

vgbe Technical-Scientific Report

# Analysis of Unavailability of Power Plants 2014 – 2023

VGBE-TW-103Ae (2024)



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Technical-Scientific Report  
Analysis of Unavailability of  
Power Plants 2014 – 2023

VGBE-TW-103Ae (2024)  
(formerly VGB-TW 103Ae)

Publisher:  
vgbe energy e.V.

Publishing house:  
vgbe energy service GmbH  
Verlag technisch-wissenschaftlicher Schriften  
Deilbachtal 173, 45257 Essen, Germany

Tel.: +49 201 8128-200

E-mail: [sales-media@vgbe.energy](mailto:sales-media@vgbe.energy)

ISBN 978-3-96284-377-9 (e-book, English)

ISBN 978-3-96284-376-2 (e-book, German)

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## **Reference to series**

*Verfügbarkeit von Kraftwerken 2014 – 2023*

*VGBE-TW-103V (2024) German Edition: ISBN 978-3-96284-374-8 (e-book)*

*Analysis of Availability of Power Plants 2014 – 2023*

*VGBE-TW-103Ve (2024) English Edition: ISBN 978-3-96284-375-5 (e-book)*

*Analyse der Nichtverfügbarkeit von Kraftwerken 2014 – 2023*

*VGBE-TW-103A (2024) German Edition: ISBN 978-3-96284-376-2 (e-book)*

*Analysis of Unavailability of Power Plants 2014 – 2023*

*VGBE-TW-103Ae (2024) English Edition: ISBN 978-3-96284-377-9 (e-book)*

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## I. Introductory Remarks

### Introduction

Since 1970 vgbe/VGB<sup>1</sup> has been collecting data according to standardized uniform definitions and recording procedures. With the liberalization of the energy markets, the technical and economic assessment of power plants has gained more and more importance. On the basis of the cooperation between Eurelectric and the former VGB it was decided to merge data collection regarding the availability and unavailability of power plants. These data provide information about the availability and utilization of thermal power plants in order to compare the performance of power plants and to assess plants' behaviour in daily operation. Reasons for unavailability of systems and main components also have been collected since 1988 in order to identify and assess direct cause.

However power generation in Europe has changed substantially over the last decade. The development of renewables, the generation decrease of conventional power plants, the different national European energy policies, and the electricity market development need more flexibility in operation and effective tools to help taking the right decisions.

According to the suggestions of the vgbe Technical Committee "Performance Indicators" (TCPI) the database system KISSY is modified and upgraded in order to be able to provide technical benchmark reports at the screen. The European utilities which provide data are able to analyse the data online. Currently the German, English, French, Italian, Dutch, and Portuguese languages are supported. In the future apart from the existing parameters, it will also be possible to evaluate the parameters that were newly defined by the TCPI with the new online analysis tool. Commercial background information (e.g. price data of the electricity stock exchange) are foreseen to be included in the KISSY system, too.

In addition to upgrade the KISSY database, the associated vgbe/VGB-Standards are already published in different languages. The former VGB Guidelines "Availability of Thermal Power Plants", "Unavailability of Thermal Power Plants" and "EMS Event Criterion Key Systems" had been merged into one, completely revised guideline and in the meanwhile has been updated by the newly defined parameters for several times on a regular update basis. The up-to-date English, French and German versions can be downloaded from the vgbe Homepage<sup>2</sup> for free.

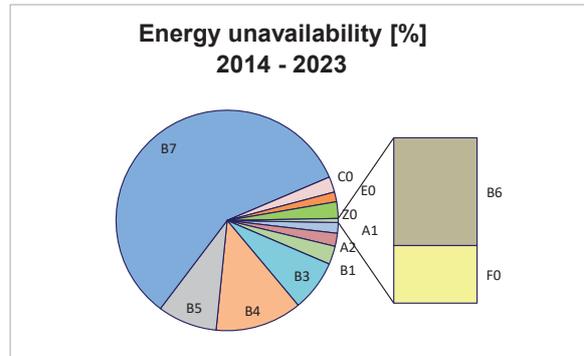
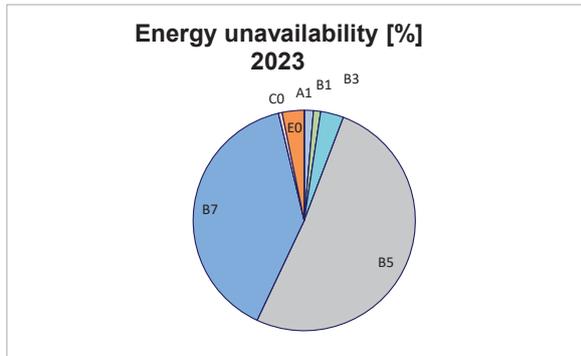
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1 vgbe energy e.V. has been the new name of VGB PowerTech since April 2022.

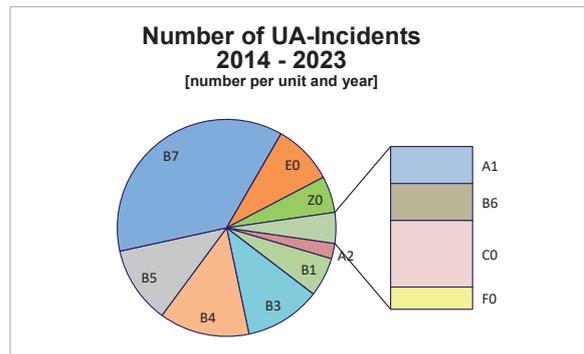
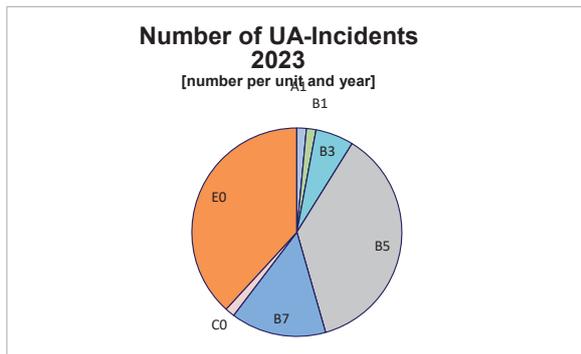
2 [www.vgbe.energy](http://www.vgbe.energy)

**A. Types of incidents of planned unavailability 2014 – 2023**

**A.2 Combined cycle units, total**  
(36 units, AT, DE, FR, LV, PT)



	EMS 1	Units	A1	A2	B1	B2	B3	B4	B5	B6	B7	B8	C0	E0	F0	Z0
Energy unavailability [%]	2023	19	0.15	0.00	0.11	0.00	0.37	0.00	5.60	0.00	4.29	0.00	0.06	0.35	0.00	0.00
	2014 - 2023	36	0.12	0.15	0.21	0.00	0.58	0.98	0.67	0.03	4.53	0.00	0.18	0.11	0.02	0.19
Unavailability incidents per unit and year	2023	19	0.05	0.00	0.05	0.00	0.21	0.00	0.00	0.00	0.53	0.00	0.05	1.37	0.00	0.00
	2014 - 2023	36	0.02	0.05	0.13	0.00	0.26	0.31	0.26	0.02	0.85	0.00	0.04	0.21	0.01	0.13

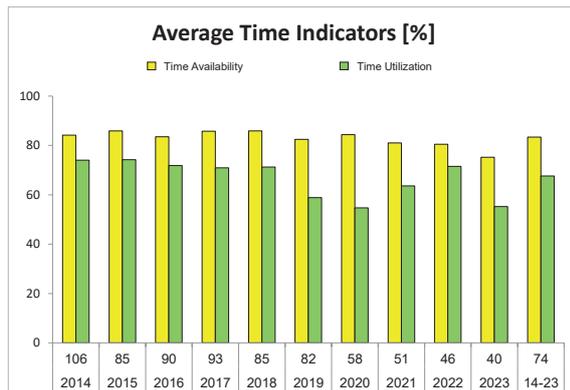
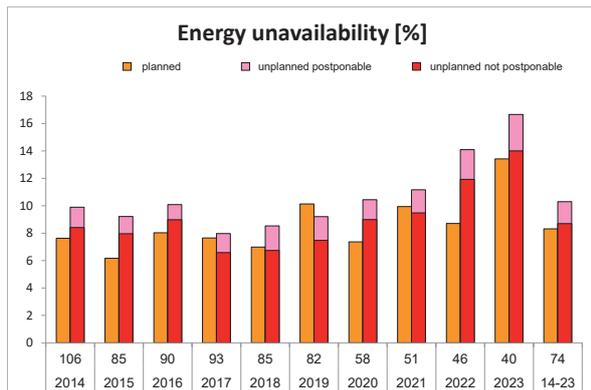
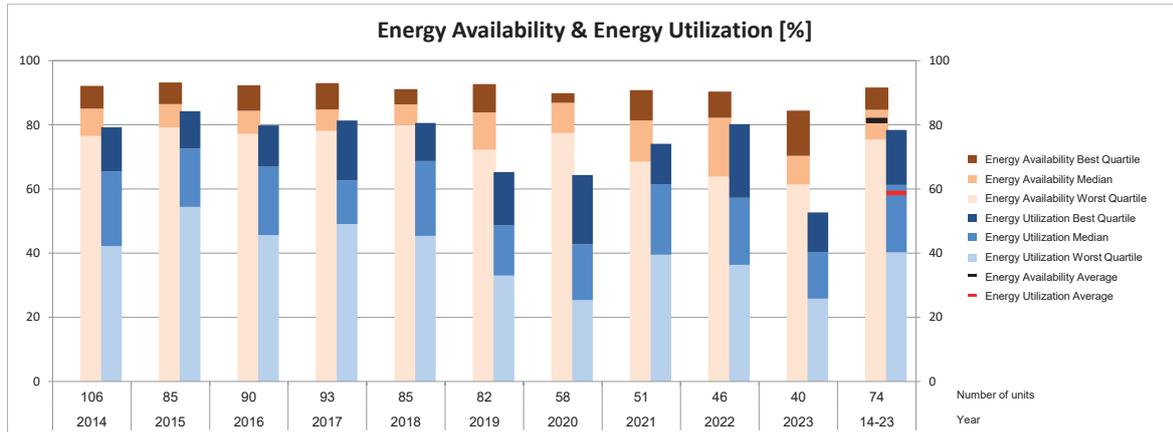


**Types of incidents of planned unavailability (EMS 1)**

- A1 Failure without damage
- A2 Damage
- B1 Check/condition check
- B2 Lubrication
- B3 Maintenance
- B4 Inspection
- B5 Preventive maintenance
- B6 Cleaning
- B7 Revision
- B8 Refuelling
- C0 Reconstruction/refurbishment
- E0 Tests/functional tests/functional check
- F0 Official test/measure
- Z0 Other type of incidents

## B. Analysis of unplanned unavailability 2014 – 2023

### B.1.1 Fossil-fired units, total (127 units, AT, DE, IT, PL, PT)

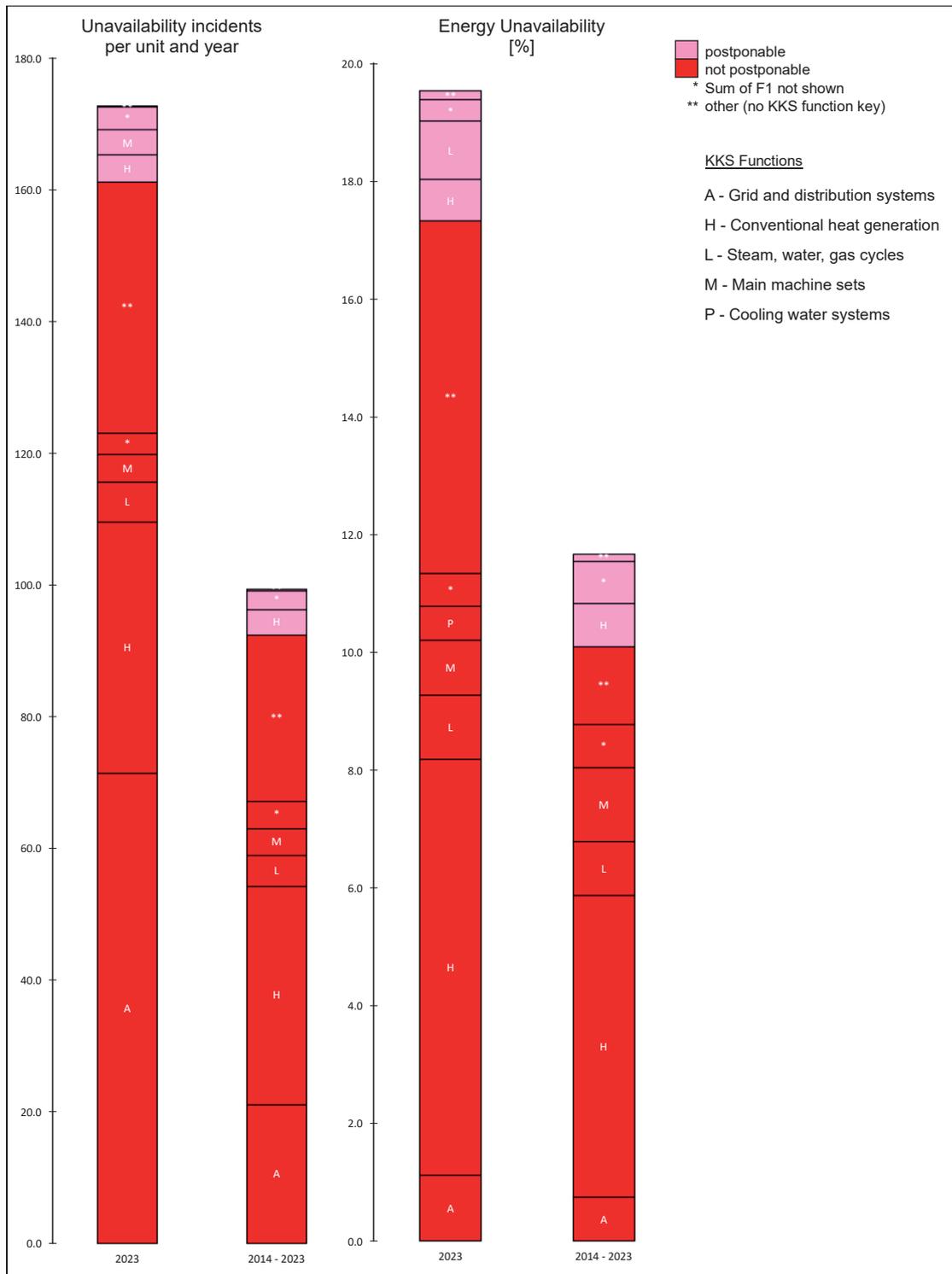


Average values/Quartile values		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	14-23
Number		106	85	90	93	85	82	58	51	46	40	74
Capacity	MW	42,296	35,014	36,190	35,590	33,089	31,137	27,049	24,588	22,534	19,542	30,703
Energy Availability	%	82.5	84.6	81.9	84.4	84.5	80.7	82.2	78.9	77.2	69.9	81.4
worst quartile	%	76.5	79.2	77.2	78.1	79.9	72.2	77.4	68.5	63.8	61.4	75.4
median	%	85.1	86.5	84.4	84.8	86.4	83.9	86.9	81.4	82.2	70.3	84.7
best quartile	%	92.1	93.2	92.4	93.0	91.1	92.7	89.8	90.8	90.4	84.4	91.6
Energy Unavailability	%	17.5	15.4	18.1	15.6	15.5	19.3	17.8	21.1	22.8	30.1	18.6
planned part	%	7.6	6.2	8.0	7.7	7.0	10.1	7.4	9.9	8.7	13.4	8.3
unplanned part	%	9.9	9.2	10.1	8.0	8.5	9.2	10.4	11.2	14.1	16.7	10.3
postponable	%	1.5	1.3	1.1	1.4	1.8	1.7	1.4	1.7	2.2	2.7	1.6
not postponable	%	8.4	8.0	9.0	6.6	6.7	7.5	9.0	9.5	11.9	14.0	8.7
Energy Utilization	%	64.1	68.0	63.2	62.7	64.6	50.2	43.1	54.8	61.0	42.8	58.7
worst quartile	%	42.2	54.4	45.7	49.1	45.4	33.0	25.3	39.5	36.3	25.8	40.2
median	%	65.5	72.6	66.9	62.7	68.7	48.7	42.8	61.5	57.3	40.3	61.2
best quartile	%	79.2	84.2	79.8	81.4	80.6	65.3	64.3	74.1	80.2	52.7	78.4
Time Availability	%	84.2	85.9	83.5	85.7	85.9	82.5	84.4	81.0	80.5	75.2	83.4
worst quartile	%	78.5	80.1	78.3	78.5	80.6	73.7	78.6	71.4	67.8	67.1	77.1
median	%	87.4	88.5	85.5	85.8	87.7	84.3	86.9	81.8	84.4	74.3	85.7
best quartile	%	93.8	94.3	93.2	94.2	93.0	93.3	91.7	92.5	91.4	88.0	93.0
Time Utilization	%	74.1	74.2	71.8	70.9	71.2	58.9	54.7	63.6	71.5	55.2	67.6
worst quartile	%	63.0	68.6	61.3	57.8	54.6	41.0	35.0	50.4	46.2	32.4	51.9
median	%	77.4	79.9	79.5	80.0	78.9	62.1	68.2	73.0	74.8	56.9	74.7
best quartile	%	89.0	91.7	88.2	91.8	88.0	78.0	79.9	87.6	88.9	78.9	87.5

## B. Analysis of unplanned unavailability 2014 – 2023

### B.1 Causers all areas (KKS function keys F1: A to Z)

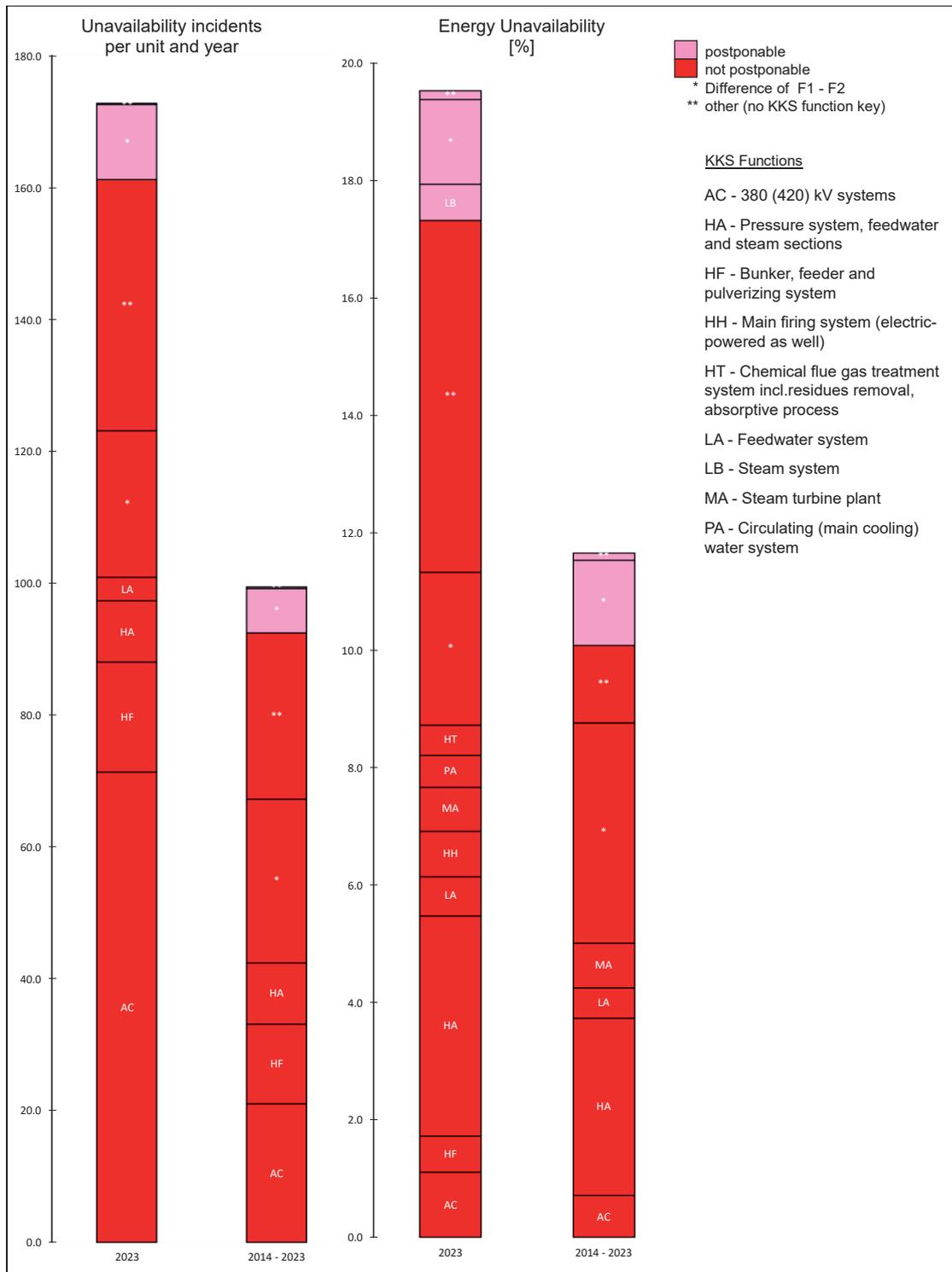
#### B.1.1 Fossil-fired units, total (127 units, AT, DE, IT, PL, PT)



## B. Analysis of unplanned unavailability 2014 – 2023

### B.1 Causers all areas (KKS function keys F1: A to Z)

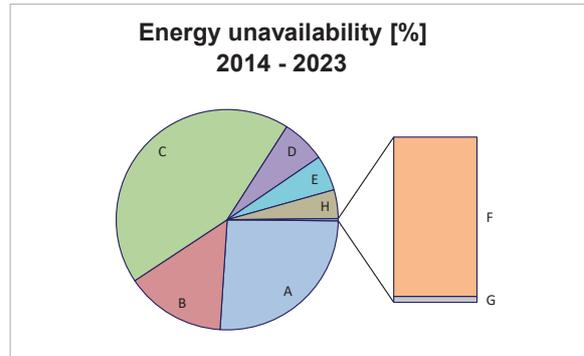
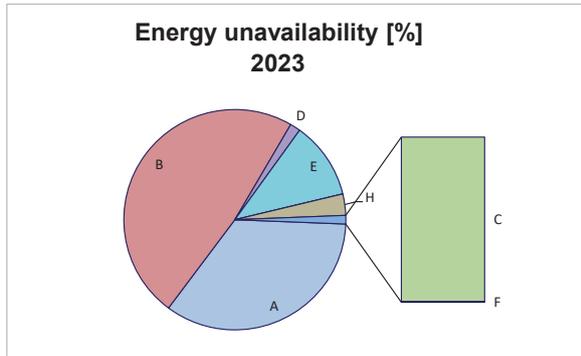
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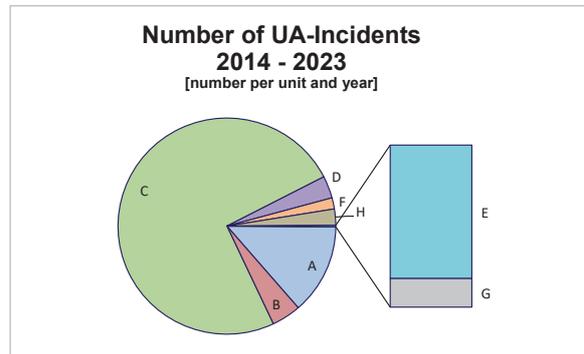
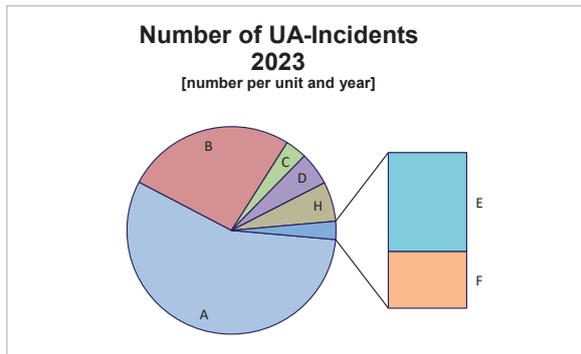
**B. Analysis of unplanned unavailability 2014 – 2023**

**B.4 Time-frame**

**B.4.2 Combined cycle units, total**  
(36 units, AT, DE, FR, LV, PT)



	EMS 4/1	Units	A	B	C	D	E	F	G	H
Energy unavailability [%]	2023	19	7.88	10.99	0.28	0.35	2.58	0.00	0.00	0.71
	2014 - 2023	36	2.73	1.55	4.58	0.68	0.55	0.03	0.00	0.45
Unavailability incidents per unit and year	2023	19	11.53	5.37	0.68	1.05	0.37	0.21	0.00	1.26
	2014 - 2023	36	4.77	1.54	26.27	1.17	0.07	0.59	0.01	0.86



**time-frame of unavailability (EMS 4/1)**

- A Automatic load-rejection/fast shutdown
- B Manual load-rejection/fast shutdown
- C Controlled shutdown within 12 hours
- D Start-up or recommissioning not possible
- E Exceeding planned incident-time
- F Start-up-time extension
- G Start-up prolongation
- H Postponable more than 12 hours