	No	No	No	No	No	2015; 2020; 2030; 2040
285	NECP AT	BMNT	Electricity demand-side data	Conventional electricity demand	Electricity demand transportation	Yes	No	No	No	No	No	2015; 2020; 2030; 2040
286	NECP AT	BMNT	Electricity demand-side data	Conventional electricity demand	Energy efficiency	Yes	No	No	No	No	No	2030
287	NECP BE	Belgian Government	Electricity demand-side data	Conventional electricity demand	Electricity demand overall	No	Yes	No	No	No	No	2007; 2013 - 2017; 2030
288	NECP BE	Belgian Government	Electricity demand-side data	Conventional electricity demand	Electricity demand agriculture	No	Yes	No	No	No	No	2007; 2013 - 2017; 2031
289	NECP BE	Belgian Government	Electricity demand-side data	Conventional electricity demand	Electricity demand commercial/service	No	Yes	No	No	No	No	2007; 2013 - 2017; 2032
290	NECP BE	Belgian Government	Electricity demand-side data	Conventional electricity demand	Electricity demand households	No	Yes	No	No	No	No	2007; 2013 - 2017; 2033
291	NECP BE	Belgian Government	Electricity demand-side data	Conventional electricity demand	Electricity demand industry	No	Yes	No	No	No	No	2007; 2013 - 2017; 2034
292	NECP BE	Belgian Government	Electricity demand-side data	Conventional electricity demand	Electricity demand transportation	No	Yes	No	No	No	No	2007; 2013 - 2017; 2035
293	NECP BE	Belgian Government	Electricity demand-side data	Conventional electricity demand	Efficiency gains from renovating	No	Yes	No	No	No	No	2030
294	NECP DE	Bundesministerium für Wirtschaft und Klimaschutz	Electricity demand-side data	Conventional electricity demand	Electricity demand transportation	No	No	Yes	No	No	No	2020; 2025; 2030
295	NECP DE	Bundesministerium für Wirtschaft und Klimaschutz	Electricity demand-side data	Electricity demand for space heating and cooling	Electricity demand heating and cooling	No	No	Yes	No	No	No	2020; 2025; 2030

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
283	NECP AT	BMNT	Electricity demand households	target years	by country			Link
284	NECP AT	BMNT	Electricity demand industry	target years	by country			Link
285	NECP AT	BMNT	Electricity demand transportation	target years	by country			Link
286	NECP AT	BMNT	Energy efficiency	target years	by country	reference year 2015	Efficiency gains of electricity users (more efficient appliances, energy saving)	Link
287	NECP BE	Belgian Government	Electricity demand overall	target years	by country			Link
288	NECP BE	Belgian Government	Electricity demand agriculture	target years	by country			Link
289	NECP BE	Belgian Government	Electricity demand commercial/service	target years	by country			Link
290	NECP BE	Belgian Government	Electricity demand households	target years	by country			Link
291	NECP BE	Belgian Government	Electricity demand industry	target years	by country			Link
292	NECP BE	Belgian Government	Electricity demand transportation	target years	by country			Link
293	NECP BE	Belgian Government	Efficiency gains from renovating	target years	by country			Link
294	NECP DE	Bundesministerium für Wirtschaft und Klimaschutz	Electricity demand transportation	target years	by country		Demand as a percentage of total demand	Link
295	NECP DE	Bundesministerium für Wirtschaft und Klimaschutz	Electricity demand heating and cooling	target years	by country		Demand as a percentage of total demand	Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
296	NECP FR	DFBEW	Electricity demand-side data	Electricity demand for space heating and cooling	Renewable and recovered heat and cold in district heating	No	No	No	Yes	No	No	2030
297	NECP FR	DFBEW	Electricity demand-side data	Conventional electricity demand	Economic growth	No	No	No	Yes	No	No	2015 - 2050
298	NECP FR	DFBEW	Electricity demand-side data	Conventional electricity demand	Demographic development	No	No	No	Yes	No	No	2015 - 2050
299	NECP FR	DFBEW	Electricity demand-side data	Conventional electricity demand	Number of primary residences	No	No	No	Yes	No	No	2012; 2017; 2018; 2023
300	NECP FR	DFBEW	Electricity demand-side data	Electricity demand for space heating and cooling	Number of aerothermal heat pumps	No	No	No	Yes	No	No	2012; 2017; 2018; 2023
301	NECP FR	DFBEW	Electricity demand-side data	Electricity demand for space heating and cooling	Number of geothermal heat pumps	No	No	No	Yes	No	No	2012; 2017; 2018; 2023
302	NECP FR	DFBEW	Electricity demand-side data	Electricity demand for space heating and cooling	Share of each energy source for the heat supply	No	No	No	Yes	No	No	2023; 2028
303	NECP FR	DFBEW	Electricity demand-side data	Conventional electricity demand	Electricity demand commercial/service	No	No	No	Yes	No	No	2015; 2020; 2030; 2040; 2050
304	NECP FR	DFBEW	Electricity demand-side data	Conventional electricity demand	Electricity demand households	No	No	No	Yes	No	No	2015; 2020; 2030; 2040; 2050
305	NECP FR	DFBEW	Electricity demand-side data	Conventional electricity demand	Electricity demand industry	No	No	No	Yes	No	No	2015; 2020; 2030; 2040; 2050
306	NECP LU	Government of Luxembourg	Electricity demand-side data	Electricity demand of EV	Number of EV	No	No	No	No	No	Yes	2030
307	NECP LU	Government of Luxembourg	Electricity demand-side data	Conventional electricity demand	Efficiency gains from renovating	No	No	No	No	No	Yes	2030
308	NECP LU	Government of Luxembourg	Electricity demand-side data	Conventional electricity demand	Economic growth	No	No	No	No	No	Yes	2020; 2025; 2030; 2035; 2040
309	NECP LU	Government of Luxembourg	Electricity demand-side data	Conventional electricity demand	Demographic development	No	No	No	No	No	Yes	2020; 2025; 2030; 2035; 2040

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
296	NECP FR	DFBEW	Renewable and recovered heat and cold in district heating	target years	by country	reference year 2012		Link
297	NECP FR	DFBEW	Economic growth	in intervals of 5 to 15 years	by country		Development of economic performance in terms of GDP	Link
298	NECP FR	DFBEW	Demographic development	in intervals of 5 to 15 years	by country		Development of demographics	Link
299	NECP FR	DFBEW	Number of primary residences	target years	by country			Link
300	NECP FR	DFBEW	Number of aerothermal heat pumps	target years	by country		Number of Aerothermal heat pumps	Link
301	NECP FR	DFBEW	Number of geothermal heat pumps	target years	by country		Number of Geothermal heat pumps	Link
302	NECP FR	DFBEW	Share of each energy source for the heat supply	target years	by country			Link
303	NECP FR	DFBEW	Electricity demand commercial/service	target years	by country	bar chart		Link
304	NECP FR	DFBEW	Electricity demand households	target years	by country	bar chart		Link
305	NECP FR	DFBEW	Electricity demand industry	target years	by country	bar chart		Link
306	NECP LU	Government of Luxembourg	Number of EV	target years	by country		Share of EVs of total number of vehicles	Link
307	NECP LU	Government of Luxembourg	Efficiency gains from renovating		by country			Link
308	NECP LU	Government of Luxembourg	Economic growth		by country		Development of economic performance in terms of GDP	Link
309	NECP LU	Government of Luxembourg	Demographic development		by country		Development of demographics	Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
310	NECP LU	Government of Luxembourg	Electricity demand-side data	Conventional electricity demand	Electricity demand industry	No	No	No	No	No	Yes	2015; 2020; 2025; 2030; 2035; 2040
311	NECP LU	Government of Luxembourg	Electricity demand-side data	Conventional electricity demand	Electricity demand households	No	No	No	No	No	Yes	2015; 2020; 2025; 2030; 2035; 2040
312	NECP LU	Government of Luxembourg	Electricity demand-side data	Conventional electricity demand	Electricity demand commercial/service	No	No	No	No	No	Yes	2015; 2020; 2025; 2030; 2035; 2040
313	NECP LU	Government of Luxembourg	Electricity demand-side data	Conventional electricity demand	Electricity demand transportation	No	No	No	No	No	Yes	2015; 2020; 2025; 2030; 2035; 2040
314	NECP LU	Government of Luxembourg	Network and infrastructural data	Cross-border trade modelling (between modelled zones)	Interconnectors capacity	No	No	No	No	No	Yes	2016; 2020; 2030; 2040
315	NECP LU	Government of Luxembourg	Network and infrastructural data	Conventional electricity demand	Electricity demand overall	No	No	No	No	No	Yes	2020; 2025; 2030; 2035; 2040
316	NECP NL	Government of the Netherlands	Electricity demand-side data	Conventional electricity demand	Demographic development	No	No	No	No	Yes	No	2000; 2010; 2018; 2020; 2025; 2030
317	NECP NL	Government of the Netherlands	Electricity demand-side data	Conventional electricity demand	Number of primary residences	No	No	No	No	Yes	No	2000; 2010; 2018; 2020; 2025; 2030
318	NECP NL	Government of the Netherlands	Electricity demand-side data	Conventional electricity demand	Electricity demand overall	No	No	No	No	Yes	No	2014 - 2019; 2022; 2025
319	NECP NL	Government of the Netherlands	Electricity supply-side data	Thermal generation	Non-operational capacity	No	No	No	No	Yes	No	2014 - 2019; 2022; 2025
320	NECP NL	Government of the Netherlands	Network and infrastructural data	Cross-border trade modelling (between modelled zones)	Interconnectors capacity	No	No	No	No	Yes	No	2019; 2020; 2025; 2030
321	NECP NL	Government of the Netherlands	Electricity supply-side data	Thermal generation; CONE/CORP	Carbon price	No	No	No	No	Yes	No	2021 - 2030
322	PECD	ENTSO-E	Electricity supply-side data	RES generation	Time series of water inflow	Yes	Yes	Yes	Yes	Yes	Yes	2025: 2030
323	PECD	ENTSO-E	Electricity supply-side data	RES generation	Time series of solar irradiance	Yes	Yes	Yes	Yes	Yes	Yes	2025: 2030
324	PECD	ENTSO-E	Electricity supply-side data	RES generation	Time series of wind speed	Yes	Yes	Yes	Yes	Yes	Yes	2025: 2030

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
310	NECP LU	Government of Luxembourg	Electricity demand industry		by country			Link
311	NECP LU	Government of Luxembourg	Electricity demand households		by country			Link
312	NECP LU	Government of Luxembourg	Electricity demand commercial/service		by country			Link
313	NECP LU	Government of Luxembourg	Electricity demand transportation		by country		Time series of demand by transportation	Link
314	NECP LU	Government of Luxembourg	Interconnectors capacity		by country			Link
315	NECP LU	Government of Luxembourg	Electricity demand overall		by country		Time series of electricity demand	Link
316	NECP NL	Government of the Netherlands	Demographic development	target years	by country			Link
317	NECP NL	Government of the Netherlands	Number of primary residences	target years	by country			Link
318	NECP NL	Government of the Netherlands	Electricity demand overall	target years	by country		Time series of electricity demand	Link
319	NECP NL	Government of the Netherlands	Non-operational capacity	target years	by country			Link
320	NECP NL	Government of the Netherlands	Interconnectors capacity	target years	by country			Link
321	NECP NL	Government of the Netherlands	Carbon price	linear interpolation	by country		Tax on top of ETS	Link
322	PECD	ENTSO-E	Time series of water inflow	target years; hourly	by country			Link
323	PECD	ENTSO-E	Time series of solar irradiance	target years; hourly	by country		Full load hours	Link
324	PECD	ENTSO-E	Time series of wind speed	target years; hourly	by country		Full load hours	Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
325	PEMMDB	ENTSO-E	Electricity demand-side data	Industrial DSR	DSR potential	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
326	PEMMDB	ENTSO-E	Electricity demand-side data	Industrial DSR	DSR maximum activation capacity	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
327	PEMMDB	ENTSO-E	Electricity demand-side data	Industrial DSR	DSR maximum activation duration	Yes	Yes	Yes	Yes	Yes	Yes	N/A
328	PEMMDB	ENTSO-E	Electricity supply-side data	Battery storage units	Net capacity Battery storage (MW)	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
329	PEMMDB	ENTSO-E	Electricity supply-side data	Battery storage units	Net capacity Battery storage (MWh)	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
330	PEMMDB	ENTSO-E	Electricity demand-side data	Electricity demand of EV	Number of EV	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
331	PEMMDB	ENTSO-E	Electricity demand-side data	Conventional electricity demand	Electricity demand overall	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
332	PEMMDB	ENTSO-E	Electricity supply-side data	Thermal generation	Net capacity Nuclear	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
333	PEMMDB	ENTSO-E	Electricity supply-side data	Thermal generation	Net capacity Lignite	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
334	PEMMDB	ENTSO-E	Electricity supply-side data	Thermal generation	Net capacity Hard Coal	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
335	PEMMDB	ENTSO-E	Electricity supply-side data	Thermal generation	Net capacity Gas	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
336	PEMMDB	ENTSO-E	Electricity supply-side data	Thermal generation	Net capacity Oil	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
337	PEMMDB	ENTSO-E	Electricity supply-side data	RES generation	Net capacity Hydro	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
338	PEMMDB	ENTSO-E	Electricity supply-side data	RES generation	Net capacity Hydro Run of River & Pondage	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
							DSR activation curve, consisting of different price and volume bands, indicating minimum price required to activate the corresponding volumes of DSR.	
325	PEMMDB	ENTSO-E	DSR potential	target years	by country			Link
326	PEMMDB	ENTSO-E	DSR maximum activation capacity	target years	by country		Indicates the maximum DSR activation capacity for a volume band of the DSR activation function.	Link
327	PEMMDB	ENTSO-E	DSR maximum activation duration	target years	by country		Indicates the maximum DSR activation duration for a volume band of the DSR activation function.	Link
328	PEMMDB	ENTSO-E	Net capacity Battery storage (MW)	target years	by country		Installed non-market participating Battery storage capacities (output, MW)	Link
329	PEMMDB	ENTSO-E	Net capacity Battery storage (MWh)	target years	by country		Installed non-market participating Battery storage capacities (storage, MWh)	Link
330	PEMMDB	ENTSO-E	Number of EV	target years	by country	Reference year 2017	Number of electric vehicles.	Link
331	PEMMDB	ENTSO-E	Electricity demand overall	hourly	by country	Historical Data from 1982 - 2016	Time series of electricity demand	Link
332	PEMMDB	ENTSO-E	Net capacity Nuclear	target years	by country		Net installed capacity of nuclear energy	Link
333	PEMMDB	ENTSO-E	Net capacity Lignite	target years	by country		Net installed capacity of Lignite	Link
334	PEMMDB	ENTSO-E	Net capacity Hard Coal	target years	by country		Net installed capacity of Hard Coal	Link
335	PEMMDB	ENTSO-E	Net capacity Gas	target years	by country		Net installed capacity of Gas	Link
336	PEMMDB	ENTSO-E	Net capacity Oil	target years	by country		Net installed capacity of Oil	Link
337	PEMMDB	ENTSO-E	Net capacity Hydro	target years	by country		Net installed capacity of Hydro	Link
338	PEMMDB	ENTSO-E	Net capacity Hydro Run of River & Pondage	target years	by country		Net installed capacity of Hydro Run of River & Pondage	Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
339	PEMMDB	ENTSO-E	Electricity supply-side data	Hydro modelling	Net capacity Hydro Pump Storage Open Loop	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
340	PEMMDB	ENTSO-E	Electricity supply-side data	Hydro modelling	Net capacity Hydro Pump Storage Closed Loop	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
341	PEMMDB	ENTSO-E	Electricity supply-side data	Hydro modelling	Net capacity Hydro Pump Storage Open Loop	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
342	PEMMDB	ENTSO-E	Electricity supply-side data	Hydro modelling	Net capacity Hydro Pump Storage Closed Loop	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
343	PEMMDB	ENTSO-E	Electricity supply-side data	RES generation	Net capacity Wind onshore	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
344	PEMMDB	ENTSO-E	Electricity supply-side data	RES generation	Net capacity Wind offshore	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
345	PEMMDB	ENTSO-E	Electricity supply-side data	RES generation	Net capacity Solar thermal	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
346	PEMMDB	ENTSO-E	Electricity supply-side data	RES generation	Net capacity Solar photovoltaic	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
347	PEMMDB	ENTSO-E	Electricity supply-side data	Thermal generation	Net capacity Other RES	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
348	PEMMDB	ENTSO-E	Electricity supply-side data	Thermal generation	Net capacity Biofuel	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
349	PEMMDB	ENTSO-E	Electricity supply-side data	Hydro modelling	Energy storage Hydro - Run of River & Pondage	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
350	PEMMDB	ENTSO-E	Electricity supply-side data	Hydro modelling	Energy storage Hydro - Units with reservoir	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
351	PEMMDB	ENTSO-E	Electricity supply-side data	Battery storage units	Energy storage Batteries	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030

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1								
2	Database	Author	Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
339	PEMMDB	ENTSO-E	Net capacity Hydro Pump Storage Open Loop	target years	by country		Net installed capacity of Hydro Pump Storage Open Loop	Link
340	PEMMDB	ENTSO-E	Net capacity Hydro Pump Storage Closed Loop	target years	by country		Net installed capacity of Hydro Pump Storage Closed Loop	Link
341	PEMMDB	ENTSO-E	Net capacity Hydro Pump Storage Open Loop	target years	by country		Net installed capacity of Hydro Pump Storage Open Loop	Link
342	PEMMDB	ENTSO-E	Net capacity Hydro Pump Storage Closed Loop	target years	by country		Net installed capacity of Hydro Pump Storage Closed Loop	Link
343	PEMMDB	ENTSO-E	Net capacity Wind onshore	target years	by country		Net installed capacity of Wind onshore	Link
344	PEMMDB	ENTSO-E	Net capacity Wind offshore	target years	by country		Net installed capacity of Wind offshore	Link
345	PEMMDB	ENTSO-E	Net capacity Solar thermal	target years	by country		Net installed capacity of Solar thermal	Link
346	PEMMDB	ENTSO-E	Net capacity Solar photovoltaic	target years	by country		Net installed capacity of Solar photovoltaic	Link
347	PEMMDB	ENTSO-E	Net capacity Other RES	target years	by country		Net installed capacity of Other RES	Link
348	PEMMDB	ENTSO-E	Net capacity Biofuel	target years	by country		Net installed capacity of Biofuel	Link
349	PEMMDB	ENTSO-E	Energy storage Hydro - Run of River & Pondage	target years	by country		in MWh	Link
350	PEMMDB	ENTSO-E	Energy storage Hydro - Units with reservoir	target years	by country		in MWh	Link
351	PEMMDB	ENTSO-E	Energy storage Batteries	target years	by country		Market participating battery storage (MWh)	Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
352	PEMMDB	ENTSO-E	Network and infrastructural data	Balancing requirements	System reserve requirements for balancing energy	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
353	PEMMDB	ENTSO-E	Network and infrastructural data	Balancing requirements	Sum of reserve Hydro	Yes	Yes	Yes	Yes	Yes	Yes	2025; 2030
354	PEMMDB	ENTSO-E	Electricity supply-side data	Thermal generation	Capacity-weighted average must-run ratio	No	Yes	Yes	No	Yes	No	2025; 2030
355	PEMMDB	ENTSO-E	Electricity supply-side data	Thermal generation	Sum of must-run capacity (MW)	No	Yes	Yes	No	Yes	No	2025; 2030
356	PEMMDB	ENTSO-E	Electricity supply-side data	Thermal generation	Capacity-weighted Average Derating Ratio	No	No	No	No	No	No	2025; 2030
357	PEMMDB	ENTSO-E	Electricity supply-side data	Thermal generation	Sum of average derating capacity (MW)	No	No	No	No	No	No	2025; 2030
358	PEMMDB	ENTSO-E	Electricity supply-side data	Unplanned outages	Capacity-weighted Average Forced Outage Rate	Yes	Yes	Yes	Yes	Yes	No	2025; 2030
359	PEMMDB	ENTSO-E	Electricity supply-side data	Unplanned outages	Sum of Average Forced Outage capacity (MW)	Yes	Yes	Yes	Yes	Yes	No	2025; 2030
360	PEMMDB	ENTSO-E	Network and infrastructural data	Cross-border trade modelling (between modelled zones)	Net transfer capacity (HVAC)	Yes	Yes	Yes	Yes	Yes	No	2025; 2030
361	PEMMDB	ENTSO-E	Network and infrastructural data	Cross-border trade modelling (between modelled zones)	Net transfer capacity (HVDC)	No	Yes	Yes	Yes	Yes	Yes	2025; 2030
362	PEMMDB	ENTSO-E	Network and infrastructural data	Cross-border trade modelling (between modelled zones)	Import limit	No	No	No	No	Yes	No	2025; 2030
363	PEMMDB	ENTSO-E	Network and infrastructural data	Cross-border trade modelling (between modelled zones)	Export limit	No	No	No	No	Yes	No	2025; 2030

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
352	PEMMDB	ENTSO-E	System reserve requirements for balancing energy	target years	by country		Minimum system reserve requirements for balancing energy products FCR, FRR and RR.	Link
353	PEMMDB	ENTSO-E	Sum of reserve Hydro	target years	by country		Sum of reserve provided by HYDRO (MW)	Link
354	PEMMDB	ENTSO-E	Capacity-weighted average must-run ratio	target years	by country	The data in this sheet is only valid for the "National Estimates" scenario		Link
355	PEMMDB	ENTSO-E	Sum of must-run capacity (MW)	target years	by country	The data in this sheet is only valid for the "National Estimates" scenario	Must run capacity is $\text{mustrun_ratio} \times \text{capacity}$	Link
356	PEMMDB	ENTSO-E	Capacity-weighted Average Derating Ratio	target years	by country	The data in this sheet is only valid for the "National Estimates" scenario		Link
357	PEMMDB	ENTSO-E	Sum of average derating capacity (MW)	target years	by country	The data in this sheet is only valid for the "National Estimates" scenario	Effective capacity is $\text{derating_ratio} \times \text{capacity}$	Link
358	PEMMDB	ENTSO-E	Capacity-weighted Average Forced Outage Rate	target years	by country	The data in this sheet is only valid for the "National Estimates" scenario		Link
359	PEMMDB	ENTSO-E	Sum of Average Forced Outage capacity (MW)	target years	by country	The data in this sheet is only valid for the "National Estimates" scenario		Link
360	PEMMDB	ENTSO-E	Net transfer capacity (HVAC)	target years; hourly	by country		Net transfer capacity in High-Voltage-Alternating-Current	Link
361	PEMMDB	ENTSO-E	Net transfer capacity (HVDC)	target years; hourly	by country		Net transfer capacity in High-Voltage-Direct-Current	Link
362	PEMMDB	ENTSO-E	Import limit	target years; hourly	by country		Gross / Net import limit of energy resources	Link
363	PEMMDB	ENTSO-E	Export limit	target years; hourly	by country		Gross / Net export limit of energy resources	Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
364	PEMMDB	ENTSO-E	Network and infrastructural data	Cross-border trade modelling (between modelled zones)	Power transfer distribution factor (PTDF)	Yes	Yes	Yes	Yes	Yes	No	2021
365	PEMMDB	ENTSO-E	Network and infrastructural data	Cross-border trade modelling (between modelled zones)	Remaining available margin (MW)	Yes	Yes	Yes	Yes	Yes	No	2021
366	PEMMDB	ENTSO-E	Electricity demand-side data	Electricity demand for space heating and cooling	Hybrid Heat Pump COP	Yes	Yes	Yes	Yes	Yes	Yes	N/A
367	PEMMDB	ENTSO-E	Electricity demand-side data	Electricity demand for space heating and cooling	Heat Pump COP	Yes	Yes	Yes	Yes	Yes	Yes	N/A
368	PEMMDB	ENTSO-E	Electricity demand-side data	Conventional electricity demand	Air Conditioning COP	Yes	Yes	Yes	Yes	Yes	Yes	N/A
369	PEMMDB	ENTSO-E	Electricity demand-side data	Electricity demand of EV	country specific charging profile	Yes	No	Yes	No	Yes	No	
370	Population, total	The World Bank	Electricity demand-side data	Conventional electricity demand	Demographic development	Yes	Yes	Yes	Yes	Yes	Yes	1921 - 2020
371	Projected Costs of Generating Electricity 2020	IEA	Electricity supply-side data	Thermal generation; CONE/CORP	Fixed operating cost for existing fossil units	Yes	Yes	Yes	Yes	Yes	No	
372	Projected Costs of Generating Electricity 2020	IEA	Electricity supply-side data	Thermal generation; CONE/CORP	Fixed operating cost for new fossil units	Yes	Yes	Yes	Yes	Yes	No	
373	Projected Costs of Generating Electricity 2020	IEA	Electricity supply-side data	Thermal generation; CONE/CORP	Variable operating cost for existing fossil units	Yes	Yes	Yes	Yes	Yes	No	

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	A	B	M	N	O	P	Q	R
1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
364	PEMMDB	ENTSO-E	Power transfer distribution factor (PTDF)	hourly; index based	by country	Available in 3 different domains including alternating assumptions such as voltage level of grid	Indicates the incremental change in real power that occurs on transmission lines due to real power transfers between two regions.	Link
365	PEMMDB	ENTSO-E	Remaining available margin (MW)	hourly; index based	by country	Correlates with PDTF-Table; Available in 3 different domains including alternating assumptions such as voltage level of grid	Determines the feasible transmission region at any given point in time	Link
366	PEMMDB	ENTSO-E	Hybrid Heat Pump COP	constant variable	by country			Link
367	PEMMDB	ENTSO-E	Heat Pump COP	constant variable	by country			Link
368	PEMMDB	ENTSO-E	Air Conditioning COP	constant variable	by country			Link
369	PEMMDB	ENTSO-E	country specific charging profile	weekday, weekend	by country			Link
370	Population, total	The World Bank	Demographic development	yearly	by country		Development of demographics	Link
371	Projected Costs of Generating Electricity 2020	IEA	Fixed operating cost for existing fossil units	publication in a 5 year interval	by country	Report includes various countries, regions, assumptions and sensitivities; not all variables are available for all countries		Link
372	Projected Costs of Generating Electricity 2020	IEA	Fixed operating cost for new fossil units	publication in a 5 year interval	by country	Report includes various countries, regions, assumptions and sensitivities; not all variables are available for all countries		Link
373	Projected Costs of Generating Electricity 2020	IEA	Variable operating cost for existing fossil units	publication in a 5 year interval	by country	Report includes various countries, regions, assumptions and sensitivities; not all variables are available for all countries		Link

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1	Database		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
374	Projected Costs of Generating Electricity 2020	IEA	Electricity supply-side data	Thermal generation; CONE/CORP	Variable operating cost for new fossil units	Yes	Yes	Yes	Yes	Yes	No	
375	Projected Costs of Generating Electricity 2020	IEA	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX hard coal	Yes	Yes	Yes	Yes	Yes	No	
376	Projected Costs of Generating Electricity 2020	IEA	Electricity supply-side data	Thermal generation; CONE/CORP	CAPEX new CCGT and OCGT	Yes	Yes	Yes	Yes	Yes	No	
377	Projected Costs of Generating Electricity 2020	IEA	Electricity supply-side data	Battery storage units; CONE/CORP	CAPEX storage	Yes	Yes	Yes	Yes	Yes	No	
378	Regelleistung.net - Datencenter	50Hertz, Amprion, TenneT, TransnetBW	Network and infrastructural data	Balancing requirements	FCR requirements	No	No	Yes	No	No	Yes	historical - today
379	Regelleistung.net - Datencenter	50Hertz, Amprion, TenneT, TransnetBW	Network and infrastructural data	Balancing requirements	aFRR requirements	No	No	Yes	No	No	Yes	historical - today

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2	Author							
374	Projected Costs of Generating Electricity 2020 IEA		Variable operating cost for new fossil units	publication in a 5 year interval	by country	Report includes various countries, regions, assumptions and sensitivities; not all variables are available for all countries		Link
375	Projected Costs of Generating Electricity 2020 IEA		CAPEX hard coal	publication in a 5 year interval	by country	Report includes various countries, regions, assumptions and sensitivities; not all variables are available for all countries		Link
376	Projected Costs of Generating Electricity 2020 IEA		CAPEX new CCGT and OCGT	publication in a 5 year interval	by country	Report includes various countries, regions, assumptions and sensitivities; not all variables are available for all countries		Link
377	Projected Costs of Generating Electricity 2020 IEA		CAPEX storage	publication in a 5 year interval	by country	Report includes various countries, regions, assumptions and sensitivities; not all variables are available for all countries		Link
378	Regelleistung.net - Datencenter	50Hertz, Amprion, TenneT, TransnetBW	FCR requirements	30 minutes; daily; yearly	regional resolution based on TSO control area	Frequently updated interactive data register; in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	Frequency Containment Reserves	Link
379	Regelleistung.net - Datencenter	50Hertz, Amprion, TenneT, TransnetBW	aFRR requirements	30 minutes; daily; yearly	regional resolution based on TSO control area	Frequently updated interactive data register; in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	automatic Frequency Restoration Reserve	Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
380	Regelleistung.net - Datencenter	50Hertz, Amprion, TenneT, TransnetBW	Network and infrastructural data	Balancing requirements	mFRR requirements	No	No	Yes	No	No	Yes	historical - today
381	Regelleistung.net - Datencenter	50Hertz, Amprion, TenneT, TransnetBW	Network and infrastructural data	Balancing requirements	RR requirements	No	No	Yes	No	No	Yes	historical - today
382	Revision of World Population Prospects	United Nations	Electricity demand- side data	Conventional electricity demand	Demographic development	Yes	Yes	Yes	Yes	Yes	Yes	1950 - 2100
383	STATISTICAL FACTSHEET	ENTSO-E	Electricity supply-side data	Thermal generation	Minimum load	Yes	Yes	Yes	Yes	Yes	Yes	2009 - 2018
384	STATISTICAL FACTSHEET	ENTSO-E	Network and infrastructural data	Cross-border trade modelling (between modelled zones)	Flow-based market coupling / Net transmission capacity	Yes	Yes	Yes	Yes	Yes	Yes	2009 - 2018
385	Study on the estimation of the value of lost load of electricity supply in Europe	ACER	Electricity demand- side data	VoLL	Value of lost load (VoLL)	Yes	Yes	Yes	Yes	Yes	Yes	2015

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1				Temporal	Spatial			
2	Database	Author	Data input	resolution	resolution	Remarks	Additional Description	Link
380	Regelleistung.net - Datencenter	50Hertz, Amprion, TenneT, TransnetBW	mFRR requirements	30 minutes; daily; yearly	regional resolution based on TSO control area	Frequently updated interactive data register; in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	manual Frequency Restoration Reserve	Link
381	Regelleistung.net - Datencenter	50Hertz, Amprion, TenneT, TransnetBW	RR requirements	30 minutes; daily; yearly	regional resolution based on TSO control area	Frequently updated interactive data register; in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	Replacement Reserve	Link
382	Revision of World Population Prospects	United Nations	Demographic development	yearly	by country	Vast dataset for worldwide country-wise demographic development; includes scenarios based on various assumptions such as fertility rate and migration data		Link
383	STATISTICAL FACTSHEET	ENTSO-E	Minimum load	yearly published report (most recent version from 2019)	by country		lowest hourly load values	Link
384	STATISTICAL FACTSHEET	ENTSO-E	Flow-based market coupling / Net transmission capacity	yearly published report (most recent version from 2019)	by country			Link
385	Study on the estimation of the value of lost load of electricity supply in Europe	ACER	Value of lost load (VoLL)	historical variable	by country	Available for domestic and non domestic sectors		Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
386	Study on the estimation of the value of lost load of electricity supply in Europe	ACER	Electricity demand-side data	VoLL	Value of lost adequacy (VoLA)	Yes	Yes	Yes	Yes	Yes	Yes	2015
387	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation; CONE/CORP	Electricity efficiency, net (%)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
388	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation; CONE/CORP	Availability (%)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
389	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	CONE/CORP	Technical lifetime (years)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
390	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	CONE/CORP	Construction time (year)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
391	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation; CONE/CORP	Emission of SO ₂ , NO _x , CH ₄ , N ₂ O and Particles	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
392	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation; CONE/CORP	Nominal investment	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
393	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation; CONE/CORP	Fixed O&M	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
386	Study on the estimation of the value of lost load of electricity supply in Europe	ACER	Value of lost adequacy (VoLA)	historical variable	by country	Available for domestic and non domestic sectors		Link
387	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity efficiency, net (%)	target years	by country	Available for: Coal, Gas, Biomass, Diesel		Link
388	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Availability (%)	target years	by country	Available for: Coal, Wind, PV		Link
389	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Technical lifetime (years)	target years	by country	Available for: Coal, Gas, Biomass, Diesel, Wind, Solar PV, Solar thermal, Wave Energy, Heat pumps, Electric boilers, Geothermal		Link
390	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Construction time (year)	target years	by country	Available for: Coal, Gas, Biomass, Diesel, Wind, Solar PV, Solar thermal, Wave Energy, Heat pumps, Electric boilers, Geothermal		Link
391	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Emission of SO ₂ , NO _x , CH ₄ , N ₂ O and Particles	target years	by country	Available for: Coal, Gas, Biomass, Diesel		Link
392	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Nominal investment	target years	by country	Available for: Coal, Gas, CCS, Biomass, Diesel, Wind, Solar PV, Solar thermal, Wave Energy, Heat pumps, Electric boilers, Geothermal		Link
393	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Fixed O&M	target years	by country	Available for: Coal, Gas, CCS, Biomass, Diesel, Wind, Solar PV, Solar thermal, Wave Energy, Heat pumps, Electric boilers, Geothermal		Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
394	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation; CONE/CORP	Variable O&M	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
395	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Network and infrastructural data	Balancing requirements	Minimum load (%)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
396	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Network and infrastructural data	Balancing requirements	Primary load support (% per 30 seconds)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
397	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Network and infrastructural data	Balancing requirements	Secondary load support (% per minute)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
398	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	CONE/CORP	Life time extension of coal power plant, nominal investment	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
399	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation	Warm start-up time	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
400	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation	Cold start-up time	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
401	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Unplanned outages	Forced Outage Rate (%)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
394	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Variable O&M	target years	by country	Available for: Coal, Gas, CCS, Biomass, Diesel, Wind, Solar PV, Solar thermal, Wave Energy, Heat pumps, Electric boilers, Geothermal		Link
395	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Minimum load (%)	target years	by country	Available for: Coal, Gas, Biomass, Diesel, Heat pumps, Electric boilers, Geothermal		Link
396	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Primary load support (% per 30 seconds)	target years	by country	Available for: Coal, Gas, Biomass, Diesel, Heat pumps, Electric boilers		Link
397	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Secondary load support (% per minute)	target years	by country	Available for: Coal, Gas, Biomass, Diesel, Heat pumps, Electric boilers		Link
398	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Life time extension of coal power plant, nominal investment	target years	by country	Available for: Coal		Link
399	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Warm start-up time	target years	by country	Available for: Coal, Gas, Biomass, Diesel, Heat pumps, Electric boilers		Link
400	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Cold start-up time	target years	by country	Available for: Coal, Gas, Biomass, Diesel, Heat pumps, Electric boilers		Link
401	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Forced Outage Rate (%)	target years	by country	Available for: Coal, Gas, Biomass, Diesel, Wind, Solar PV, Solar thermal, Wave Energy, Heat pumps, Electric boilers, Geothermal	Forced outage is defined as the number of weighted forced outage hours divided by the sum of forced outage hours and operation hours. The weighted forced outage hours are the sum of hours of reduced production caused by unplanned outages, weighted according to how much capacity was out	Link

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1	Database		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
402	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation	Planned Outage (d/a)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
403	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	CONE/CORP	Space requirement (1000m2/MW)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
404	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation	CO2 Storage costs (€/t Co2 stored)	Yes	Yes	Yes	Yes	Yes	Yes	Values collected from studies published between 2010 - 2014
405	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation	CO2 Storage costs (specific investment costs)	Yes	Yes	Yes	Yes	Yes	Yes	Values collected from studies published between 2010 - 2014
406	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation	CO2 Storage costs (fixed O&M)	Yes	Yes	Yes	Yes	Yes	Yes	Values collected from studies published between 2010 - 2014
407	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation	CO2 Storage costs (variable O&M)	Yes	Yes	Yes	Yes	Yes	Yes	Values collected from studies published between 2010 - 2014

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1				Temporal	Spatial			
2	Database	Author	Data input	resolution	resolution	Remarks	Additional Description	Link
						Available for: Coal, Gas, Biomass, Diesel, Wind, Solar PV, Solar thermal, Wave Energy, Heat pumps, Electric boilers, Geothermal		
402	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Planned Outage (d/a)	target years	by country		Planned outage for example due to renovations	Link
403	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Space requirement (1000m2/MW)	target years	by country		Available for: Coal, Gas, Biomass, Diesel, Wind, Solar PV, Solar thermal, Wave Energy, Heat pumps, Electric boilers, Geothermal	Link
404	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	CO2 Storage costs (€/t Co2 stored)		by country		3 different scenarios for 3 onshore solutions and 3 offshore solutions	Link
405	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	CO2 Storage costs (specific investment costs)		by country		3 different scenarios for 3 onshore solutions and 3 offshore solutions	Link
406	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	CO2 Storage costs (fixed O&M)		by country		3 different scenarios for 3 onshore solutions and 3 offshore solutions	Link
407	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	CO2 Storage costs (variable O&M)		by country		3 different scenarios for 3 onshore solutions and 3 offshore solutions	Link

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1	Database		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
408	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation	Auxiliary electricity consumption (% of thermal input)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
409	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation	Incineration capacity of Biomass plants (Fuel input) (tonnes/h)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
410	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	Thermal generation	Additional heat potential of Biomass plants with heat pumps (% of thermal input)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
408	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Auxiliary electricity consumption (% of thermal input)	target years	by country	Available for: Biomass, Heat pumps, Electrical boilers, Geothermal	For heat-only technologies the consumption of electricity for auxiliary equipment such as pumps, ventilation systems, etc. is stated separately in percentage of heat generation capacity (i.e. MW auxiliary/MW heat). For heat pumps, internal consumption is considered part of the efficiency (coefficient of performance, COP), while other electricity demand for external pumping, e.g. ground water pumping, is stated under auxiliary electricity consumption. For CHP generation, auxiliary consumption is not stated separately but included in the net efficiency and for non-thermal plants, as a reduction in the number of full load hours.	Link
409	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Incineration capacity of Biomass plants (Fuel input) (tonnes/h)	target years	by country	Available for Biomass plants of different sizes		Link
410	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Additional heat potential of Biomass plants with heat pumps (% of thermal input)	target years	by country	Available for Biomass plants of different sizes	Additional heat potential for heat pump is the flue gas condensation potential remaining after the direct condensation stage (condensation by heat exchange with DH-water). Direct condensation is included in all cases, and combustion air humidification is included in lower/upper ranges of 2020 and 2050	Link

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1	Database Author		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
411	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	RES generation	Hub height wind power plants	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
412	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	RES generation	Rotor diameter wind power plants	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
413	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	CONE/CORP	Grid connection costs	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
414	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	CONE/CORP	Costs related to rent of land	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
415	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	CONE/CORP	Costs related to decommissioning of existing wind turbines	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
416	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	RES generation; CONE/CORP	Average capacity factor	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
417	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	RES generation; CONE/CORP	Average availability (%)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
418	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	CONE/CORP	Specific area coverage (MW/km2)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
419	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	RES generation; CONE/CORP	Performance ratio (measure of combined losses)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
420	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	RES generation; CONE/CORP	Average PV module conversion efficiency (%)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
421	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	RES generation; CONE/CORP	Inverter lifetime (years)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
422	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	RES generation; CONE/CORP	Full-load hours (kWh/kw)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
411	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Hub height wind power plants	target years	by country	Available for different Wind power plant sizes offshore and onshore		Link
412	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Rotor diameter wind power plants	target years	by country	Available for different Wind power plant sizes offshore and onshore		Link
413	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Grid connection costs	target years	by country	Available for Wind power, Solar PV and Heat pumps of different sizes		Link
414	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Costs related to rent of land	target years	by country	Available for Wind power and Solar PV of different sizes		Link
415	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Costs related to decommissioning of existing wind turbines	target years	by country	Available for Wind power		Link
416	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Average capacity factor	target years	by country	Available for Wind power plants of different sizes		Link
417	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Average availability (%)	target years	by country	Available for Wind power plants and solar power plants of different sizes		Link
418	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Specific area coverage (MW/km2)	target years	by country	Available for Wind power plants of different sizes		Link
419	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Performance ratio (measure of combined losses)	target years	by country	Available for solar power plants of different sizes		Link
420	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Average PV module conversion efficiency (%)	target years	by country	Available for solar power plants of different sizes		Link
421	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Inverter lifetime (years)	target years	by country	Available for solar power plants of different sizes		Link
422	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Full-load hours (kWh/kw)	target years	by country	Available for solar power plants of different sizes		Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
423	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	RES generation; CONE/CORP	Peak power full-load hours (kWh/kWp)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
424	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	CONE/CORP	PV module cost	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
425	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	CONE/CORP	Balance of Plant cost	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
426	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	RES generation; CONE/CORP	Average annual degradation of full-load hours (%)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
427	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	RES generation; CONE/CORP	Total efficiency of heat pumps of different sizes, net (%), annual average	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
428	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	RES generation; CONE/CORP	Heat generation from geothermal heat (MJ/s)	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
429	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electricity supply-side data	CONE/CORP	Electric efficiency of different CCS technologies	Yes	Yes	Yes	Yes	Yes	Yes	2015; 2020; 2030; 2050
430	TenneT TSO BV (NL) biennial report on Balancing	TenneT	Network and infrastructural data	Balancing requirements	aFRR requirements	No	No	No	No	Yes	No	2017; 2018; 2019
431	TenneT TSO BV (NL) biennial report on Balancing	TenneT	Network and infrastructural data	Balancing requirements	mFRR requirements	No	No	No	No	Yes	No	2017; 2018; 2019

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
423	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Peak power full-load hours (kWh/kWp)	target years	by country	Available for solar power plants of different sizes		Link
424	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	PV module cost	target years	by country	Available for solar power plants of different sizes		Link
425	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Balance of Plant cost	target years	by country	Available for solar power plants of different sizes		Link
426	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Average annual degradation of full load hours (%)	target years	by country	Available for solar power plants of large sizes		Link
427	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Total efficiency of heat pumps of different sizes, net (%), annual average	target years	by country	Available for solar power plants of large sizes		Link
428	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Heat generation from geothermal heat (MJ/s)	target years	by country	Available for solar power plants of large sizes		Link
429	Technology Data - Generation of Electricity and District heating	Danish Energy Agency and Energinet	Electric efficiency of different CCS technologies	target years	by country	Available for solar power plants of large sizes		Link
430	TenneT TSO BV (NL) biennial report on Balancing	TenneT	aFRR requirements	report published every 2 years	by country	in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	automatic Frequency Restoration Reserve	Link
431	TenneT TSO BV (NL) biennial report on Balancing	TenneT	mFRR requirements	report published every 2 years	by country	in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	manual Frequency Restoration Reserve	Link

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1	Database		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
432	TenneT TSO BV (NL) biennial report on Balancing	TenneT	Network and infrastructural data	Balancing requirements	Total FRR requirements	No	No	No	No	Yes	No	2017; 2018; 2019
433	TenneT TSO BV (NL) biennial report on Balancing	TenneT	Network and infrastructural data	Balancing requirements	Total Imbalance	No	No	No	No	Yes	No	2017; 2018; 2019
434	TenneT TSO BV (NL) biennial report on Balancing	TenneT	Network and infrastructural data	Balancing requirements	Total Balancing energy	No	No	No	No	Yes	No	2017; 2018; 2019
435	TenneT TSO BV (NL) biennial report on Balancing	TenneT	Network and infrastructural data	Balancing requirements	[-/+, +/-] Largest Incidents	No	No	No	No	Yes	No	2017; 2018; 2019
436	Transparency Platform	ENTSO-E	Network and infrastructural data	Cross-border trade modelling (between modelled zones)	Cross-border physical flows	Yes	Yes	Yes	Yes	Yes	Yes	2015 - ongoing
437	Transparency Platform	ENTSO-E	Electricity supply-side data	Thermal generation	Planned Unavailability of Generation Units	Yes	Yes	Yes	Yes	Yes	Yes	2014 - forecast

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
432	TenneT TSO BV (NL) biennial report on Balancing	TenneT	Total FRR requirements	report published every 2 years	by country	in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing		Link
433	TenneT TSO BV (NL) biennial report on Balancing	TenneT	Total Imbalance	report published every 2 years	by country	in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	(all ISP) Negative (BRP short) + Positive (BRP long)	Link
434	TenneT TSO BV (NL) biennial report on Balancing	TenneT	Total Balancing energy	report published every 2 years	by country	in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	Balance sheet of total imbalance settlement period (ISP)	Link
435	TenneT TSO BV (NL) biennial report on Balancing	TenneT	[-/-, +/-] Largest Incidents	report published every 2 years	by country	in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing	[-/-, +/-] Deterministic criteria FRR dimensioning	Link
436	Transparency Platform	ENTSO-E	Cross-border physical flows	hourly	by country; by bidding zone			Link
437	Transparency Platform	ENTSO-E	Planned Unavailability of Generation Units	quarter hourly	by country; by bidding zone	The planned and forced unavailabilities of production and generation units expected to last for at least one market time unit up to three years ahead.	Planned outage	Link

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1	Database Author		Category RAA element		Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
438	Transparency Platform	ENTSO-E	Electricity supply-side data	Unplanned outages	Changes in Actual Availability of Generation Units	Yes	Yes	Yes	Yes	Yes	Yes	2014 - forecast
439	Transparency Platform	ENTSO-E	Electricity supply-side data	Thermal generation	Planned Unavailability of Production Units	Yes	Yes	Yes	Yes	Yes	Yes	2014 - forecast
440	Transparency Platform	ENTSO-E	Electricity supply-side data	Unplanned outages	Changes in Actual Availability of Production Units	Yes	Yes	Yes	Yes	Yes	Yes	2014 - forecast
441	Transparency Platform	ENTSO-E	Electricity supply-side data	Thermal generation	Planned Unavailability in the Transmission Grid	Yes	Yes	Yes	Yes	Yes	Yes	2014 - forecast
442	Transparency Platform	ENTSO-E	Electricity supply-side data	Unplanned outages	Changes in Actual Availability in the Transmission Grid	Yes	Yes	Yes	Yes	Yes	Yes	2014 - forecast

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1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
438	Transparency Platform	ENTSO-E	Changes in Actual Availability of Generation Units	quarter hourly	by country; by bidding zone	The planned and forced unavailabilities of production and generation units expected to last for at least one market time unit up to three years ahead.	Forced outage	Link
439	Transparency Platform	ENTSO-E	Planned Unavailability of Production Units	quarter hourly	by country; by bidding zone	The planned and forced unavailabilities of production and generation units expected to last for at least one market time unit up to three years ahead.	Planned outage	Link
440	Transparency Platform	ENTSO-E	Changes in Actual Availability of Production Units	quarter hourly	by country; by bidding zone	The planned and forced unavailabilities of production and generation units expected to last for at least one market time unit up to three years ahead.	Forced outage	Link
441	Transparency Platform	ENTSO-E	Planned Unavailability in the Transmission Grid	quarter hourly	by country; by bidding zone	The planned and forced unavailabilities, including changes in unavailability of interconnections in the transmission grid that reduce transfer capacities between areas during at least one market time unit including information about new Net Transfer Capacity.	Planned outage	Link
442	Transparency Platform	ENTSO-E	Changes in Actual Availability in the Transmission Grid	quarter hourly	by country; by bidding zone	The planned and forced unavailabilities, including changes in unavailability of interconnections in the transmission grid that reduce transfer capacities between areas during at least one market time unit including information about new Net Transfer Capacity.	Forced outage	Link

Resource Adequacy in the Pentilateral Energy Forum
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	A	B	C	D	E	F	G	H	I	J	K	L
1	Database		Category	RAA element	Data input	Countries						Years
2						AT	BE	DE	FR	NL	LU	
443	Transparency Platform	ENTSO-E	Electricity supply-side data	Thermal generation	Planned Unavailability of Consumption Units	Yes	Yes	Yes	Yes	Yes	Yes	2014 - forecast
444	Transparency Platform	ENTSO-E	Electricity supply-side data	Unplanned outages	Changes in Actual Availability of Consumption Units	Yes	Yes	Yes	Yes	Yes	Yes	2014 - forecast
445	TYNDP 2020	ENTSO-E	Network and infrastructural data	Cross-border trade modelling (between modelled zones)	New interconnection projects	Yes	Yes	Yes	Yes	Yes	Yes	2020

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	A	B	M	N	O	P	Q	R
1	Database		Data input	Temporal resolution	Spatial resolution	Remarks	Additional Description	Link
2								
443	Transparency Platform	ENTSO-E	Planned Unavailability of Consumption Units	quarter hourly	by country; by bidding zone	View on unavailability of consumption units in aggregated form. All planned and forced outages in selected area are aggregated according the market time unit. List of specific consumption units is not provided	Planned outage	Link
444	Transparency Platform	ENTSO-E	Changes in Actual Availability of Consumption Units	quarter hourly	by country; by bidding zone	View on unavailability of consumption units in aggregated form. All planned and forced outages in selected area are aggregated according the market time unit. List of specific consumption units is not provided	Forced outage	Link
445	TYNDP 2020	ENTSO-E	New interconnection projects	Project based	by country			Link