International Energy Agency

Data collection on grid-scale battery storage

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Outline

Overview and key trends

Data collection

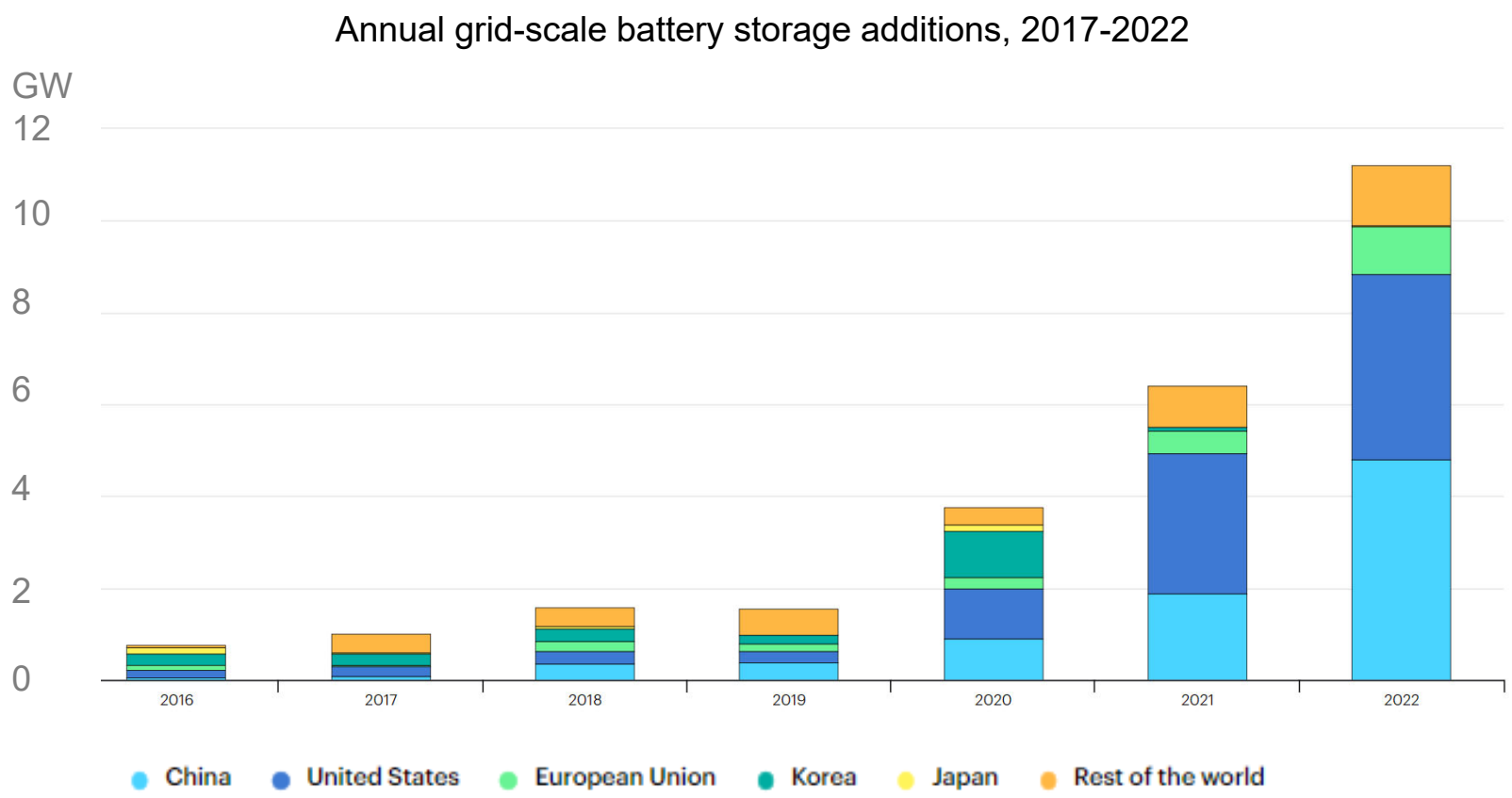
Overview and key trends

Grid-scale storage overview

- What is grid-scale storage?
  - Grid-scale storage refers to technologies **connected to the power grid** that can store energy and then supply it back to the grid at a more advantageous time
  - **Batteries** are now playing a growing role as they can be installed anywhere in a wide range of capacities in a modular way

- What is the role of energy storage in clean energy transitions?
  - Grid-scale storage will be **essential to provide key services** to the grid such as
    - ➢Stabilize the electricity grid for **sub-hourly and hourly variations**
    - ➢Manage the impact of **daily production variations**
    - ➢Smooth **seasonal variations**
  - Batteries are typically employed for sub-hourly, hourly and daily balancing

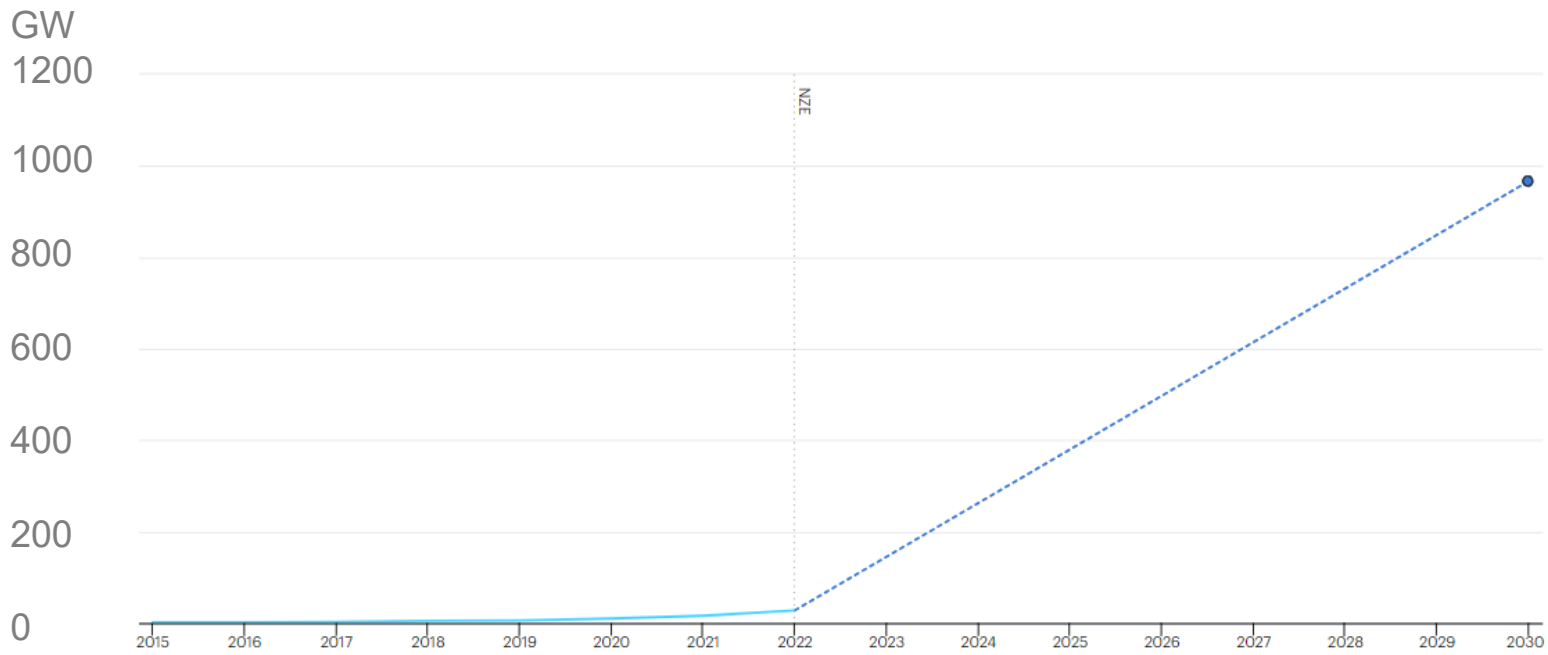
Implementation of grid-scale batteries has grown fast



Grid-scale batteries are projected to account for the majority of storage growth world wide. Lithium-ion battery storage continued to be the most widely used.

Grid-scale battery storage needs to grow significantly

Global installed grid-scale battery storage capacity in the Net Zero Scenario, 2015-2030



In the Net Zero Scenario, installed grid-scale battery storage capacity expands 35-fold between 2022 and 2030 to nearly 970 GW. To get on track, annual additions must pick up significantly, to an average of close to 120 GW per year over the 2023-2030 period.

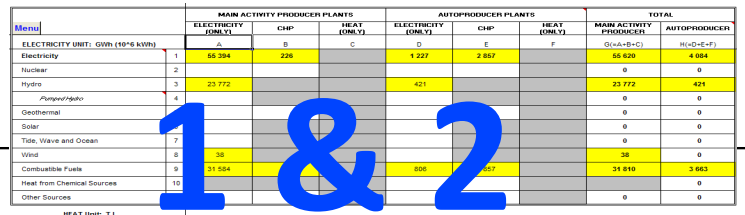
Data collection

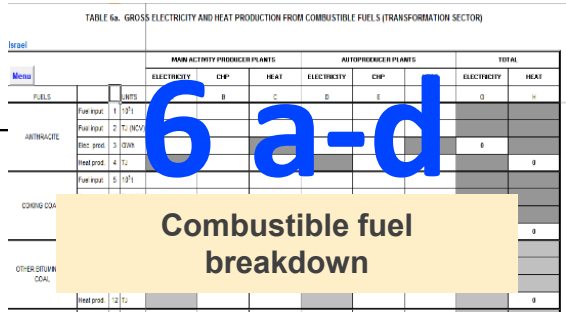
Electricity & Heat AQ

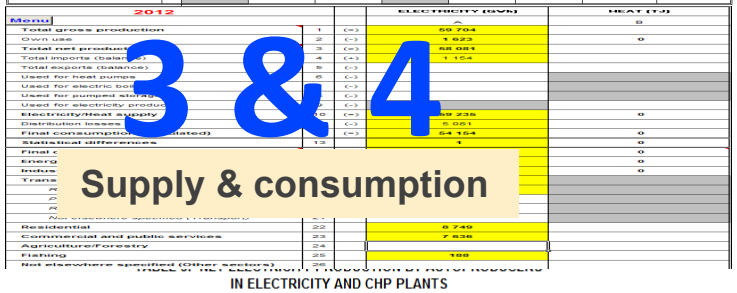
10 Tables

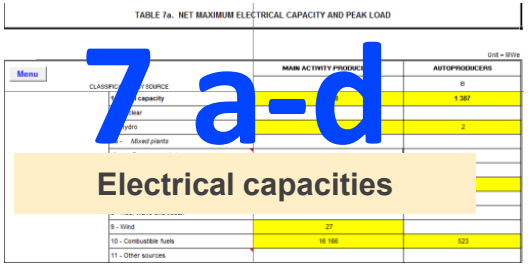
covering

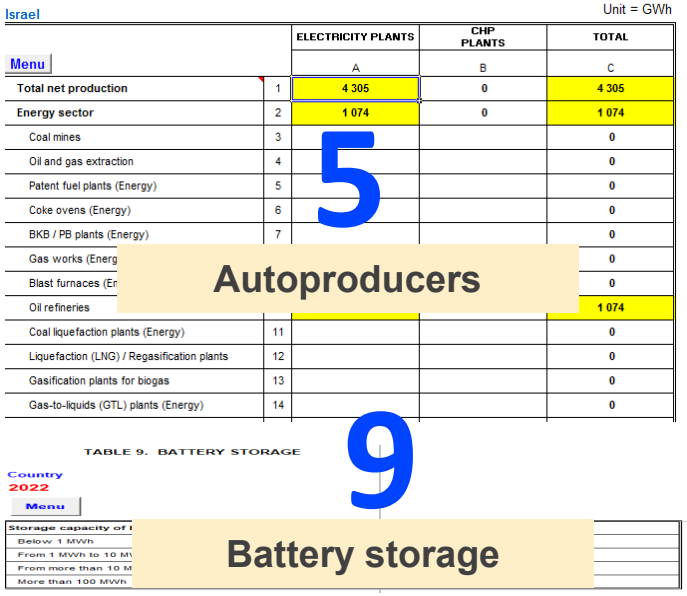
- **Electricity and heat data** generation by:
  - **47** individual fuels
  - type of producer
  - type of plant/unit
- **Consumption data** by sector
- **Technical information** on electrical systems
- Download from here https://www.iea.org/about/data-and-statistics/questionnaires











Batteries in generation and commodity balance

- In the gross electricity production by source table 1: ‘Of which: from batteries’

Country

TABLE 1. GROSS ELECTRICITY AND HEAT PRODUCTION: (TRANSFORMATION SECTOR)

Menu 2022		MAIN ACTIVITY PRODUCER				AUTOPRODUCER					TOTAL	
		ELECTRICITY	CHP	of which in full CHP mode	HEAT	ELECTRICITY	CHP	of which in full CHP mode	HEAT	of which auto-consumed heat	MAIN ACTIVITY PRODUCER	AUTOPRODUCER
ELECTRICITY UNIT: GWh (10^6 kWh)		A	B	C	D	E	F	G	H	I	J(=A+B+D)	K(=E+F+H)
Other sources	11	0.000	0.000	0.000		0.000	0.000	0.000			0.000	0.000
Of which: from (derived/district) heat	12	0.000	0.000	0.000		0.000	0.000	0.000			0.000	0.000
Of which: from batteries	13	0.000	0.000	0.000		0.000	0.000	0.000			0.000	0.000

- In the electricity balance table 3: ‘Used for charging batteries’

TABLE 3. ELECTRICITY AND HEAT SUPPLY AND CONSUMPTION

Country

Menu 2022			ELECTRICITY (GWh)	HEAT (TJ)
			A	B
Total gross production	1	(=)	**0.000**	**0.000**
Own use	2	(-)	**0.000**	**0.000**
Total net production	3	(=)	**0.000**	**0.000**
Total imports (balance)	4	(+)	0.000	0.000
Total exports (balance)	5	(-)	0.000	0.000
Used for heat pumps	6	(-)	0.000	
Used for electric boilers	7	(-)	0.000	
Used for pumped storage in pure hydro pumping plants	8	(-)	0.000	
Used for pumped storage in mixed plants	9	(-)	0.000	
Used for charging batteries	10	(-)	0.000	
Used for electricity production	11	(-)		0.000

Battery storage table

TABLE 9. BATTERY STORAGE

Country

2022

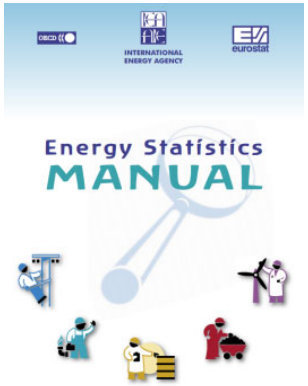
Menu

Storage capacity of batteries (MWh)	0.000
Below 1 MWh	0.000
From 1 MWh to 10 MWh	0.000
From more than 10 MWh to 100 MWh	0.000
More than 100 MWh	0.000
Rated power capacity of batteries (MW)	0.000
Below 1 MWh	0.000
From 1 MWh to 10 MWh	0.000
From more than 10 MWh to 100 MWh	0.000
More than 100 MWh	0.000
Electricity injected in the grid from batteries (GWh)	0.000
Below 1 MWh	0.000
From 1 MWh to 10 MWh	0.000
From more than 10 MWh to 100 MWh	0.000
More than 100 MWh	0.000
Electricity used from the grid to charge batteries (GWh)	0.000
Below 1 MWh	0.000
From 1 MWh to 10 MWh	0.000
From more than 10 MWh to 100 MWh	0.000
More than 100 MWh	0.000

- In this table the **storage capacity of batteries**, the **rated power capacity of batteries**, the **electricity injected in the grid from batteries** and the **electricity used from the grid to charge batteries** are reported
- The information should be declared for batteries connected to the grid and used as storing/balancing element. **Only exchanges with the grid** need to be declared.
- Each of the elements above should be split in the following size groups of storage capacity:
  - Below 1 MWh
  - From 1 MWh to 10 MWh
  - From more than 10 MWh to 100 MWh
  - More than 100 MWh.

Learn more about energy statistics

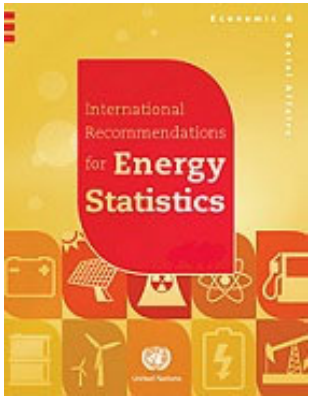
Energy Statistics Manual



- Available in 10 languages
- Data collection methodologies
- Consistent with the IRES framework

Click here

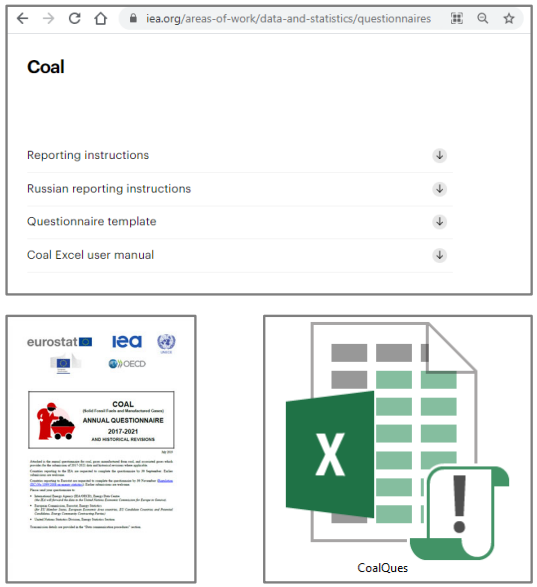
United Nations' International Recommendations for Energy Statistics (IRES)



- Available in 6 languages
- International framework for energy statistics

Click here

IEA Statistics website

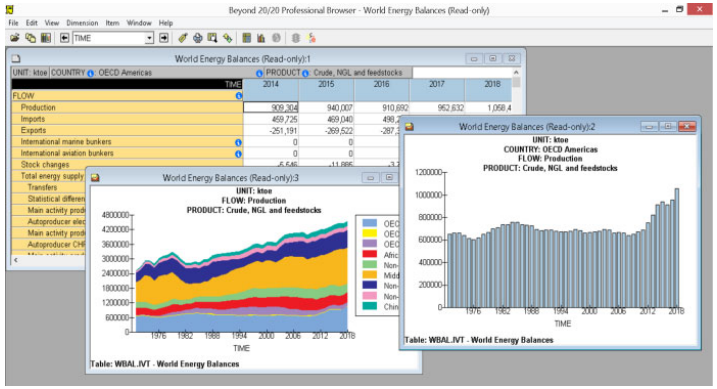


- Questionnaires
- Reporting instructions

Click here

Beyond data collection

Data services for purchase



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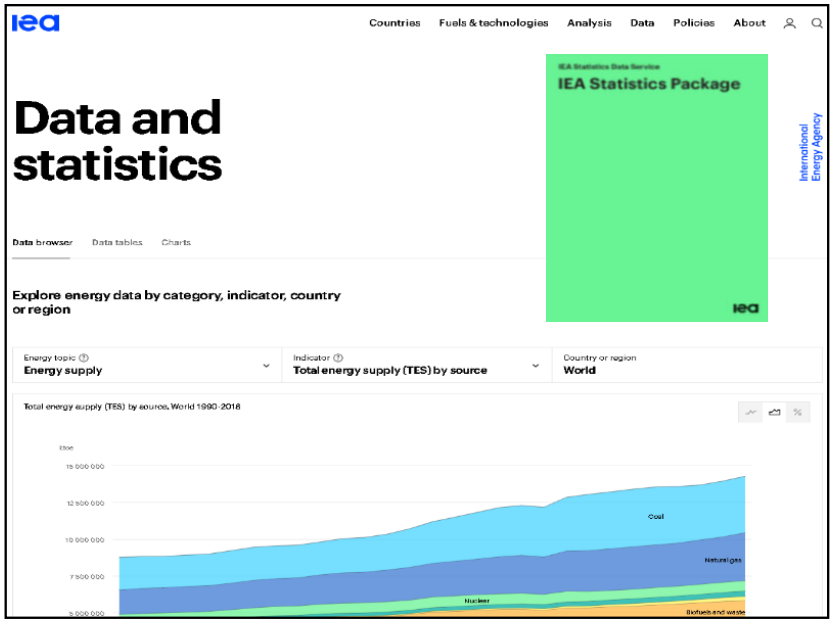

Data support for the Agency