

2022

Annual Report



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Chapter 1

One new member in 2022

CROPEX MEMBERS

In 2022 one new member joined CROPEX Markets. Company **Second Foundation a.s.** from Czech Republic joined both Day Ahead and Intraday Market, while four existing members on the Day Ahead Market became members on Intraday Market as well. Those are **Axpo Trading Ltd.**, **ALPIQ Energy SE**, **ENERGOVIA EOOD** and **D. TRADING d.o.o.** On the other hand, **EDF TRADING LIMITED** and **Energy Supply Ltd.** left the Croatian electricity market. By the end of 2022, there were altogether **26** registered members active on Day Ahead Market, of which **23** on Intraday Market.

	Member		Country	DAM	ID
1	ALPIQ ENERGY SE		CH	✓	✓
2	Axpo Trading Ltd.		CH	✓	✓
3	Centrica Energy Trading A/S		DK	✓	✓
4	ČEZ, a. s.		CZ	✓	✓
5	Danske Commodities A/S		DK	✓	✓
6	D.TRADING d.o.o.		UA	✓	✓
7	EDF TRADING LIMITED*		UK	✓	
8	ELEKTRIČNI FINANČNI TIM d.o.o.		SI	✓	✓
9	Enel Global Trading S.p.A.		IT	✓	
10	Energi Danmark A/S		DK	✓	✓
11	ENERGOVIA EOOD		BG	✓	✓
12	Energy Supply Ltd.*		BG	✓	
13	ENNA Opskrba d.o.o.		HR	✓	✓
14	E.ON Energija d.o.o.		HR	✓	✓
15	EPS Trgovanje d.o.o.		SI	✓	
16	GEN-I Hrvatska d.o.o.		HR	✓	✓
17	HOLDING SLOVENSKE ELEKTRARNE d.o.o.		SI	✓	✓
18	HRVATSKA ELEKTROPRIVREDA d.d.		HR	✓	✓
19	Croatian Transmission System Operator Ltd.		HR	✓	✓
20	CROATIAN ENERGY MARKET OPERATOR Ltd.		HR	✓	✓
21	IE-ENERGY d.o.o.		HR	✓	✓
22	INTERENERGO Ltd.		SI	✓	✓
23	MFT Energy A/S		DK	✓	✓
24	MVM Partner d.o.o.		HU	✓	✓
25	PETROL d.d.		SI	✓	✓
26	Second Foundation a.s.		CH	✓	✓
27	TrailStone Renewables GmbH		DE	✓	✓
28	Vitol Gas and Power BV		NL	✓	

* EDF TRADING LIMITED left the Croatian electricity market in April 2022, while Energy Supply Ltd. left in October 2022.

Chapter 2

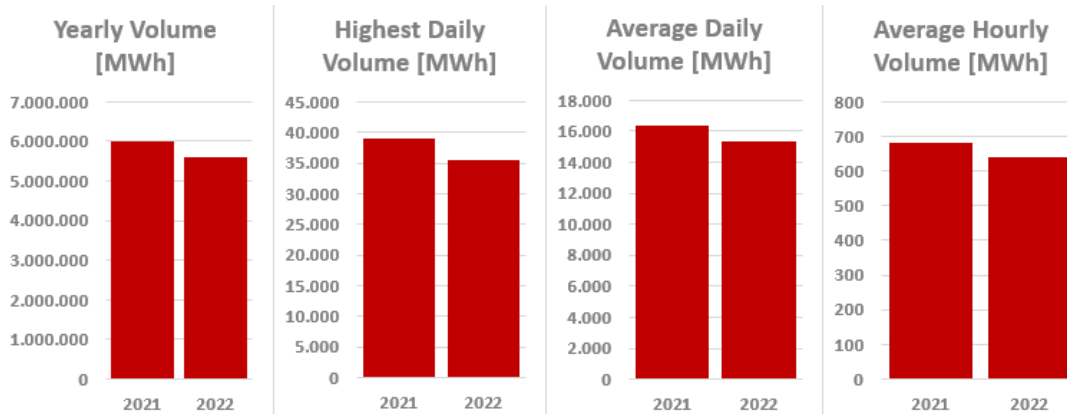
General 2022 - Trading Data

CROPEX DAY AHEAD MARKET

Total Traded Volume on Day Ahead Market in 2022 decreased slightly compared to 2021.

In general, an increase in prices is recorded compared to 2021; both Day Ahead Average Base Price and Average Peak Price.

Volume Traded [MWh]	2022	2021	
Total	5,590,392	5,967,193	6.3% ↓
Highest Monthly	696,183	791,550	12.0% ↓
Average Monthly	465,866	497,266	6.3% ↓
Highest Daily	35,374	38,785	8.8% ↓
Average Daily	15,316	16,348	6.3% ↓
Highest Hourly	1,927	2,036	5.4% ↓
Average Hourly	638	681	6.3% ↓



Price [EUR/MWh]	2022	2021	
Base Average	272.40	114.70	137.5% ↑
Peak Average	291.23	126.50	130.2% ↑
Highest hourly	920.00	533.20	72.5% ↑
Lowest hourly	-50.10	-263.30	80.9% ↑

CROPEX DAY AHEAD MARKET

General 2022 data – Monthly Volumes and Prices

2022 Volumes [MWh]

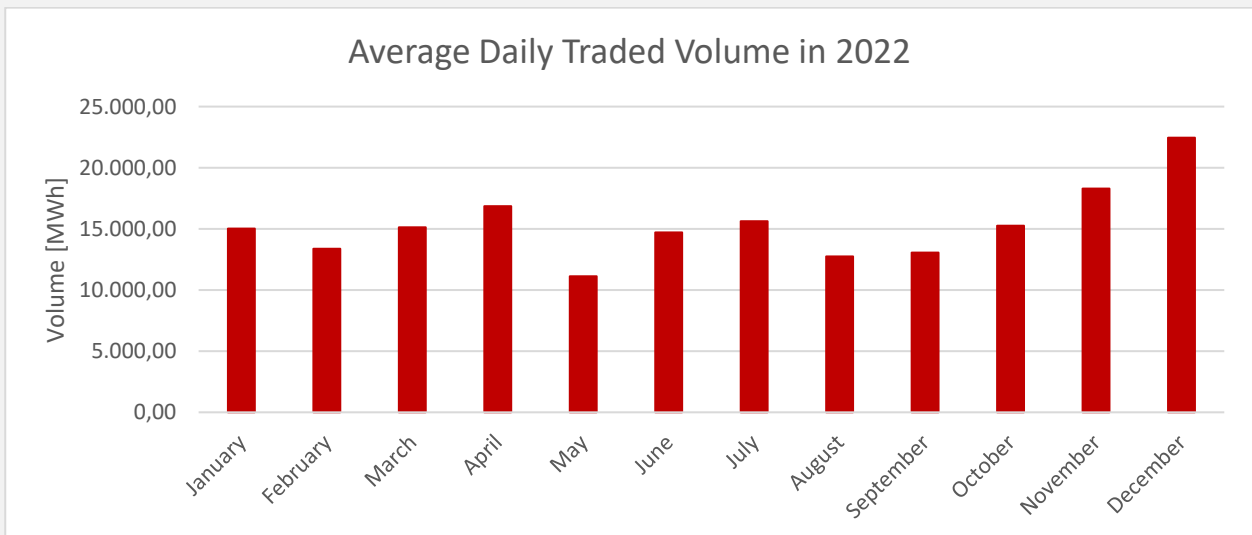
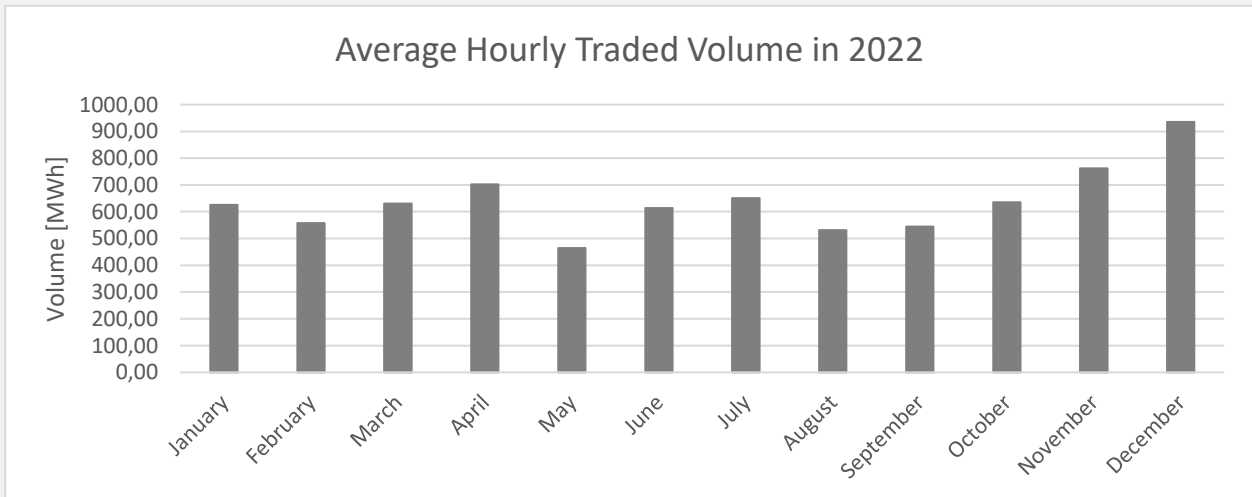
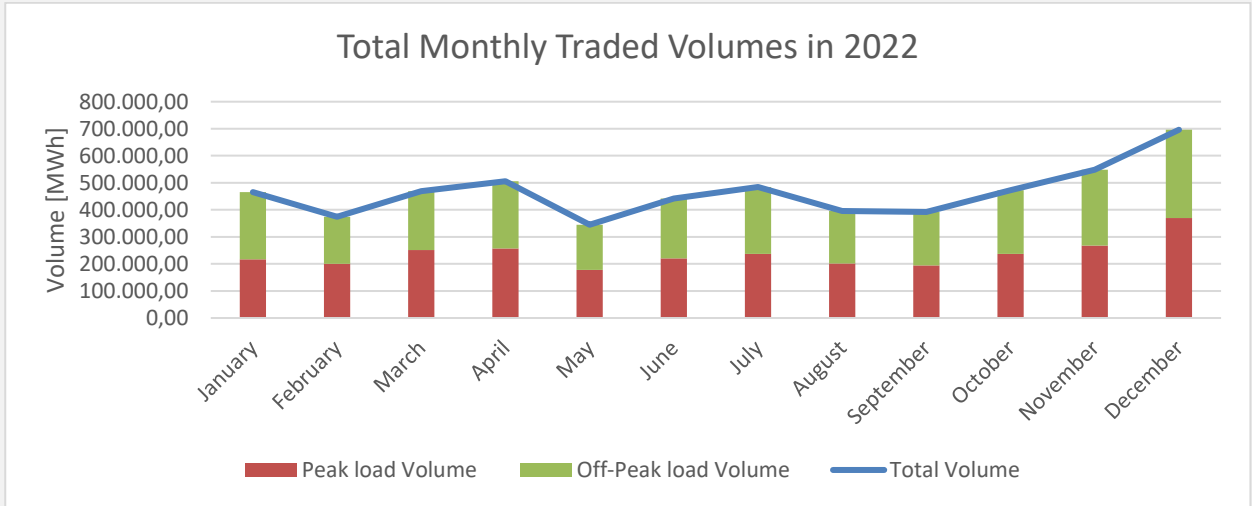
Month	Base Volume	Peak Volume	Off-Peak Volume	Average Daily Traded Volume	Average Hourly Traded Volume
January	465,503.80	217,277.50	248,226.30	15,016.25	625.68
February	374,707.50	200,139.10	174,568.40	13,382.41	557.60
March	468,708.10	250,917.20	217,790.90	15,119.62	630.83
April	505,366.80	256,881.10	248,485.70	16,845.56	701.90
May	344,993.20	177,600.20	167,393.00	11,128.81	463.70
June	441,470.80	220,659.10	220,811.70	14,715.69	613.15
July	484,297.70	237,337.50	246,960.20	15,622.51	650.94
August	395,184.40	201,573.10	193,611.30	12,747.88	531.16
September	391,887.90	194,130.80	197,757.10	13,062.93	544.29
October	473,254.20	236,819.00	236,060.20	15,266.26	635.24
November	548,834.20	267,905.00	280,929.20	18,294.47	762.27
December	696,183.90	369,254.60	326,929.30	22,457.55	935.73

2022 Prices [EUR/MWh]

Month	Average Baseload Price	Average Peak Price	Average Off-Peak Price	Hourly Minimum Price	Hourly Maximum Price
January	206.74	232.54	180.93	7.07	399.46
February	195.40	211.14	179.65	60.01	349.00
March	293.81	304.21	283.38	81.40	700.00
April	192.50	191.50	193.50	0.00	450.05
May	202.03	199.32	204.75	10.00	360.00
June	245.29	249.67	240.92	23.33	503.98
July	375.44	386.05	364.83	30.80	708.99
August	493.67	505.48	481.87	86.82	920.00
September	392.69	423.26	362.12	36.34	746.20
October	196.71	216.12	177.54	65.25	570.67
November	219.42	257.70	181.14	1.09	503.55
December	246.72	308.62	184.81	-50.10	665.01

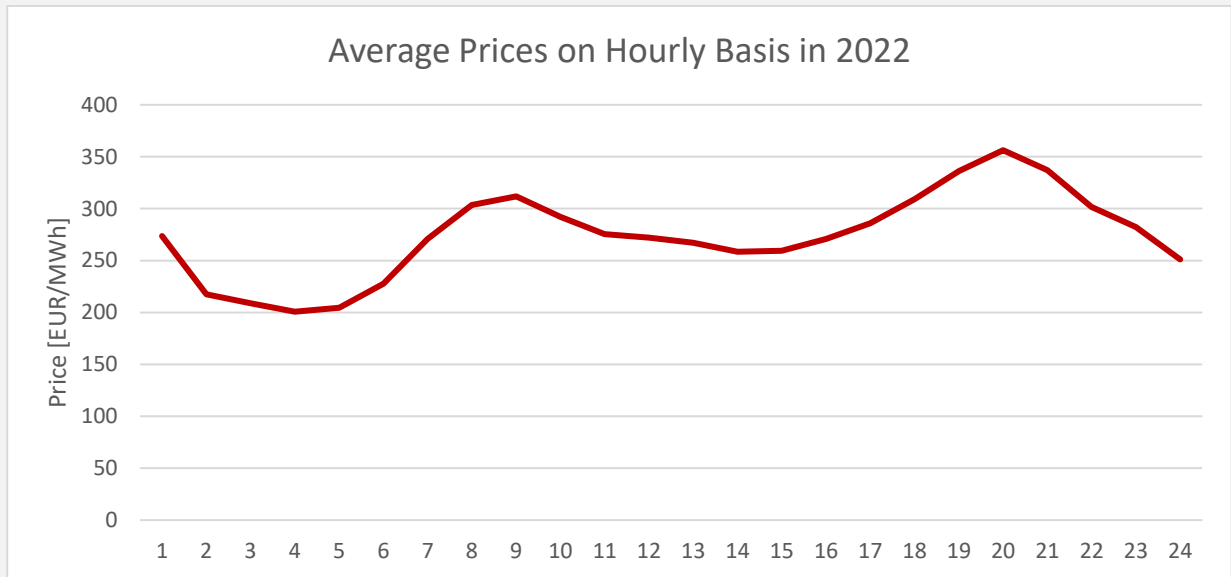
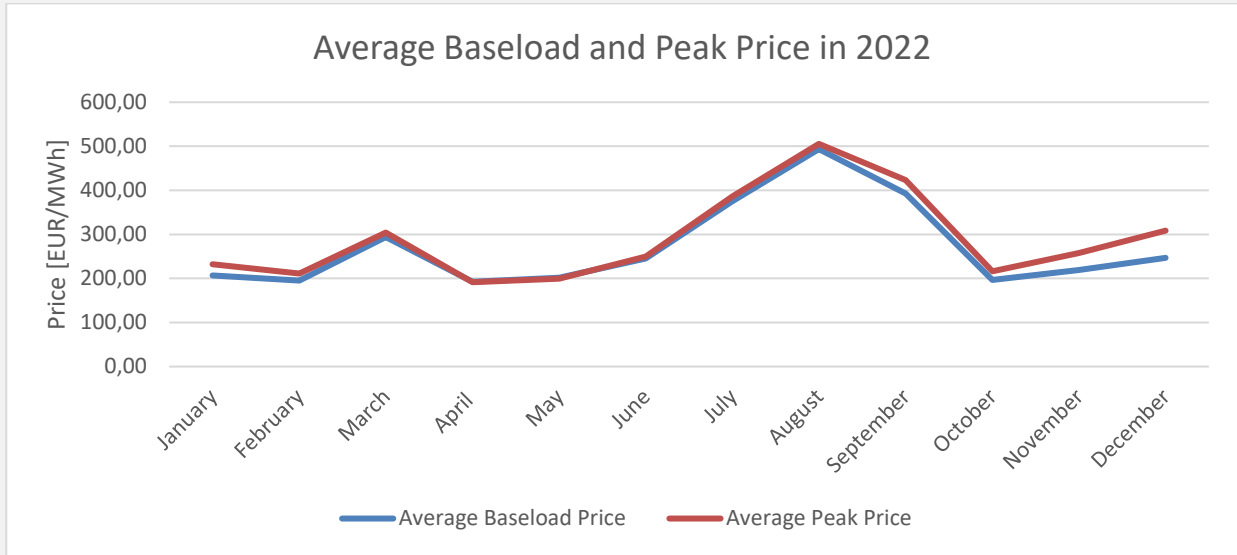
**CROPEX
DAY AHEAD
MARKET**

2022 Charts – Volumes



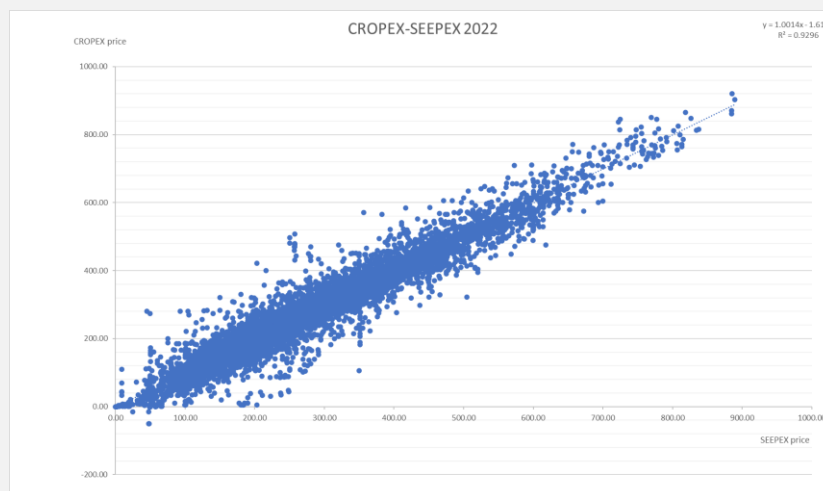
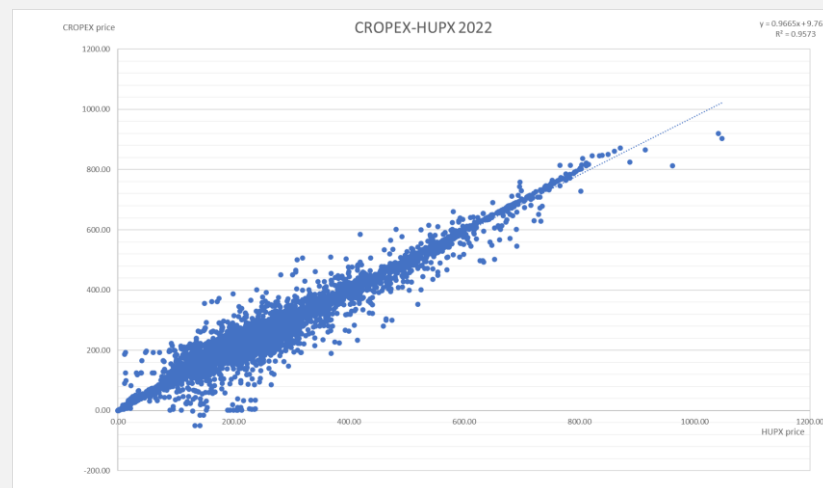
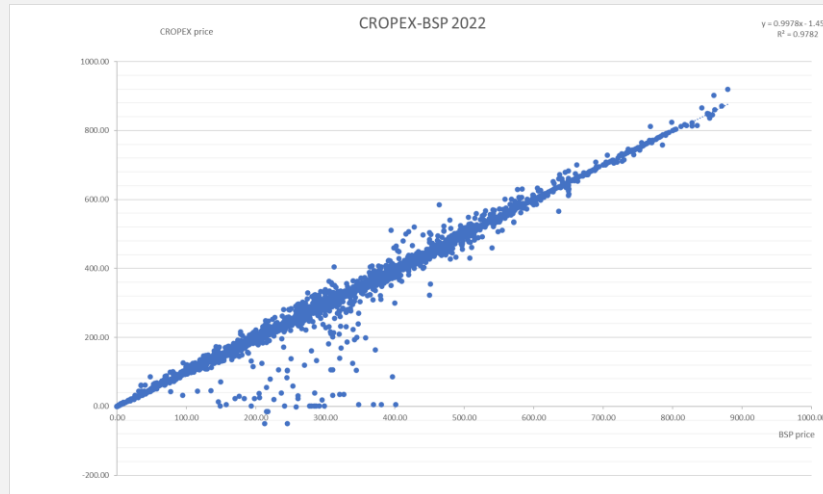
CROPEX DAY AHEAD MARKET

2022 Data – Prices



CROPEX DAY AHEAD MARKET

2022 Data – Price Comparison



CROPEX DAY AHEAD MARKET

Liquidity Indicators

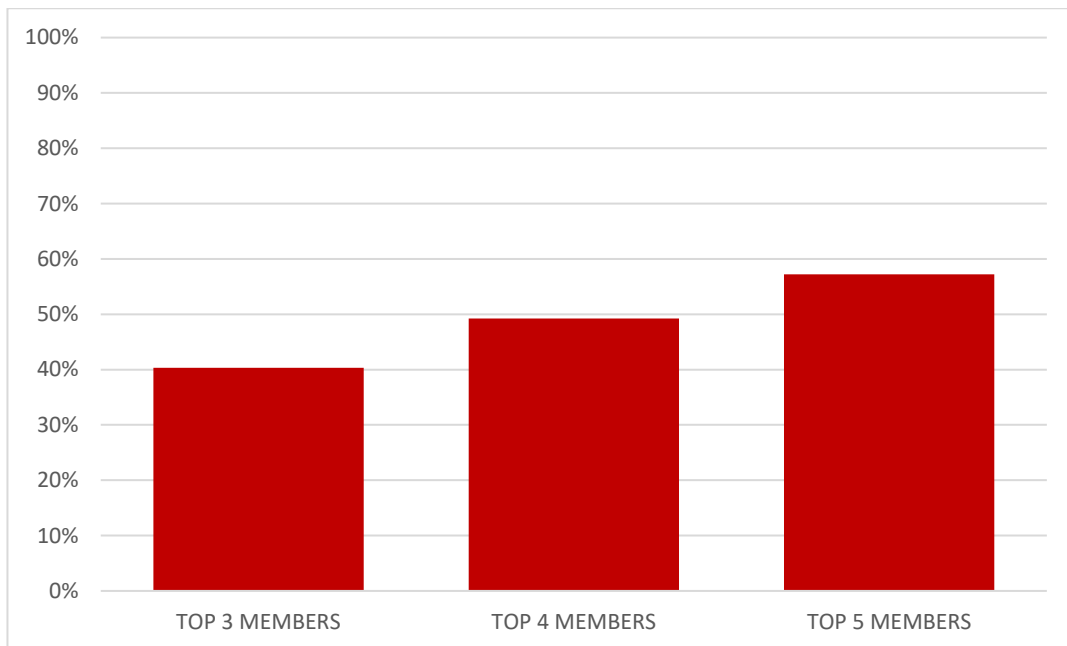
Market with the **Herfindahl–Hirschman Index** of less than 1,000 considers to be a competitive marketplace, an HHI of 1,000 to 1,800 considers to be a moderately concentrated marketplace and an HHI of 1,800 or greater considers to be a highly concentrated marketplace.

Herfindahl–Hirschman Index	
Buy	966
Sell	1,014
Total	886

According to the HHI analysis **CROPEX Day Ahead Market** is a **competitive market**, thus providing all the Members enough liquidity for their trading activities.

Concentration ratio (“CR”) is a traditional structural measure of market concentration based on market shares, for the concentration ratio “CR3” measures the total market shares of the top 3 Members, by Trading Volume.

Concentration Ratios – CR3, CR4, CR5



A concentration ratio that ranges from 0% to 50% indicates that the industry is perfectly competitive and is considered a low concentration.

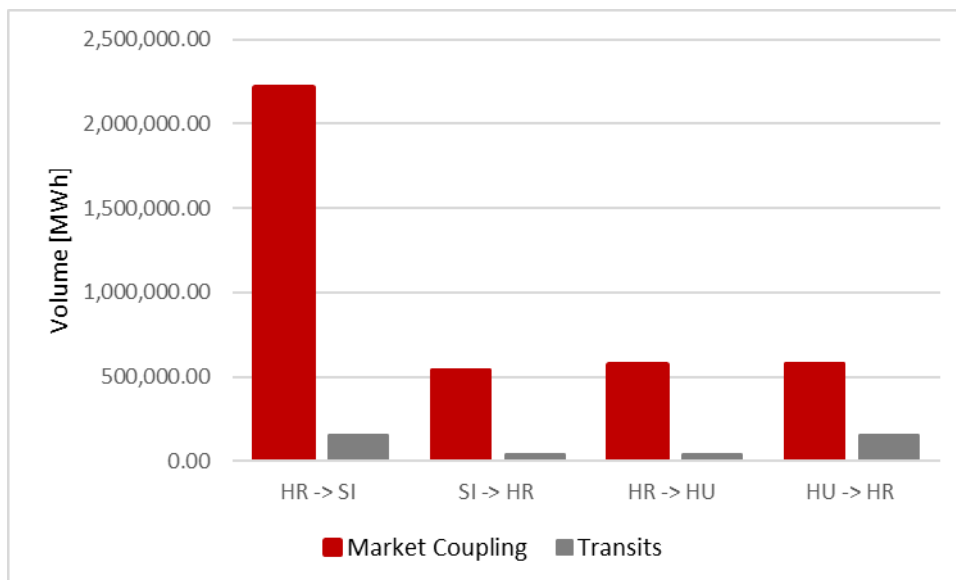
CROPEX DAY AHEAD MARKET

Market Coupling

Since **2018**, Croatian Day Ahead Market is coupled to the European SDAC market via **Croatian-Slovenian** border, while from **June 2022**, it is coupled via **Croatian-Hungarian** border as well.

Volume [MWh]	2022
CROPEX Volume Traded	5,590,393
Market Coupling Total	3,913,994
Market Coupling flow HR -> SI	2,216,346
Market Coupling flow SI -> HR	539,610
Market Coupling flow HR -> HU	574,446
Market Coupling flow HU -> HR	583,592
Transit Total Volume	198,916
Transit HR -> SI	157,619
Transit SI -> HR	41,298
Transit HR -> HU	41,298
Transit HU -> HR	157,619

Market Coupling Volume – Transit Volumes



Chapter 3

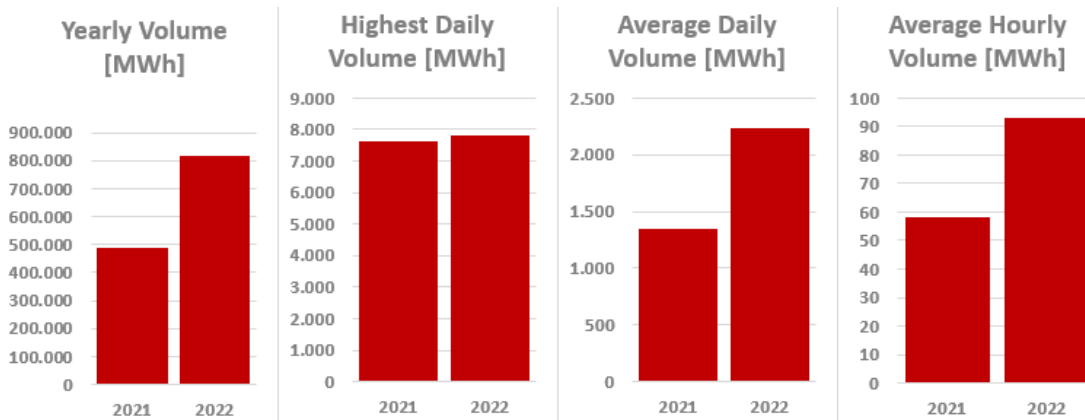
General 2022 - Trading Data

CROPEX INTRADAY MARKET

Following the successful coupling **through SIDC** in 2019, CROPEX Intraday Market continued with its growth in 2022, with record volumes achieved on a yearly, monthly and daily basis.

Additionally, with the successful introduction of the API service in 2021, an increase in the number of **API trades** was recorded in **2022**, resulting in **13%** of **API trades** out of **total trade**.

Volume Traded [MWh]	2022	2021	
Total	815,576	486,980	67.5 % ↑
Highest Monthly	110,496	72,213	53.0 % ↑
Average Monthly	67,965	40,581	67.5 % ↑
Highest Daily	7,771	7,597	2.3 % ↑
Average Daily	2,230	1,334	67.2 % ↑
Highest Hourly	942	590	59.7 % ↑
Average Hourly	93	58	60.3 % ↑



Price [EUR/MWh]	2022	2021	
Volume Weighted Average Price	268.40	38.30	133.1 % ↑
Highest Trade Price	1155.00	214.83	84.0 % ↑
Lowest Trade Price	-50.00	-12.57	31.9 % ↓
Number of Trades	241,534	70,984	90.6 % ↑

CROPEX INTRADAY MARKET

General 2022 Data – Monthly Volumes and Prices

2022 Volumes [MWh]

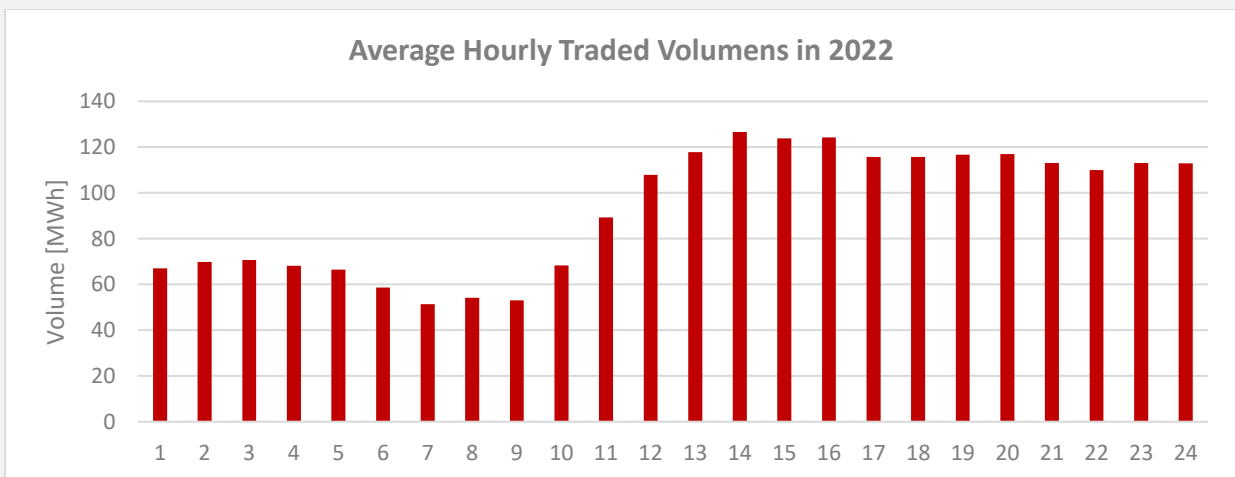
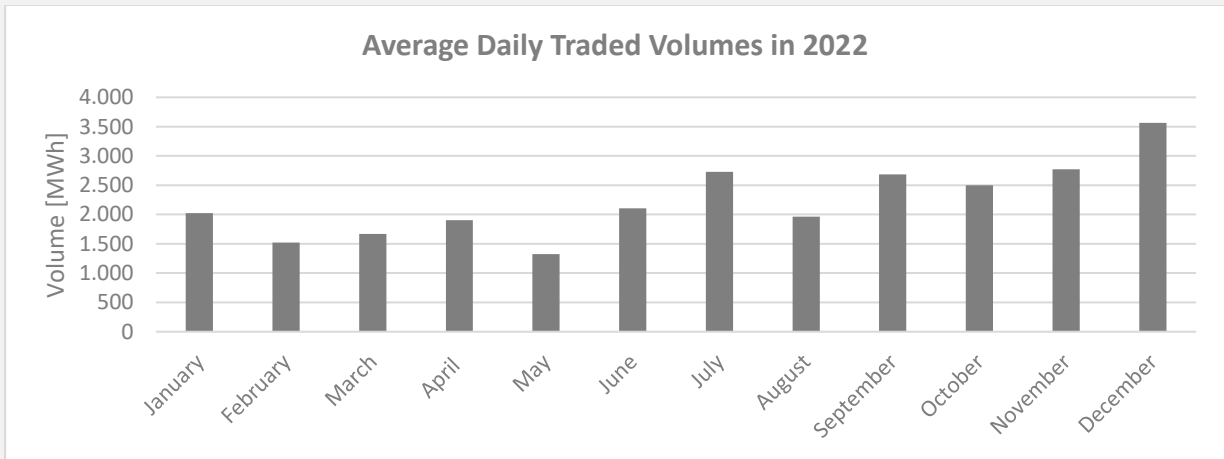
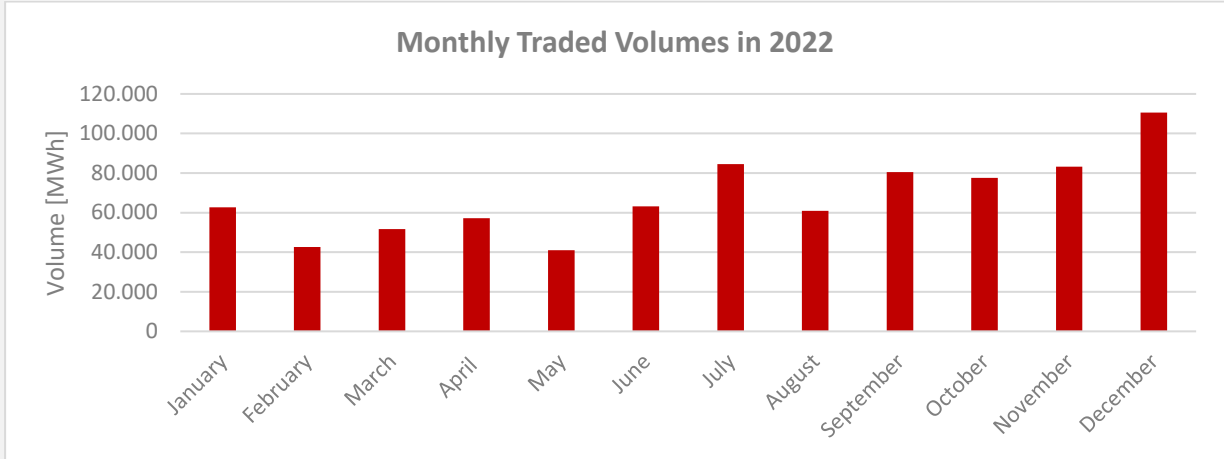
Month	Total Traded Volume	Highest Daily Traded Volume	Average Daily Traded Volume	Highest Hourly Traded Volume	Average Hourly Traded Volume
January	62,660	5,226	2,021	349	84
February	42,672	4,117	1,524	395	63
March	51,658	3,027	1,666	428	70
April	57,117	3,243	1,904	393	79
May	41,059	2,707	1,324	244	55
June	63,189	4,151	2,106	424	88
July	84,608	4,893	2,729	580	114
August	60,851	3,847	1,963	570	82
September	80,510	6,226	2,684	942	112
October	77,530	6,440	2,501	844	104
November	83,226	6,597	2,774	866	116
December	110,496	7,771	3,564	702	149

2022 Prices [EUR/MWh]

Month	Weighted Average Price	Peak Weighted Average Price	Off-Peak Weighted Average Price	Lowest Trade Price	Highest Trade Price
January	204.26	229.68	178.93	-12	834
February	189.78	203.69	175.87	8	412
March	283.69	292.19	275.08	5	707
April	182.28	182.22	182.34	-50	460
May	198.94	193.18	204.80	1	432
June	249.74	256.52	242.96	0	660
July	369.54	374.47	364.54	1	908
August	485.87	496.27	475.39	78	1155
September	387.17	420.70	353.66	11	917
October	197.74	214.37	181.28	33	745
November	220.36	255.66	185.05	5	672
December	251.40	309.72	193.09	-50	763

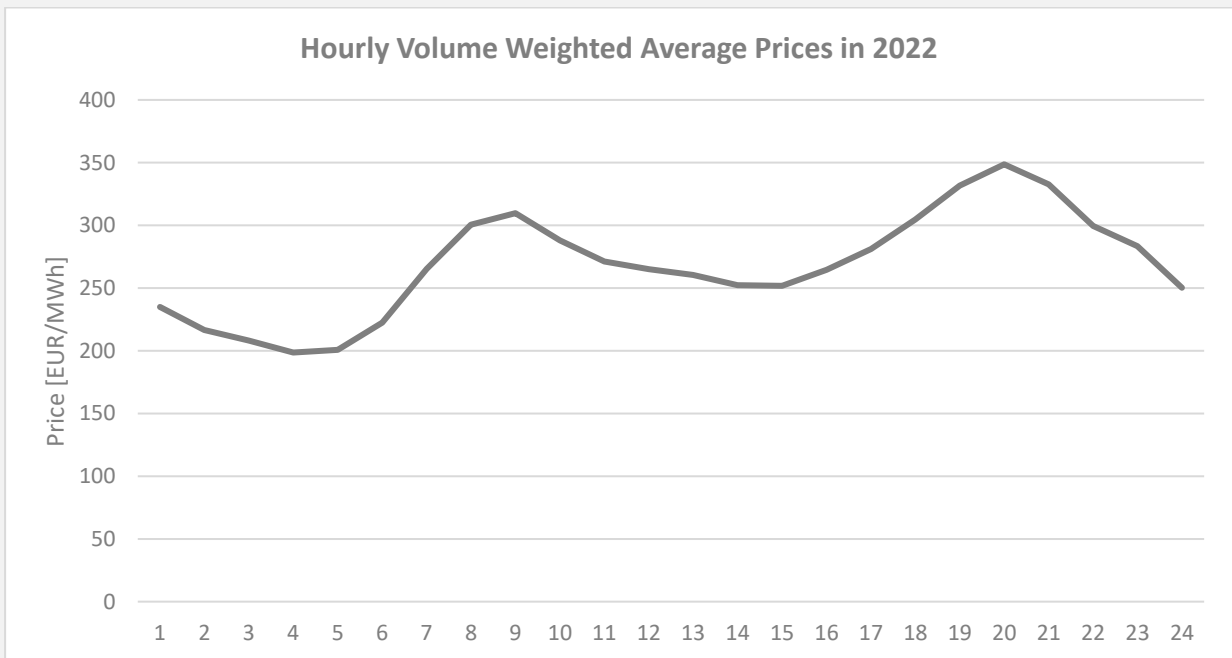
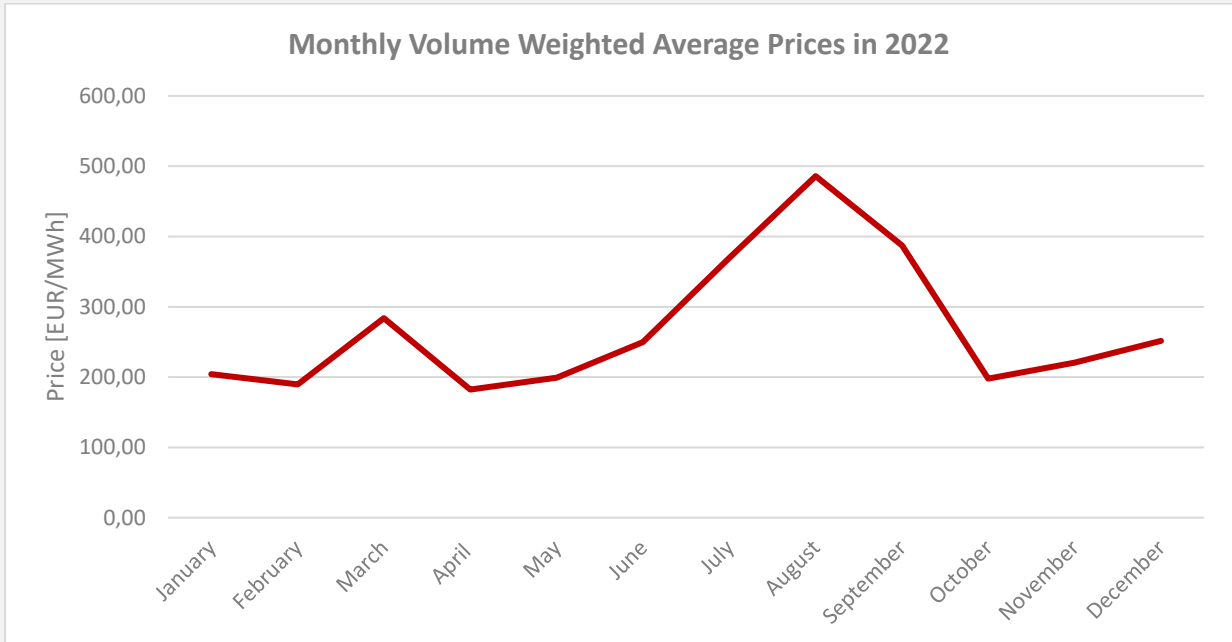
**CROPEX
INTRADAY
MARKET**

2022 Charts – Volumes



**CROPEX
INTRADAY
MARKET**

2022 Charts – Prices



* Volume Weighted Average Price for completed trades per product – total sum, calculated as sum of each transaction volume multiplied with corresponding price, divided by the total volume

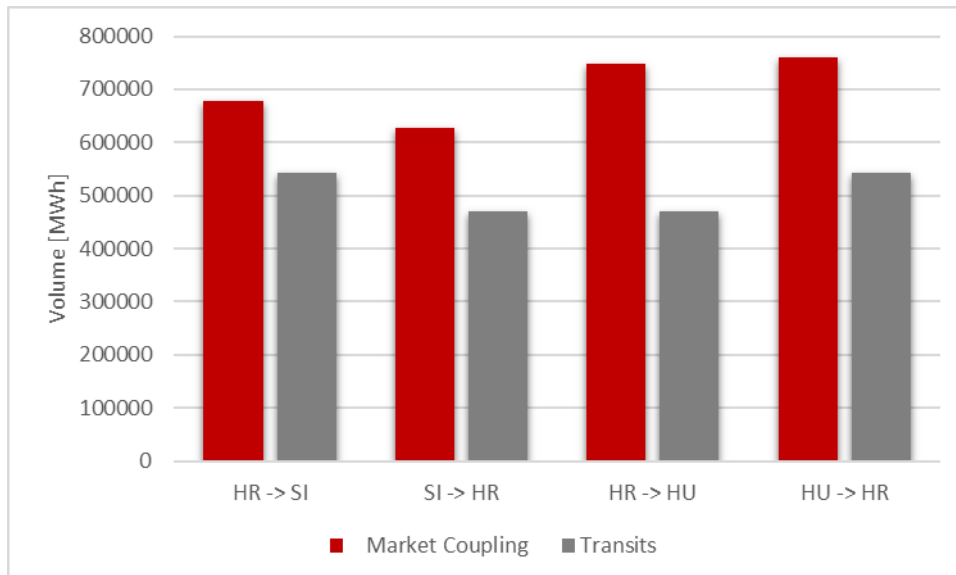
CROPEX INTRADAY MARKET

Market Coupling

Since **2019**, Croatian Intraday Market is coupled to European SIDC market via **Croatian-Slovenian** and **Croatian-Hungarian** borders.

Volume [MWh]	2022
CROPEX Volume Traded	815,576
Market Coupling Total	2,814,240
Market Coupling flow HR -> SI	678,875
Market Coupling flow SI -> HR	626,838
Market Coupling flow HR -> HU	748,973
Market Coupling flow HU -> HR	759,554
Transit Total Volume	1,011,345
Transit HR -> SI	542,324
Transit SI -> HR	469,021
Transit HR -> HU	469,021
Transit HU -> HR	542,324

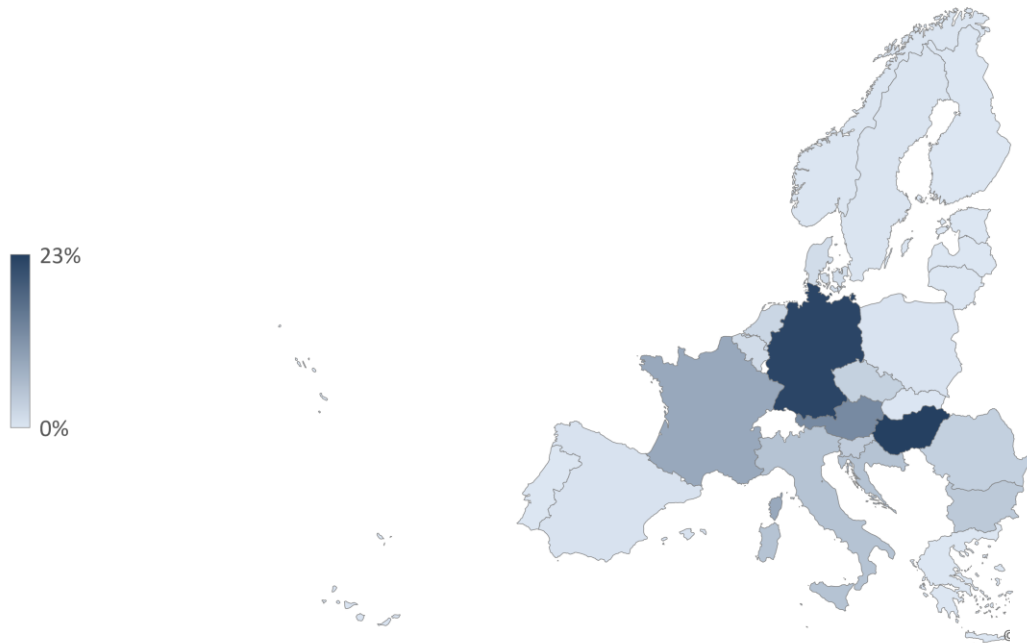
Market Coupling Volume – Transit Volumes



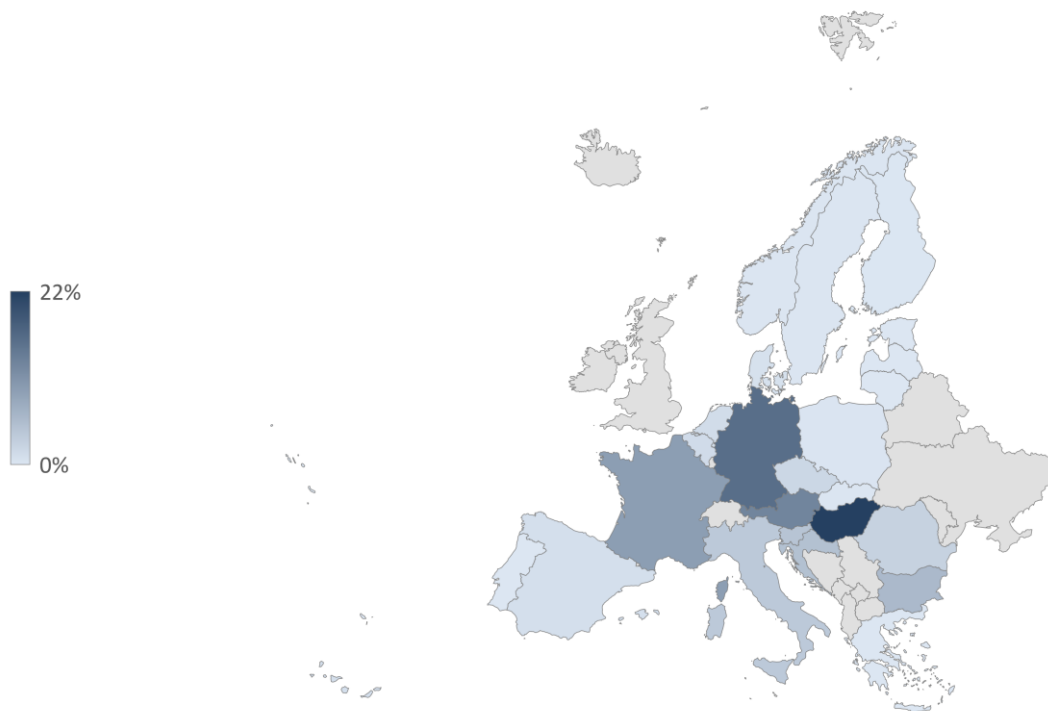
CROPEX INTRADAY MARKET

2022 Map of countries where CROPEX Intraday members sold or bought energy

Map of countries where CROPEX Intraday members sold energy



Map of countries where CROPEX Intraday members bought energy



Chapter 4

AUCTIONS

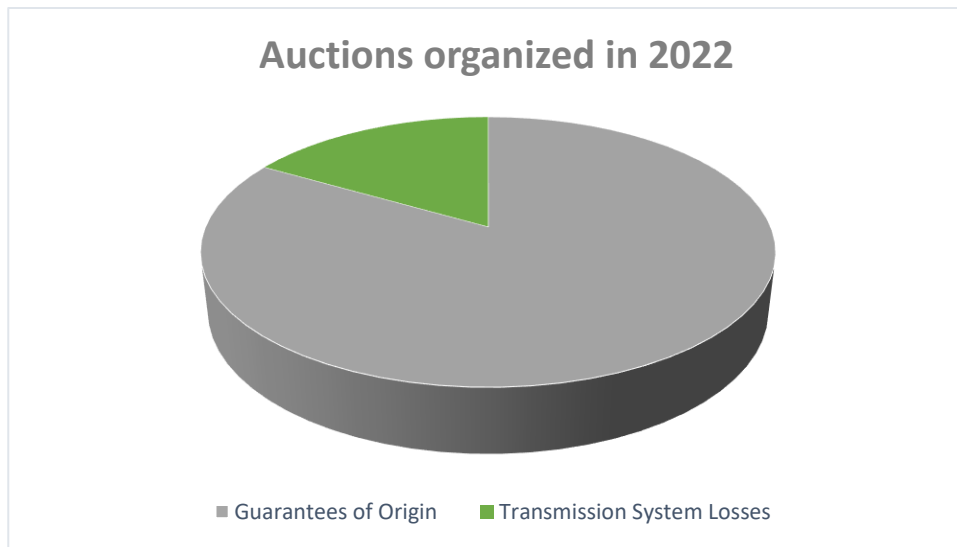
General 2022 - Data

During 2022 altogether **18** different auctions were organized by CROPEX.

Most of the auctions (**15**) were held for the purpose of selling **Guarantees of Origin (GO)** on behalf of Croatian Energy Market Operator (HROTE).

For Croatian Transmission System Operator (HOPS), **3** auctions were organized by CROPEX for the purpose of procurement of energy for covering losses in the Croatian transmission system.

Auction Type	Number of Auctions	Number of Participants
Guarantees of Origin	15	30
Transmission System Losses	3	4
































AUCTIONS

Guarantees of Origin Auctions

During 2022 three new auction participants joined Guarantees of Origin (GO) auctions organized by CROPEX. 100% of offered Guarantees of Origin at auctions were successfully sold in the amount of **1,494,833** Guarantees of Origin. By the end of 2022, there were altogether **30** registered auction participants.

List of CROPEX auction participants (end of 2022)

				Joined 2022
1	ACT Commodities B.V.		NL	
2	AFS Energy B.V.		NL	
3	AITHER GROUP SA		CH	✓
4	BELEKTRON EKOTRADING d.o.o.		SI	
5	BKW Energie AG		CH	
6	Caely Renewables B.V.		NL	✓
7	Centrica Energy Limited		UK	
8	ČEZ, a.s.		CZ	
9	Danske Commodities		DK	
10	DXT Commoditeies SA		CH	
11	EDS International SK, s.r.o.		SK	
12	E.ON ENERGIJA d.o.o.		HR	
13	ENEL Global Trading		IT	
14	Energi Danmark A/S		DK	
15	Energy Delivery Solutions D.O.O. Beograd		RS	
16	Energy Supply EOOD		BG	
17	GEN-I Zagreb d.o.o.		HR	
18	GO2-markets GmbH		DE	
19	HRVATSKA ELEKTROPRIVREDA d.d.		HR	
20	Croatian Transmission System Operator Ltd.		HR	
21	NVALUE AG		CH	
22	Opti-Ment BV		BE	
23	Naturgy Commodities Trading SA		ES	✓
24	PETROL d.o.o.		HR	
25	Respect Energy S.A.		PL	
26	RIGHT POWER, a.s.		SK	
27	SCB Broker SA		CH	
28	Statkraft Markets GmbH		DE	
29	STX Commodities		NL	
30	TERREMOTO ENERGO-PROJEKT d.o.o.		HR	

AUCTIONS

List of 2022 GOs auctions

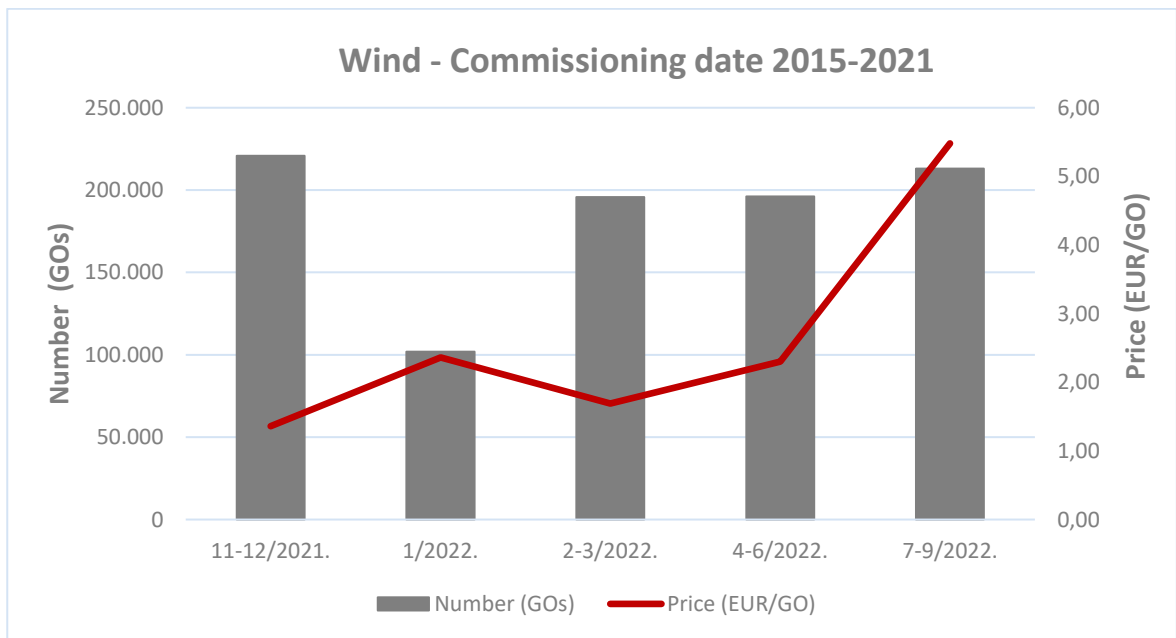
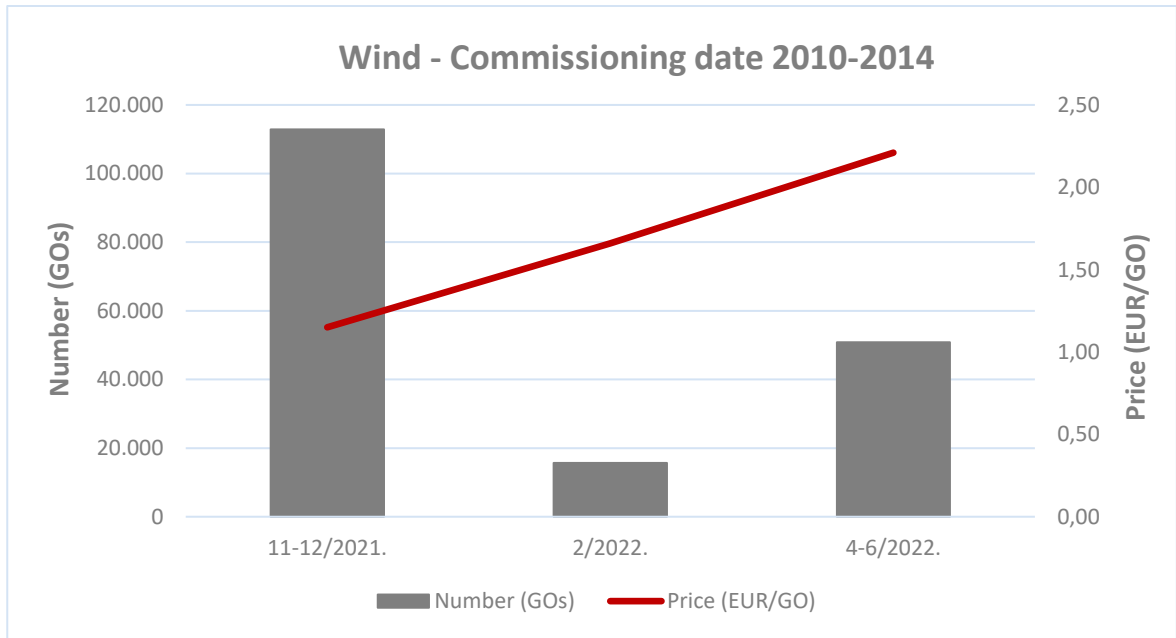
From **15** GO auctions organized during 2022, 8 auctions were held for production from the **Wind** power plant, while on 7 auctions HROTE sold GOs from **Biomass** power plants.

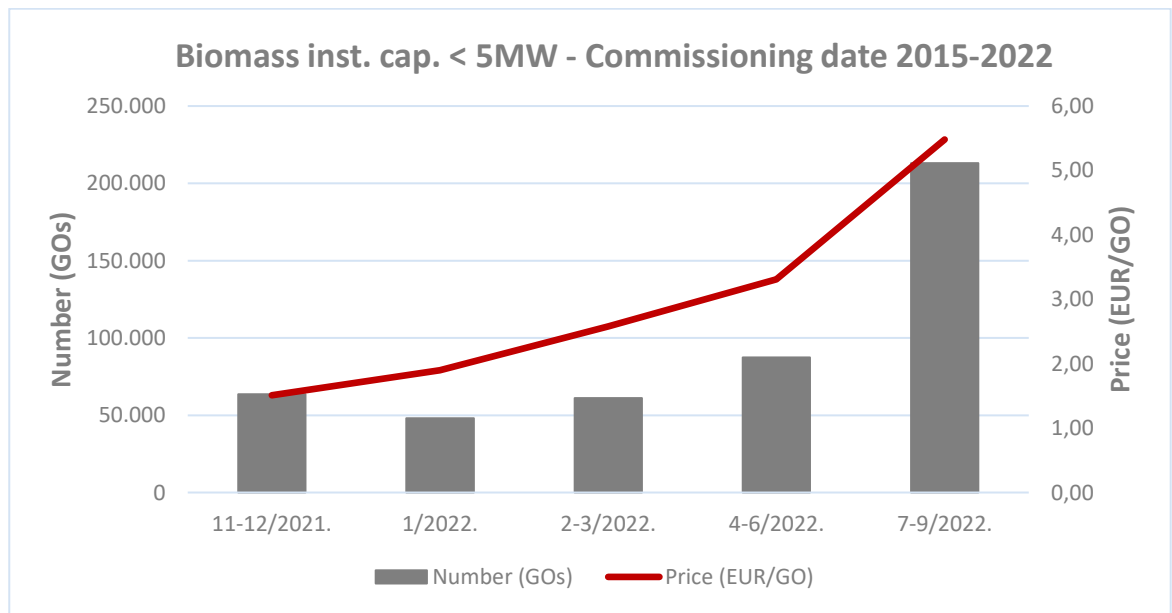
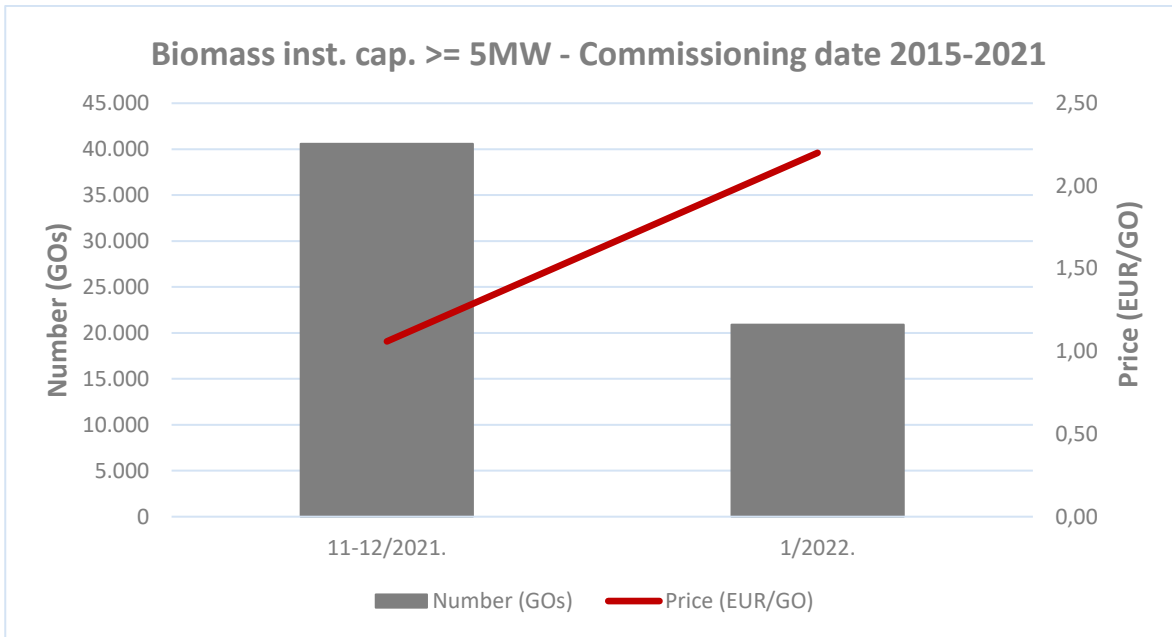
Wind GO auctions were split depending on the commissioning date of the power plants, while an additional split was done for GOs from biomass, depending on the installed capacity of the power plants.

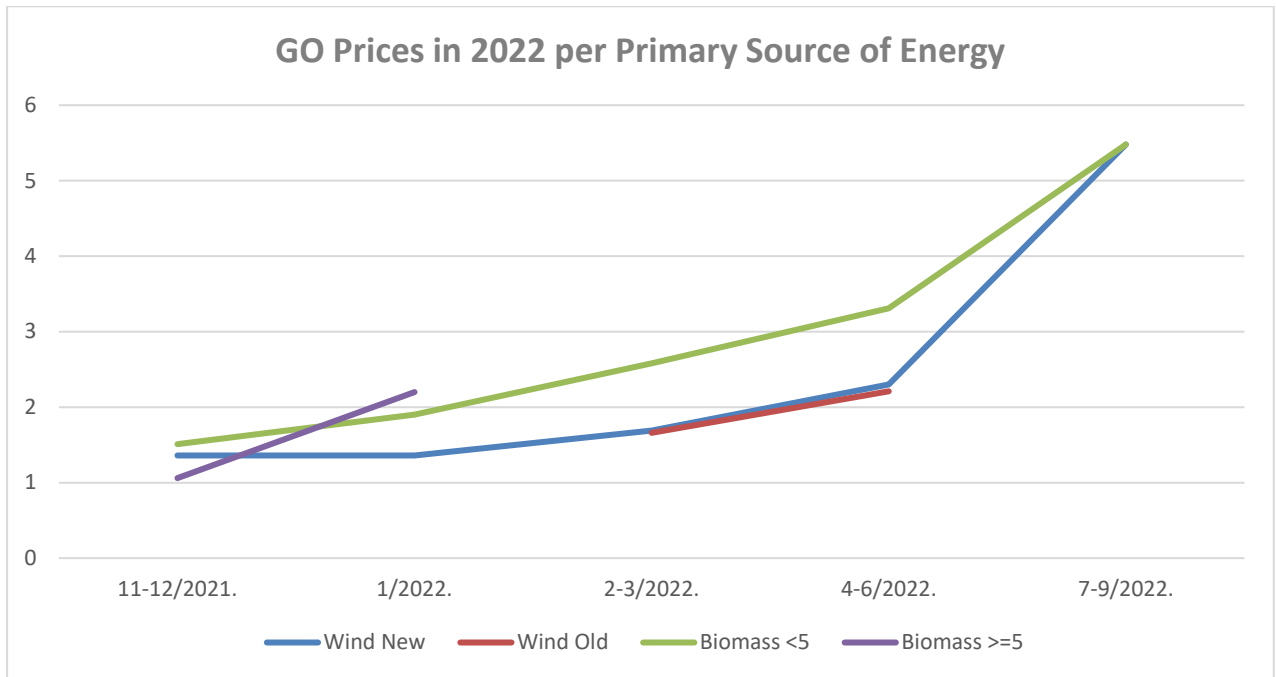
List of auctions in 2022	Auction type	Auction date	GOs sold	Price EUR/GO
Production 01/11/2021-31/12/2021 (Comm. date 06-2015 To 12-2020) - inst. cap. less than 5 MW	BIOMASS	2022-02-21	63,603	1.51
Production 01/11/2021-31/12/2021 (Comm. date 12-2015 To 07-2021) - inst. cap. 5 MW and more	BIOMASS	2022-02-21	40,594	1.06
Production 01/11/2021-31/12/2021 (Comm. date 02-2012 To 12-2014)	WIND	2022-02-21	112,827	1.15
Production 01/11/2021-31/12/2021 (Comm. date 12-2015 To 05-2020)	WIND	2022-02-21	220,872	1.36
Production 01/01/2022-31/01/2022 (Comm. date 06-2015 To 12-2020) - inst. cap. less than 5 MW	BIOMASS	2022-02-21	32,721	2.35
Production 01/01/2022-31/01/2022 (Comm. date 12-2015 To 07-2021) - inst. cap. 5 MW and more	BIOMASS	2022-02-21	20,912	2.2
Production 01/01/2022-31/01/2022 (Comm. date 12-2015 To 05-2020)	WIND	2022-02-21	101,823	2.36
Production 01/02/2022-31/03/2022 (Comm. date 12-2015 To 05-2020)	WIND	2022-04-22	195,840	1.69
Production 01/02/2022-28/02/2022 (Comm. date 08-2013 To 12-2014)	WIND	2022-04-22	15,678	1.66
Production 01/02/2022-31/03/2022 (Comm. date 06-2015 To 03-2022) - inst. cap. less than 5 MW	BIOMASS	2022-04-22	61,137	2.58
Production 01/04/2022-30/06/2022 (Comm. date 06-2015 To 03-2022) - inst. cap. less than 5 MW	BIOMASS	2022-07-25	87,301	3.31
Production 01/04/2022-30/06/2022 (Comm. date 12-2015 To 05-2020)	WIND	2022-07-25	196,068	2.3
Production 01/04/2022-30/06/2022 (Comm. date 02-2012 To 12-2014)	WIND	2022-07-25	50,810	2.21
Production 01/07/2022-30/09/2022 (Comm. date 12-2014 To 05-2020)	WIND	2022-10-25	212,987	5.48
Production 01/07/2022-30/09/2022 (Comm. date 06-2015 To 03-2022) - inst. cap. less than 5 MW	BIOMASS	2022-10-25	81,660	5.7

AUCTIONS

Guarantees of Origin – 2022 Charts







*The charts show GOs Marginal Price (EUR/GO)

AUCTIONS

Losses Auctions

By the end of 2022 CROPEX also organized **three** auctions in which 4 different registered auction participants were selling energy to HOPS for the purpose of covering losses in Croatian transmission system operated by HOPS.

Losses Auctions

List of auctions	Auction date	Number of participants	Power bought MWh/h
Energy delivery to cover transmission system losses in 2023	2022-03-29	4	5
Energy delivery to cover transmission system losses in 2024	2022-03-29	4	5
Energy delivery to cover transmission system losses in 2025	2022-03-29	4	5

CONTACT

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Silvio Brkić – President of the Board

Ivica Toljan – Member of the Board