IGCC Regular Report on Social Welfare

Q1 2021

IGCC-Settlement – Basic Principle
(Methodology applied from 01/02/2016)

Opportunity Prices for Imbalance Netting	**without IGCC** → **with IGCC** → **Opportunity Price = Opportunity Value/IGCC Volume** without IGCC: $SCE_{\text{before IGCC}}$ [MWh] x $SCE\ price_{\text{before IGCC}}$ [€/MWh] with IGCC: IGCC exchange; $SCE_{\text{after IGCC}}$ [MWh] x $SCE\ price_{\text{after IGCC}}$ [€/MWh] Opportunity Price = [($SCE_{\text{before IGCC}}$ * $SCE\ price_{\text{before IGCC}}$) - ($SCE_{\text{after IGCC}}$ * $SCE\ price_{\text{after IGCC}}$)] / IGCC exchange
IGCC Initial Settlement Price	— IGCC Initial Settlement Price (P_{IGCC}): **Energy weighted** ($E_{\text{Imp},i}$ and $E_{\text{Exp},i}$) **average** of the **opportunity prices** ($C_{\text{Imp},i}$ and $C_{\text{Exp},i}$) — Symmetric price for IGCC imports and exports $$P_{\text{IGCC}} = \sum_{i=1}^{n}\left(C_{\text{Imp},i}E_{\text{Imp},i} + C_{\text{Exp},i}E_{\text{Exp},i}\right) \bigg/ \sum_{i=1}^{n}\left(E_{\text{Imp},i} + E_{\text{Exp},i}\right)$$
IGCC Settlement Ex-post Adjustment	— In case of negative individual benefits for one or more IGCC Members but positive overall benefit of the IGCC, an ex-post adjustment of settlement is performed in order to guarantee TSO neutrality. — IGCC adjusted settlement prices (P'_{IGCC}) which may vary from member to member depending on their benefit before the adjustment
Calculation of Cost Reduction	— Cost reduction for a participant is driven by the spread between the opportunity price and the IGCC adjusted settlement price $$B'_i = \sum_{t=1}^{T}\left(C_{\text{Imp},i,t} - P'_{\text{IGCC},i,t}\right)\cdot E_{\text{Imp},i,t} + \sum_{t=1}^{T}\left(P'_{\text{IGCC},i,t} - C_{\text{Exp},i,t}\right)\cdot E_{\text{Exp},i,t}$$

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Monthly Volumes of Netted Imbalances

Amount of Netted Imbalances (Short+Long) - Monthly Values (GWh)

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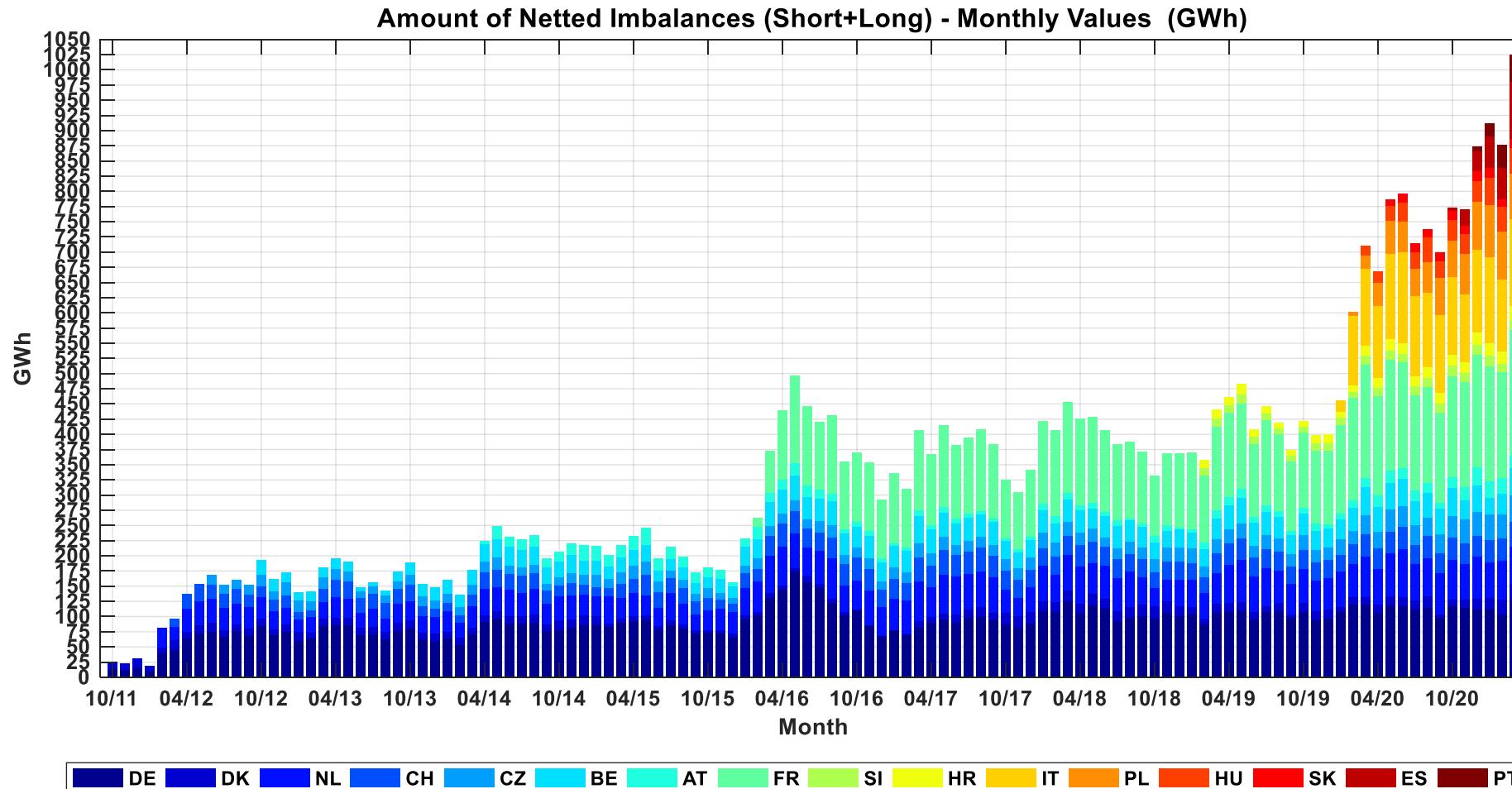
Monthly Volumes of Netted Imbalances
(last Year, in GWh)

Month	de	dk	nl	ch	cz	be	at	fr	si	hr	it	pl	hu	sk	es	pt	total
2020/4	106.48	13.43	59.02	33.05	28.16	40.27	19.90	163.03	13.98	15.67	118.41	37.96	18.44	0.00	0.00	0.00	667.79
2020/5	118.65	15.10	71.18	34.94	37.26	43.22	21.04	181.18	15.39	19.82	140.42	53.13	24.14	10.62	0.00	0.00	786.10
2020/6	116.81	15.96	78.05	36.60	35.15	43.87	18.36	173.29	14.98	16.99	149.37	51.52	30.57	14.40	0.00	0.00	795.91
2020/7	111.90	15.18	59.81	31.35	32.64	39.07	17.32	157.82	14.07	15.99	133.05	45.15	27.44	13.92	0.00	0.00	714.72
2020/8	115.55	17.70	63.84	35.62	30.87	41.01	15.28	157.87	14.72	18.68	121.80	50.66	40.21	13.29	0.00	0.00	737.10
2020/9	98.68	5.02	67.45	33.47	31.80	41.06	10.89	147.14	15.25	17.50	128.12	61.66	26.96	13.69	0.00	0.00	698.69
2020/10	116.89	11.77	64.89	36.28	36.10	46.01	18.23	166.16	16.60	18.49	128.34	59.17	33.88	15.18	5.31	0.00	773.30
2020/11	114.18	13.94	58.37	35.08	38.58	32.35	20.68	172.77	15.53	18.00	111.23	67.10	31.68	14.71	26.07	0.00	770.25
2020/12	112.46	17.18	69.66	34.03	39.21	44.53	28.74	185.16	16.17	21.13	136.63	77.79	34.40	16.62	32.83	7.55	874.08
2021/1	112.56	17.81	59.12	37.15	41.72	27.21	27.64	188.51	17.64	21.32	141.36	86.15	44.98	15.38	52.33	20.74	911.63
2021/2	103.71	24.53	64.38	35.95	40.08	33.69	26.66	173.01	14.82	19.73	118.64	79.51	39.79	12.99	51.97	37.03	876.50
2021/3	128.38	26.30	60.30	41.91	43.74	43.73	20.96	207.65	16.34	22.05	142.97	75.59	42.34	15.01	93.12	44.54	1024.94

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Monthly Value of Netted Imbalances

Value of Netted Imbalances - Monthly Values (Million €)

Legend: DE, DK, NL, CH, CZ, BE, AT, FR, SI, HR, IT, PL, HU, SK, ES, PT

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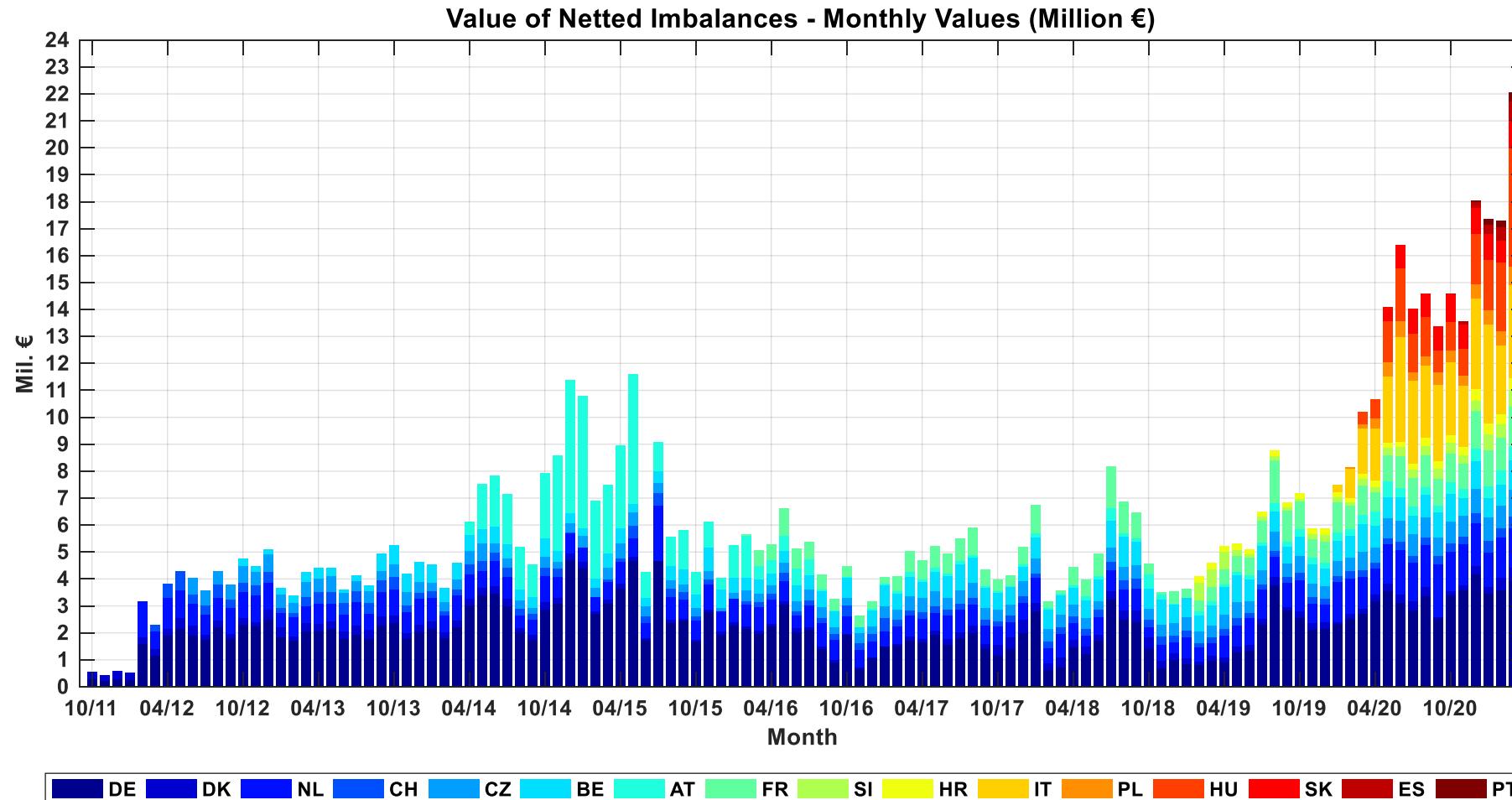
Monthly Value of Netted Imbalances
(last Year, in Million €)

Month	de	dk	nl	ch	cz	be	at	fr	si	hr	it	pl	hu	sk	es	pt	total
2020/4	3.19	0.24	0.96	0.23	0.56	0.80	0.55	0.70	0.19	0.23	1.96	0.35	0.70	0.00	0.00	0.00	10.65
2020/5	3.55	0.27	1.48	0.23	0.74	0.79	0.58	0.97	0.26	0.21	2.46	0.52	1.53	0.53	0.00	0.00	14.10
2020/6	3.11	0.32	1.65	0.30	0.79	0.85	0.35	1.18	0.32	0.21	3.90	0.56	1.98	0.86	0.00	0.00	16.40
2020/7	2.85	0.32	1.42	0.28	0.81	0.70	0.31	1.08	0.29	0.22	3.08	0.32	1.43	0.92	0.00	0.00	14.03
2020/8	3.35	0.34	1.59	0.29	0.72	0.86	0.27	1.19	0.35	0.29	2.67	0.37	1.46	0.86	0.00	0.00	14.60
2020/9	2.51	0.08	1.93	0.34	0.68	0.94	0.25	0.98	0.37	0.30	2.81	0.49	0.82	0.88	0.00	0.00	13.38
2020/10	3.40	0.14	1.49	0.31	0.78	1.05	0.42	1.08	0.39	0.28	2.72	0.42	1.07	1.00	0.03	0.00	14.58
2020/11	3.58	0.20	1.53	0.29	0.75	0.66	0.33	0.95	0.32	0.29	2.29	0.37	1.00	0.90	0.11	0.00	13.56
2020/12	4.18	0.31	1.60	0.36	0.92	1.03	0.45	1.40	0.39	0.42	3.36	0.55	1.86	0.97	0.19	0.06	18.03
2021/1	3.45	0.26	1.28	0.44	0.87	0.70	0.42	1.36	0.58	0.42	3.66	0.53	1.87	0.98	0.33	0.20	17.35
2021/2	3.59	0.45	1.48	0.37	0.82	0.78	0.54	1.22	0.48	0.38	2.54	0.54	2.54	0.82	0.49	0.23	17.28
2021/3	3.93	0.50	1.46	0.44	0.99	1.10	0.49	1.48	0.62	0.46	3.42	0.71	4.39	1.01	0.73	0.34	22.07

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Value of Netted Imbalances - Development

Value of Netted Imbalances - Monthly Values (Million €)
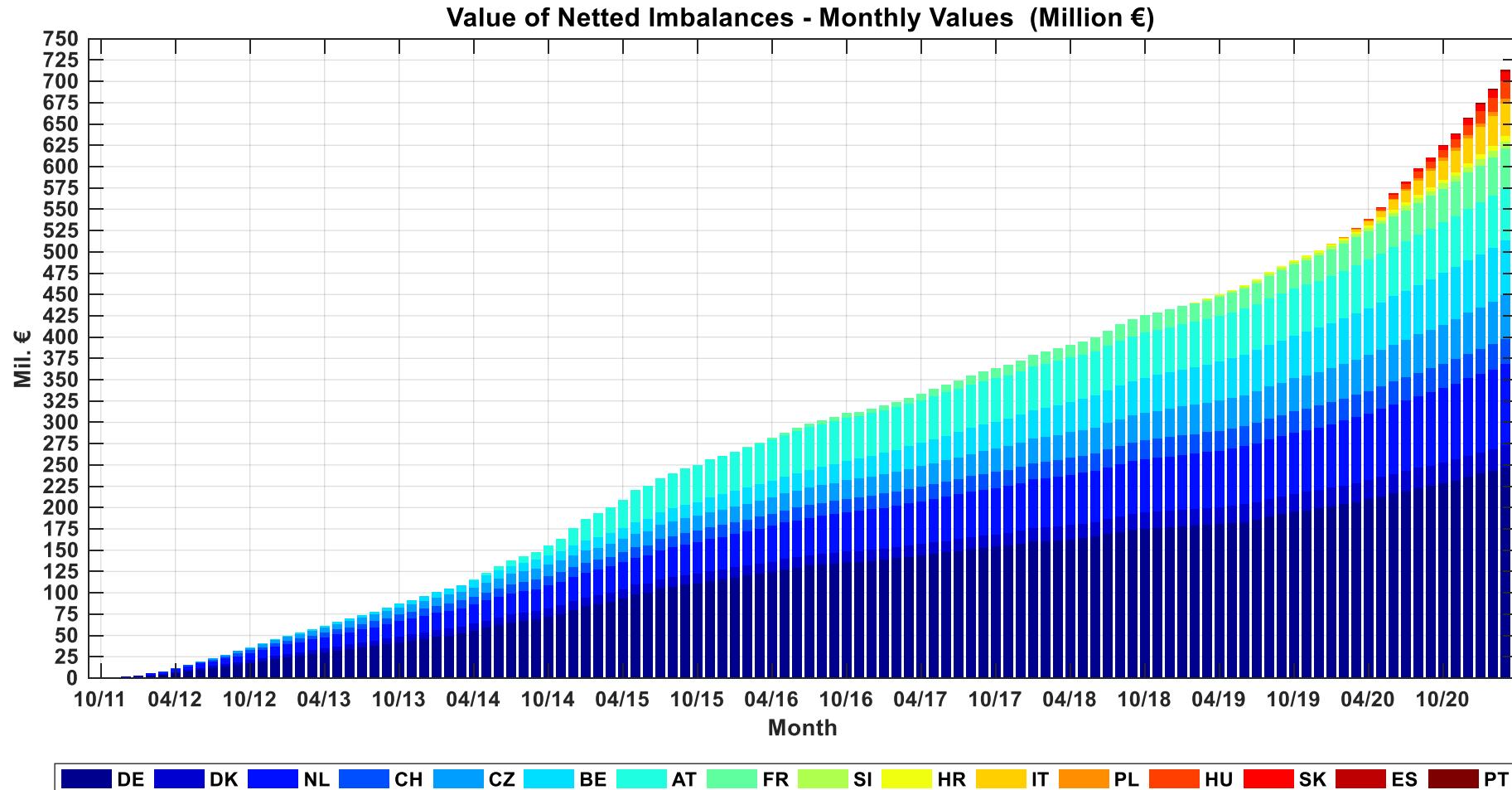
Monthly percentage of avoided pos. aFRR-activations
(last 6 Months)

Reduction of positive aFRR activation due to Imbalance Netting

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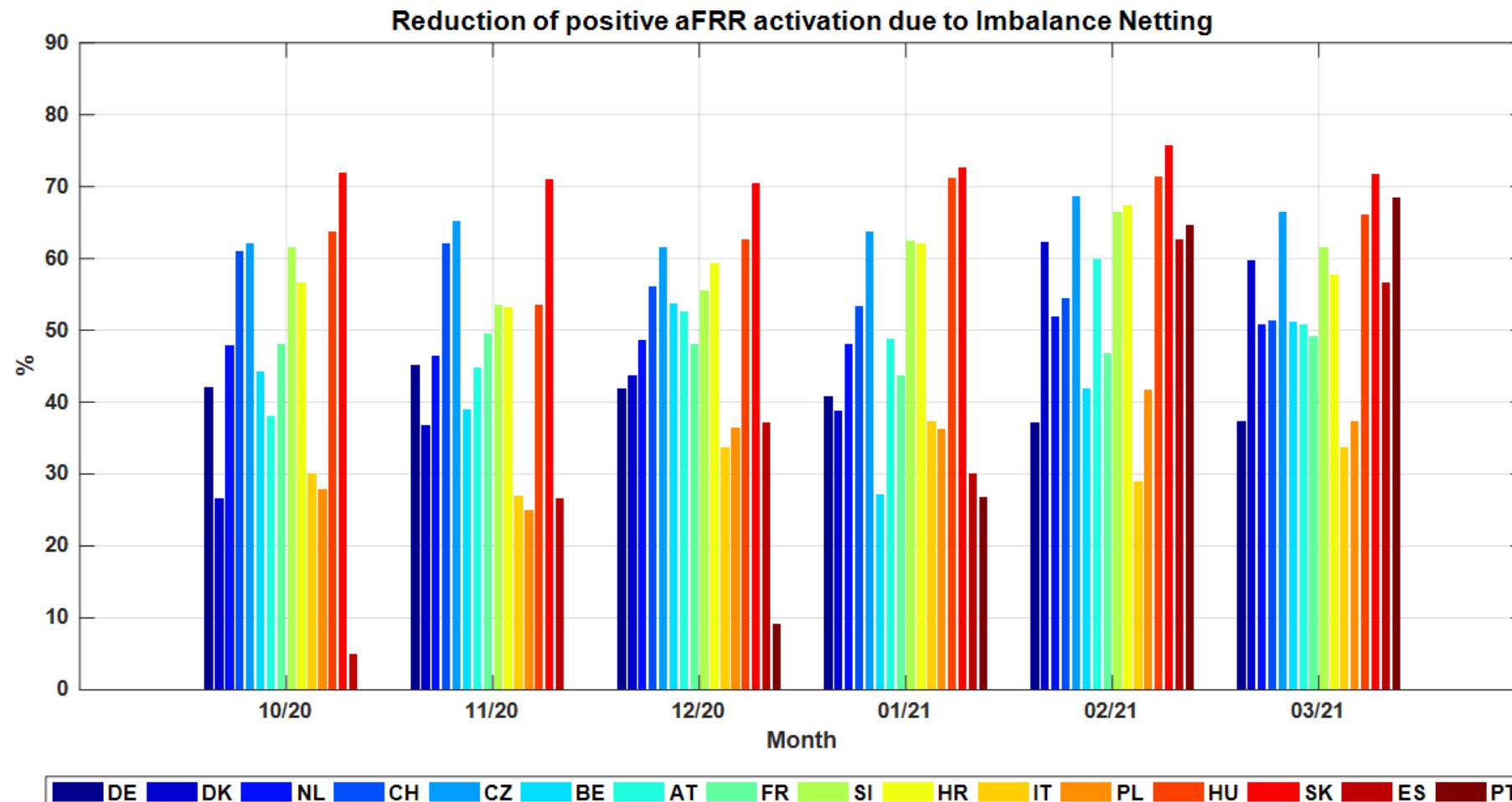
Monthly percentage of avoided neg. aFRR-activations
(last 6 Months)
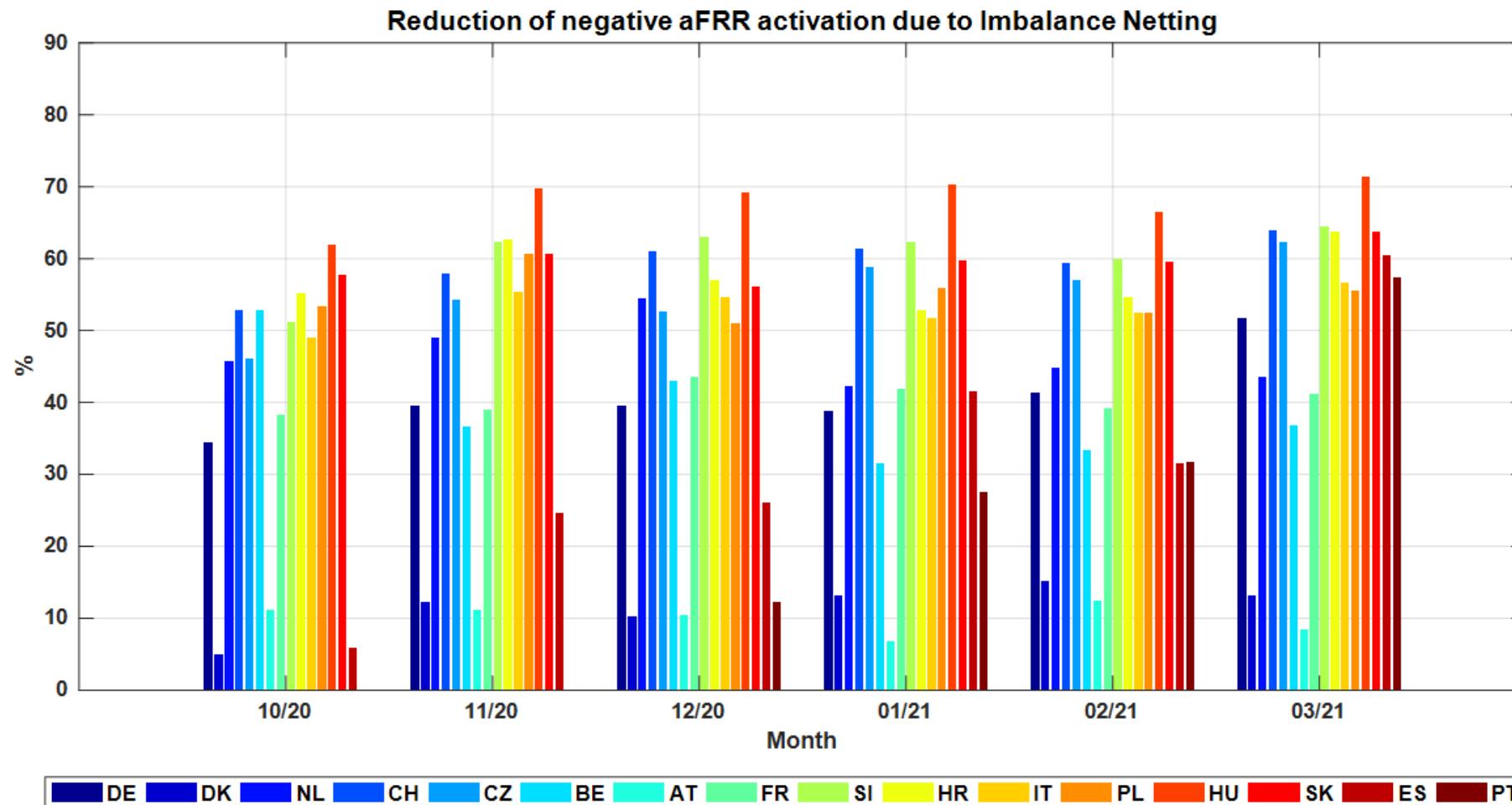
Cumulated Value of Avoided Activations

Cumulated Value of Netted Imbalances per Member Country (Million €)

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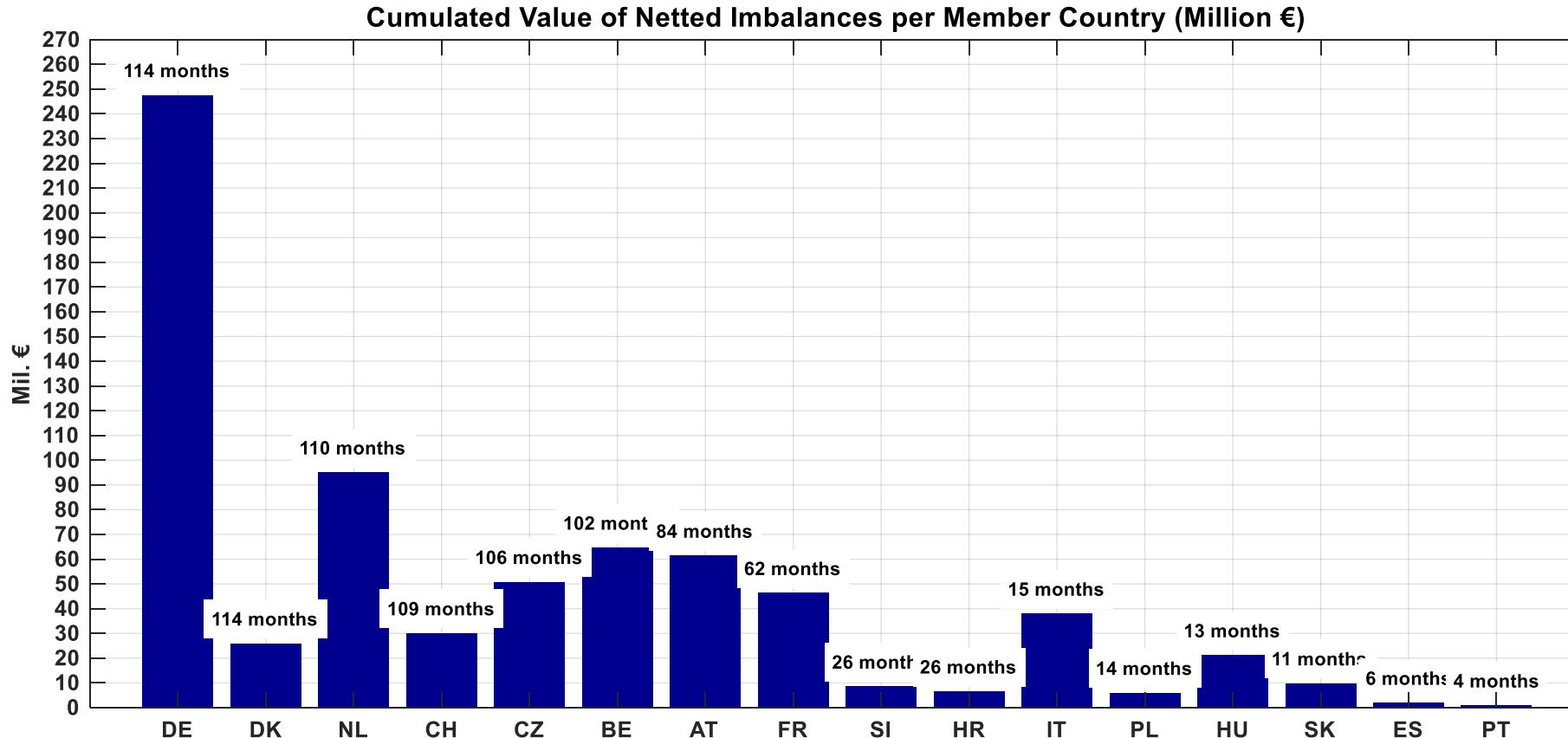
Percentage of avoiding loosing timestamps due to the second step of settlement method

Percentage of avoiding loosing timestamps - Last 6 Months

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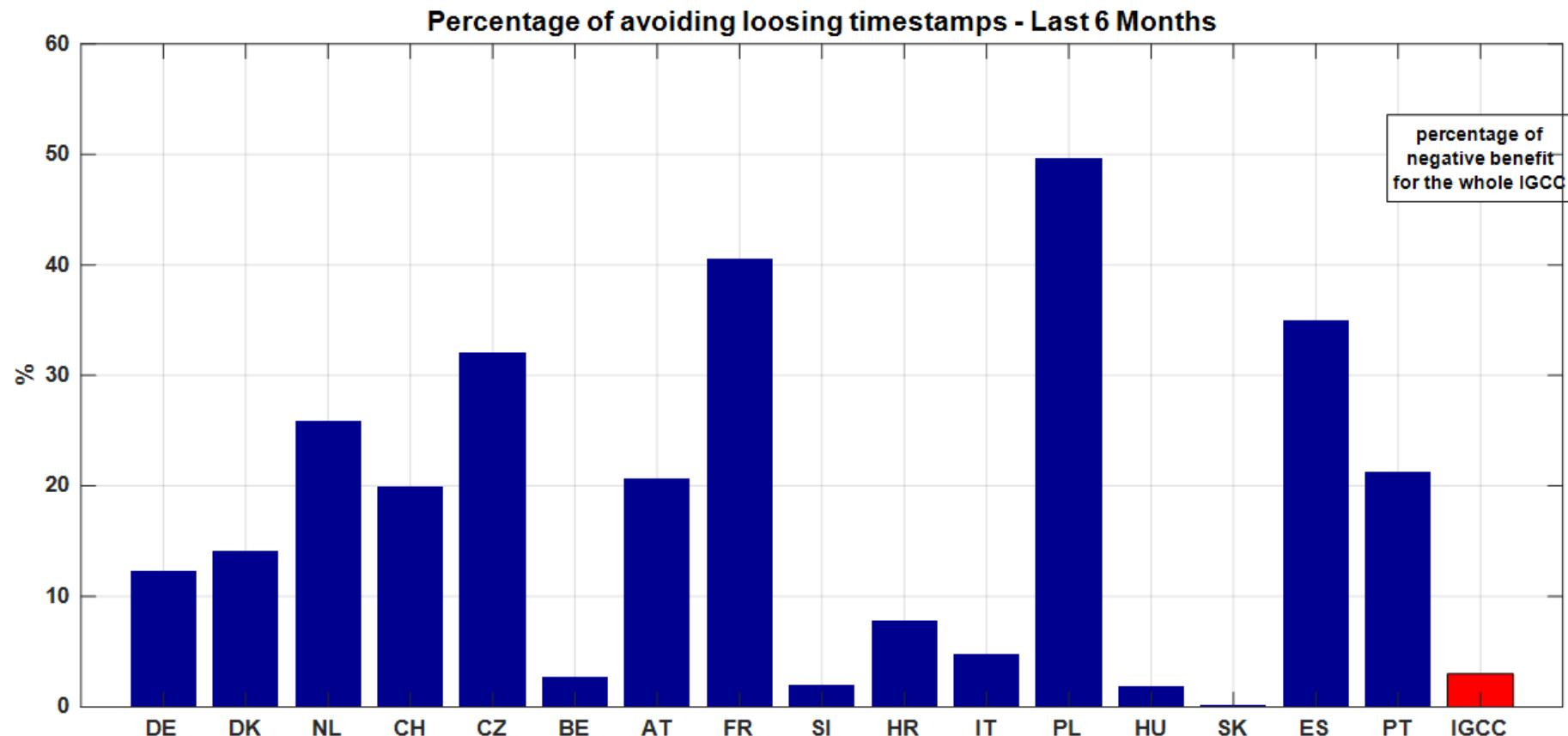
Average Value of Netted Imbalance per Country per Year in €/MWh
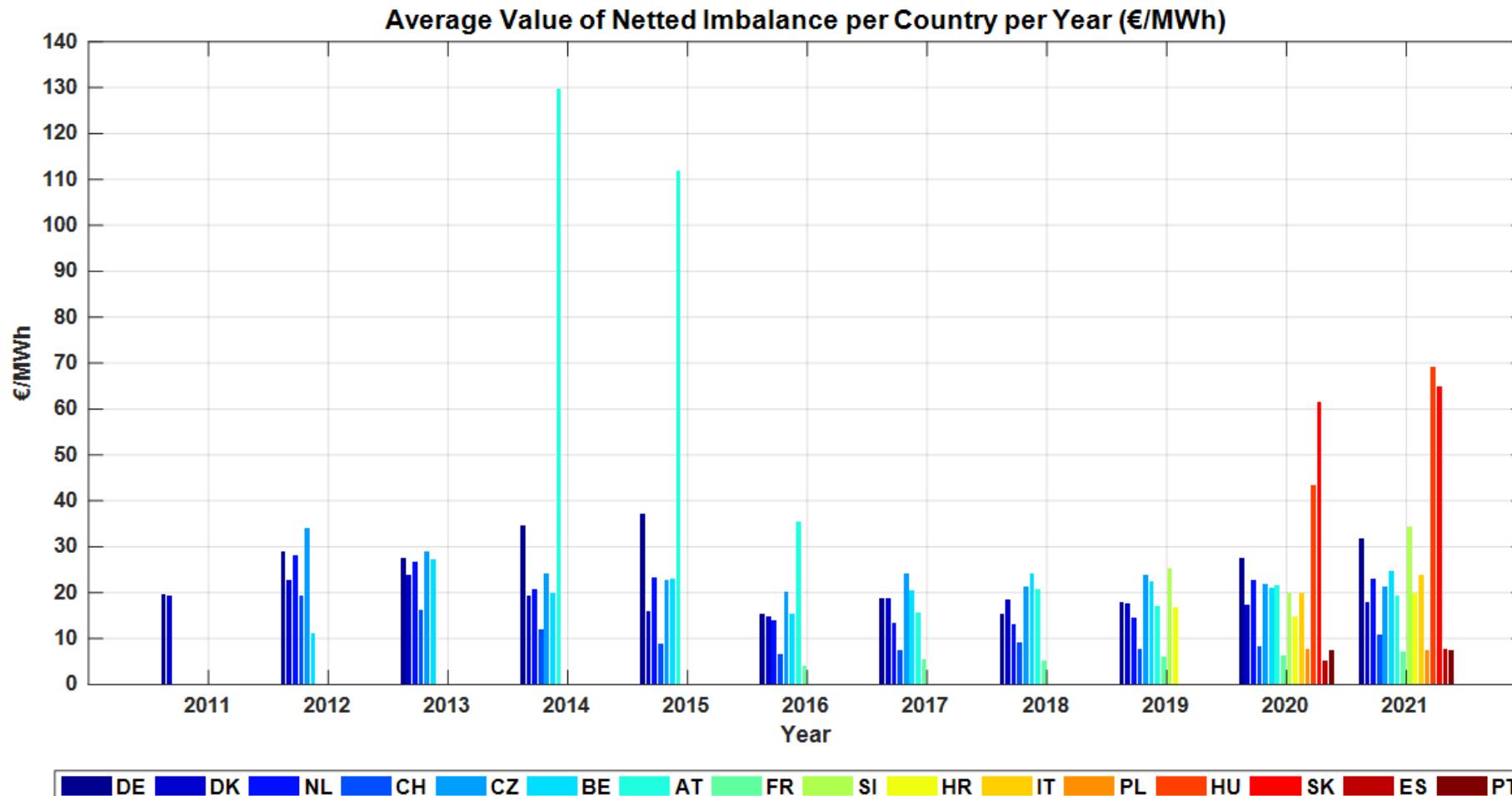
Average Price Paid for Imported Energy per Year

Average Price Paid for Imported Energy per Year

Average Value of avoided Upward Activation of Balancing Energy
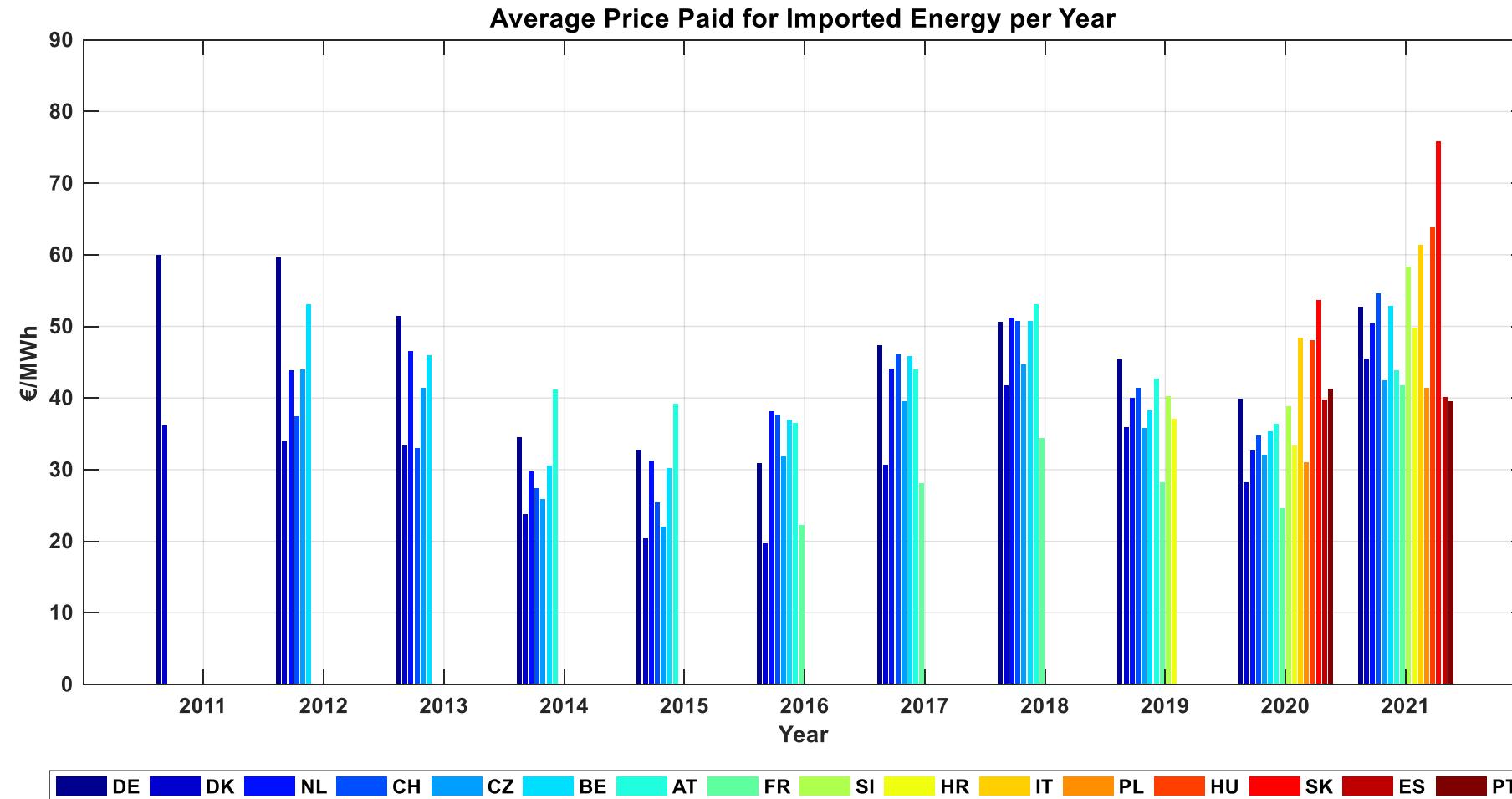
Average Value of Avoided Upward Activation of Balancing Energy

Average Price Received for Exported Energy per Year
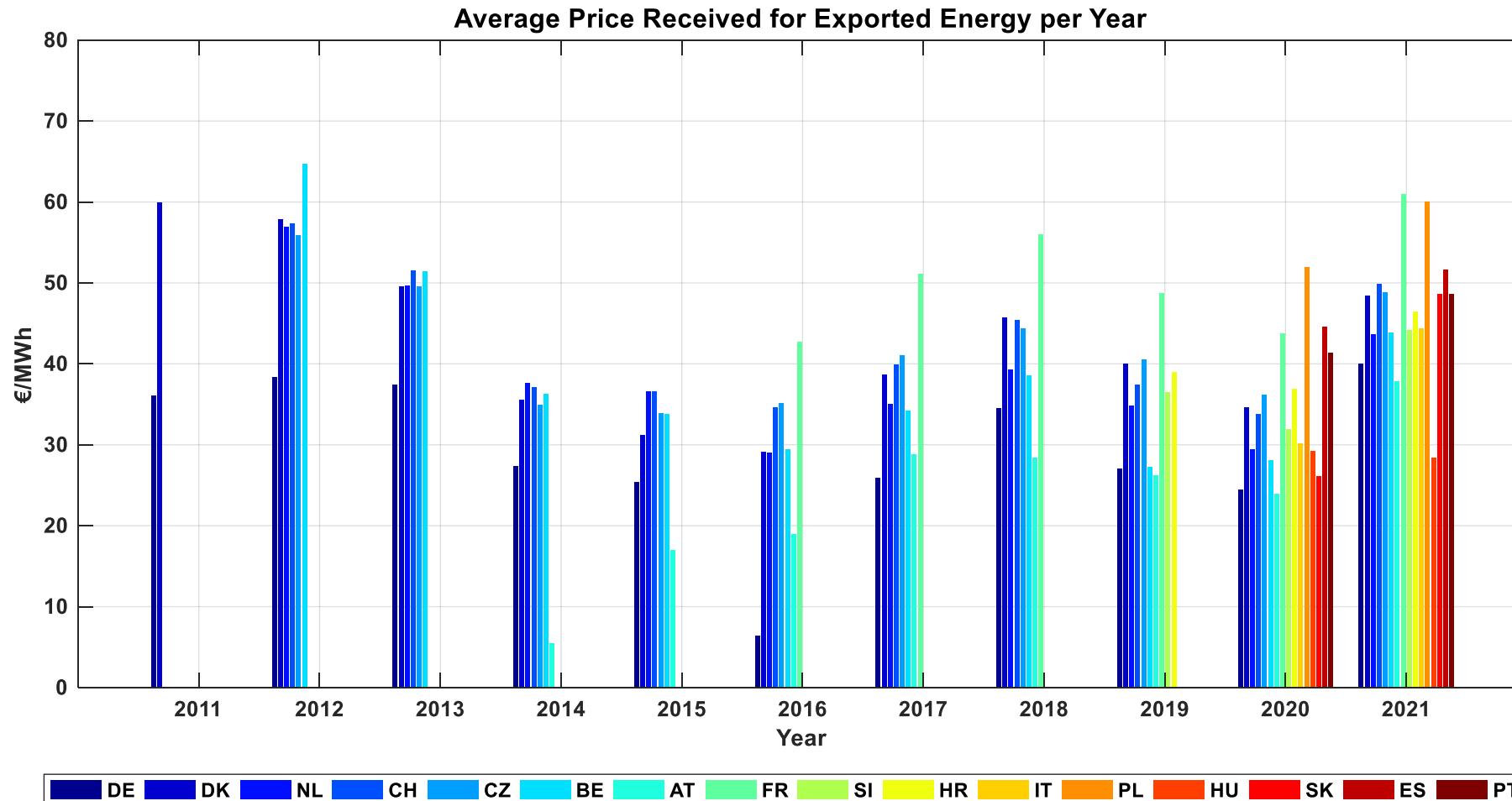
Average Price Received for Exported Energy per Year

Average Value of avoided Downward Activation of Balancing Energy

Average Value of Avoided Downward Activation of Balancing Energy

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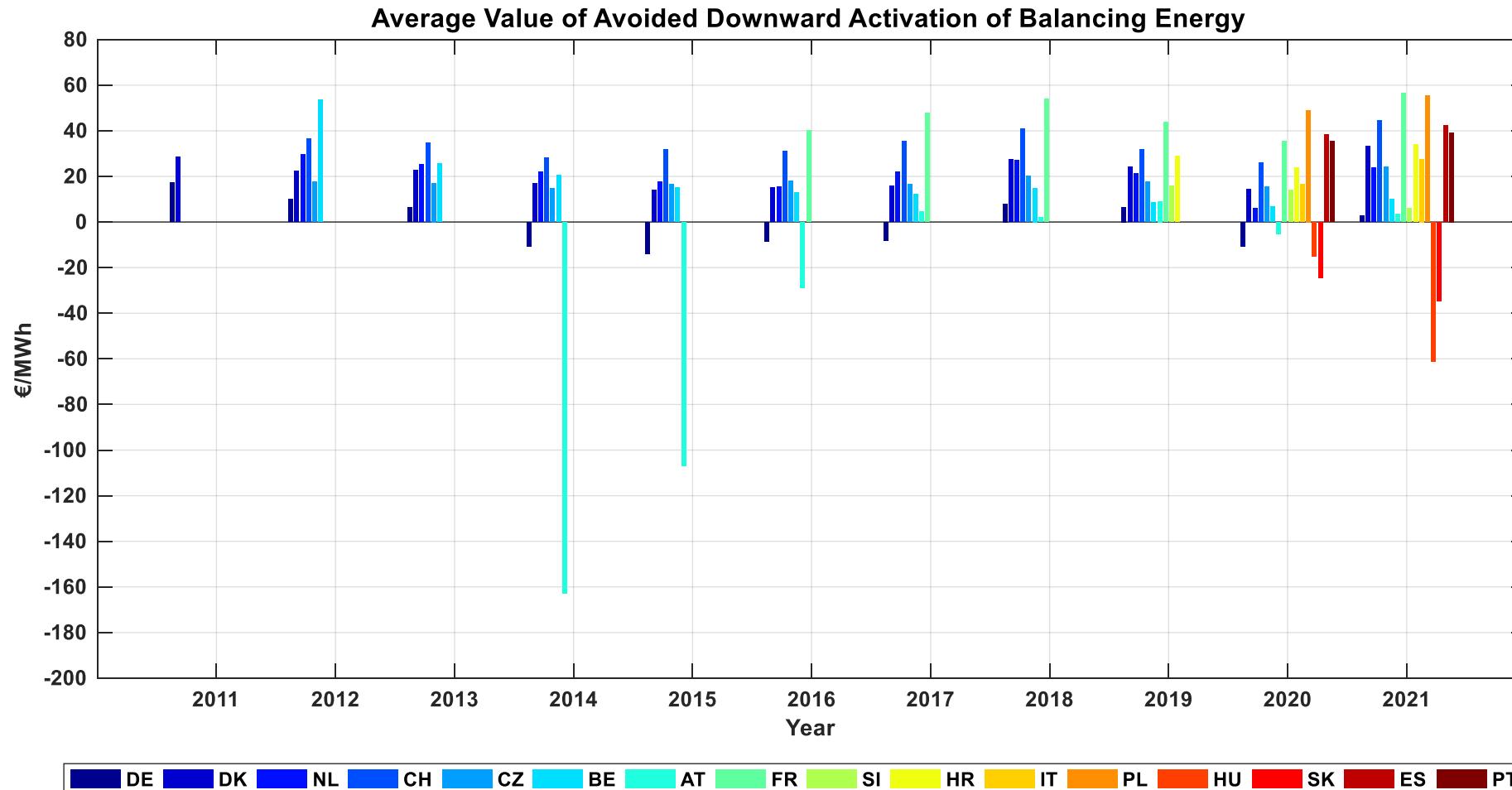
Appendix - Mathematical formulas of figures

- **Amount of netted imbalances (volume):**

$$E_{short+long,i} = E_{exp,i} + E_{Imp,i}$$

- **Amount of netted imbalances (value):**

$$R_{IGCC} = \sum_{i=1}^{n} \left(C_{Imp,i} - C'_{IGCC} \right) \cdot E_{Imp,i} + \sum_{i=1}^{n} \left(C'_{IGCC} - C_{Exp,i} \right) \cdot E_{Exp,i}$$

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Appendix - Mathematical formulas of figures

- **<u>Local value of the avoided activated positive balancing energy (imported by IGCC):</u>**

$$LV_{paid,i} = \sum_{i=1}^{n} C_{\mathrm{Imp},i} \cdot E_{\mathrm{Imp},i}$$

- **<u>Local value (received) of the avoided activated negative balancing energy (exported to IGCC):</u>**

$$LV_{received,i} = \sum_{i=1}^{n} C_{\mathrm{Exp},i} \cdot E_{\mathrm{Exp},i}$$

Appendix - Mathematical formulas of figures

- **Average price payed for imported energy:**

$$C_{paid,i} = \frac{\sum_{i=1}^{n} C_{\text{IGCC},i} \cdot E_{\text{Imp},i}}{\sum_{i=1}^{n} E_{\text{Imp},i}}$$

- **Average price received for exported energy:**

$$C_{received,i} = \frac{\sum_{i=1}^{n} C_{\text{IGCC},i} \cdot E_{\text{Exp},i}}{\sum_{i=1}^{n} E_{\text{Exp},i}}$$

Appendix - Mathematical formulas of figures

- **<u>Average Value of avoided Upward Activation of Balancing Energy (Upward Opportunity Price)</u>**

$$OP_{upward,i} = \frac{\sum_{i=1}^{n} C_{\text{Imp},i} \cdot E_{\text{Imp},i}}{\sum_{i=1}^{n} E_{\text{Imp},i}}$$

- **<u>Average Value of avoided Downward Activation of Balancing Energy (Downward Opportunity Price)</u>**

$$OP_{downward,i} = \frac{\sum_{i=1}^{n} C_{\text{Exp},i} \cdot E_{\text{Exp},i}}{\sum_{i=1}^{n} E_{\text{Exp},i}}$$