

2021

Annual Report



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Chapter 1

CROPEX MEMBERS

Additional five new members during 2021

In 2021 five new members joined CROPEX Markets. Companies from Croatia, **ENNA Opskrba d.o.o.** and **IE-ENERGY d.o.o.** joined Day-Ahead and Intraday Market, while **D.TRADING d.o.o.** joined Day-Ahead Market.

Vitol Gas and Power BV from the Netherlands and **ENERGOVIA EOOD** from Bulgaria joined on Day-Ahead Market.

By the end of 2021, there were altogether **27 registered members** active on CROPEX Day Ahead Market, of which 18 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.		UK	✓	
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 TrailStone Renewables GmbH		DE	✓	✓
27 Vitol Gas and Power BV		NL	✓	

Chapter 2

General 2021 trading data

CROPEX DAY-AHEAD MARKET

Total Traded Volume in 2021 was achieved in the range of 2020, with record volumes achieved on a monthly, daily, and hourly basis.

In general, an increase in prices is recorded compared to 2020; both Day Ahead Average Base Price and Average Peak Price.

Volume Traded [MWh]	2021	2020	
Total	5,967,193	6,076,726	1.8 % ↓
Highest Monthly	791,550	599,377	32.1 % ↑
Average Monthly	497,266	506,394	1.8 % ↓
Highest Daily	38,785	28,024	38.4 % ↑
Average Daily	16,348	16,603	1.5 % ↓
Highest Hourly	2,036	1,605	26.9 % ↑
Average Hourly	681	692	1.6 % ↓



Price [EUR/MWh]	2021	2020	
Base Average	114.7	38.03	301.6 % ↑
Peak Average	126.5	42.06	300.8 % ↑
Highest hourly	533.2	172.1	309.8 % ↑
Lowest hourly	-263.3	-23.5	1120.4 % ↓

CROPEX DAY-AHEAD MARKET

General 2021 data – monthly volumes and prices

2021 Volumes [MWh]

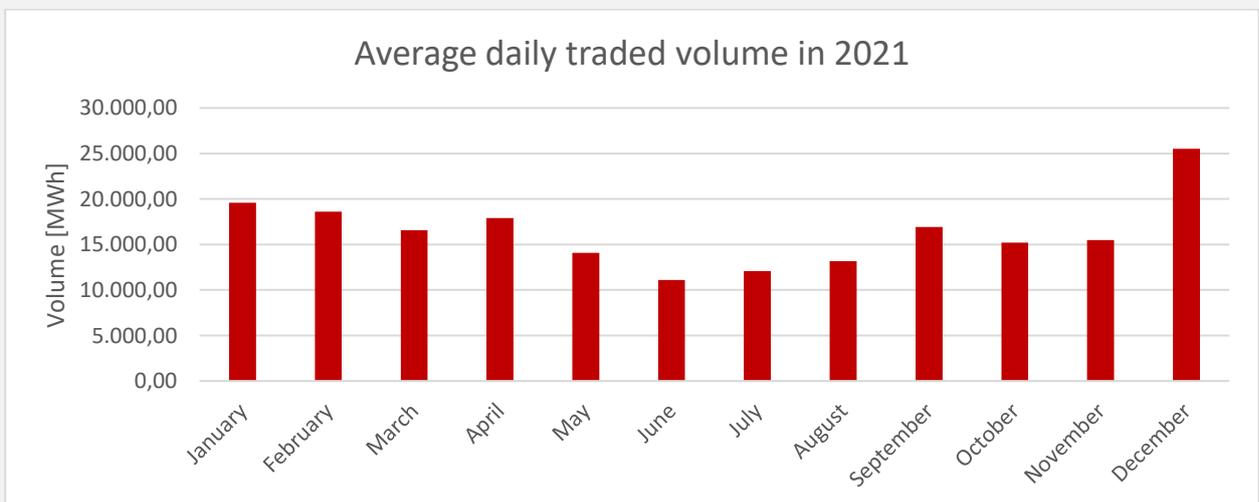
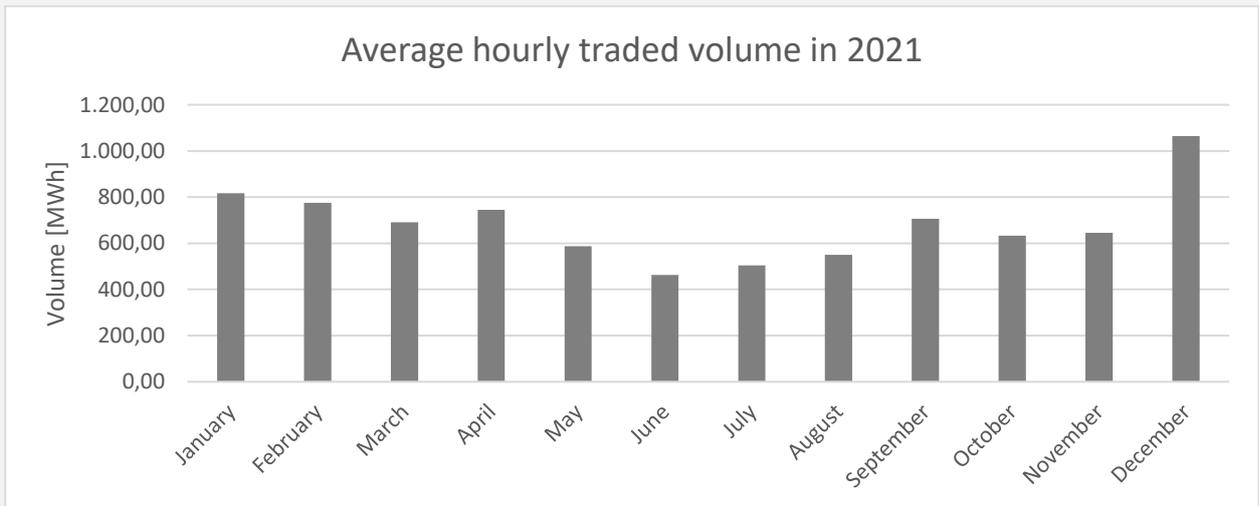
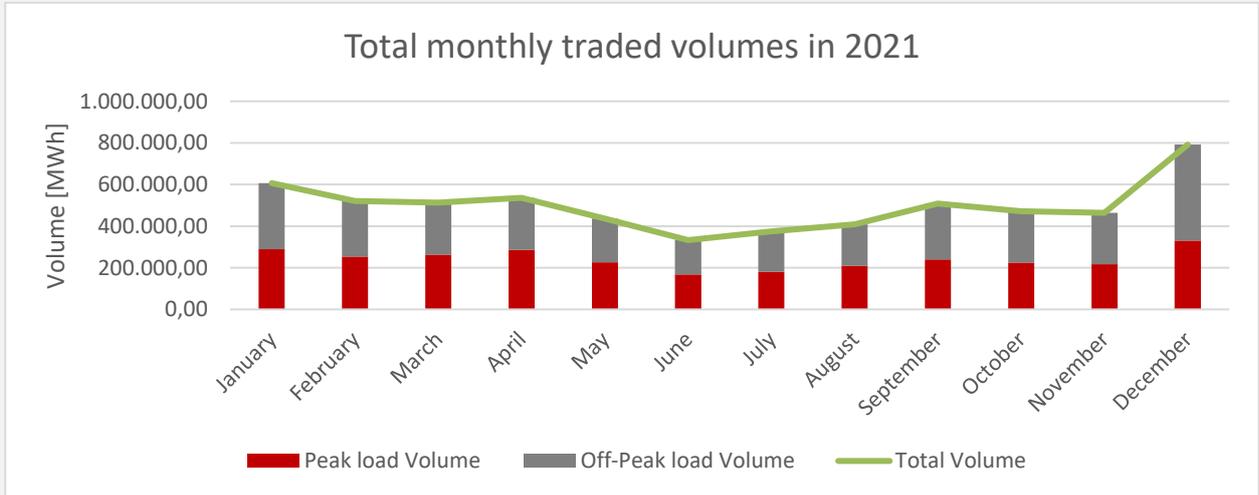
Month	Base Volume	Peak Volume	Off-Peak Volume	Average Daily Traded Volume	Average Hourly Traded Volume
January	607,319.40	288,482.00	318,837.40	19,590.95	816.29
February	521,011.30	253,205.30	267,806.00	18,607.55	775.31
March	513,477.20	263,189.00	250,288.20	16,563.78	691.09
April	536,688.00	286,586.00	250,102.00	17,889.60	745.40
May	436,895.10	226,420.00	210,475.10	14,093.39	587.22
June	332,959.00	168,298.00	164,661.00	11,098.63	462.44
July	374,892.30	180,428.40	194,463.90	12,093.30	503.89
August	408,707.20	209,618.90	199,088.30	13,184.10	549.34
September	507,950.60	239,739.00	268,211.60	16,931.69	705.49
October	471,140.50	225,248.00	245,611.50	15,198.08	632.40
November	464,601.80	217,368.40	247,233.40	15,486.73	645.28
December	791,550.10	330,654.60	460,895.50	25,533.87	1,063.91

2021 Prices [EUR/MWh]

Month	Average Base Load Price	Average Peak Price	Average Off-Peak Price	Hourly Minimum Price	Hourly Maximum Price
January	53.89	63.75	44.02	-263.31	110.45
February	50.37	57.50	43.25	-3.02	117.31
March	55.92	58.39	53.33	19.48	100.87
April	64.47	66.52	62.42	-2.09	125.00
May	59.90	59.09	60.70	-66.18	101.50
June	78.39	80.78	76.01	-36.72	139.07
July	93.77	99.51	88.04	1.04	148.33
August	105.51	115.43	95.60	3.53	232.96
September	138.57	148.10	129.04	60.06	250.00
October	202.54	222.29	182.83	47.94	428.56
November	215.99	246.06	185.91	93.74	421.87
December	251.87	295.23	208.51	35.60	533.19

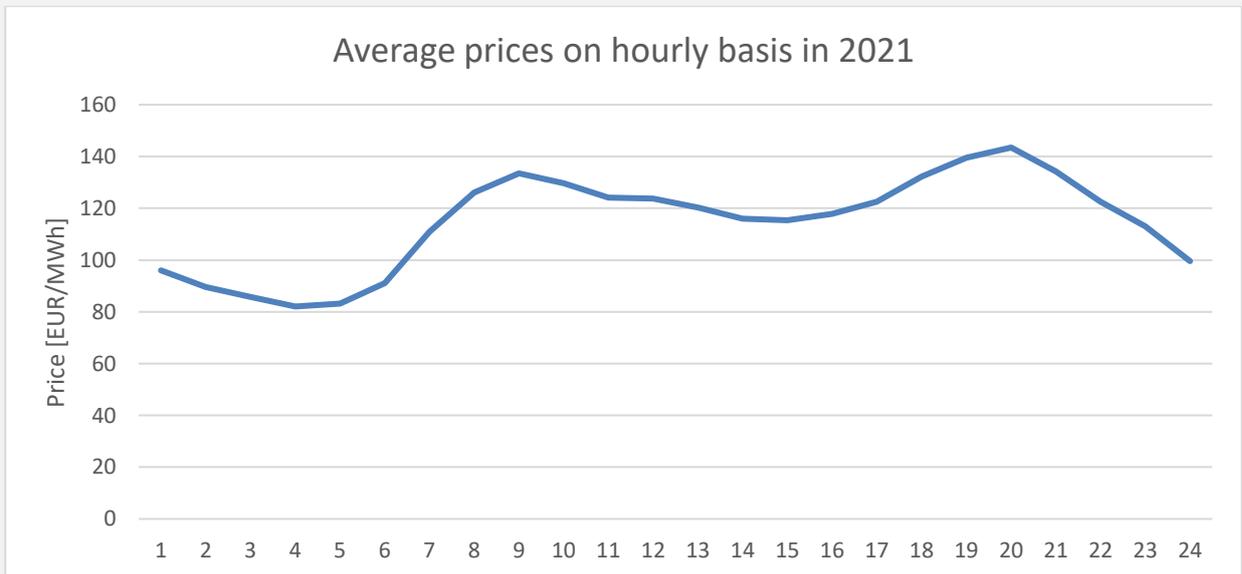
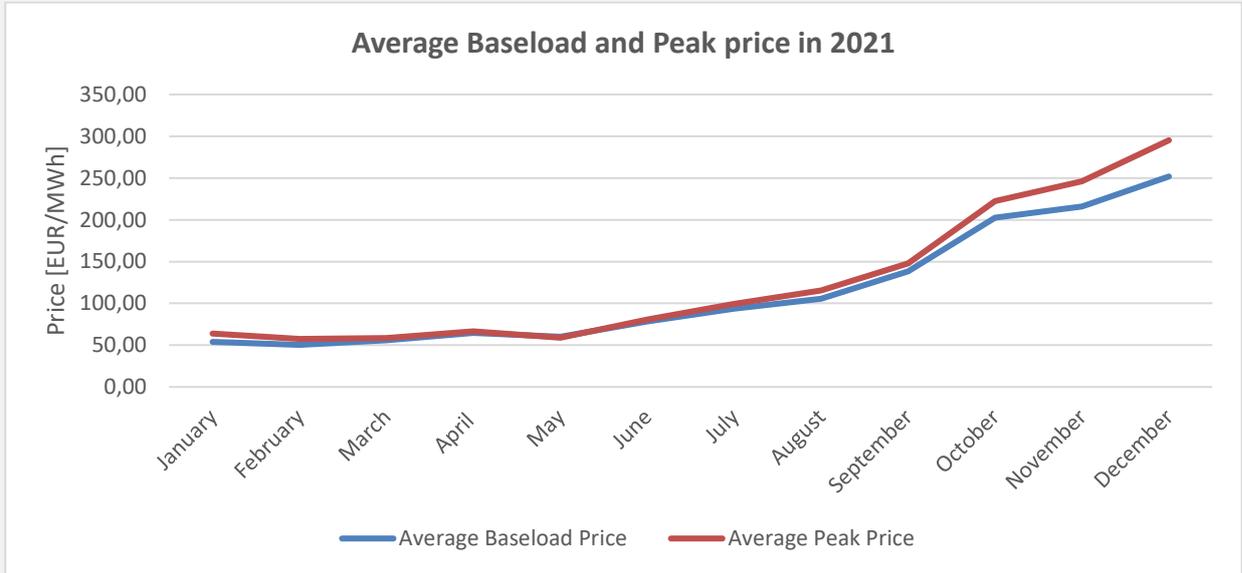
**CROPEX
DAY-AHEAD
MARKET**

2021 charts – Volumes



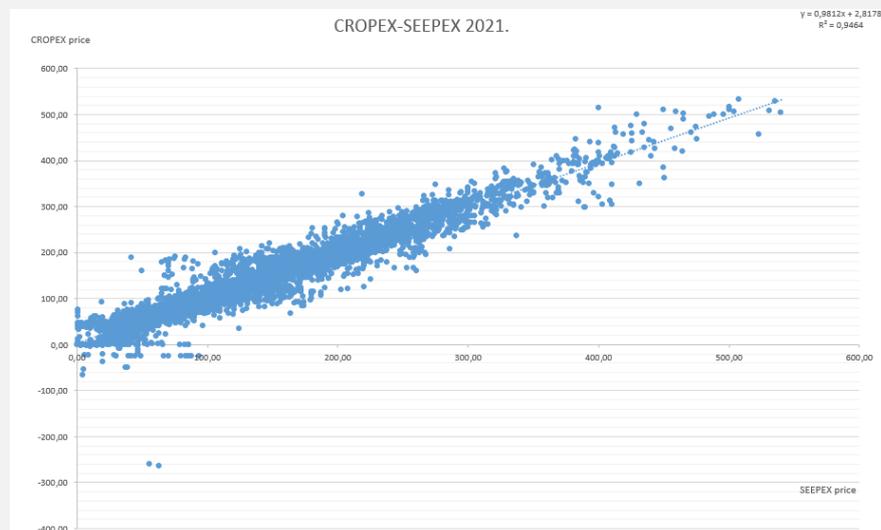
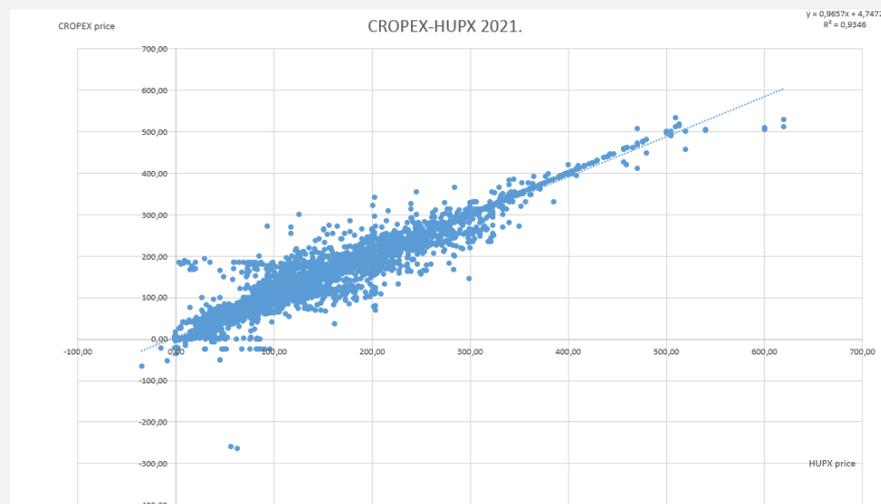
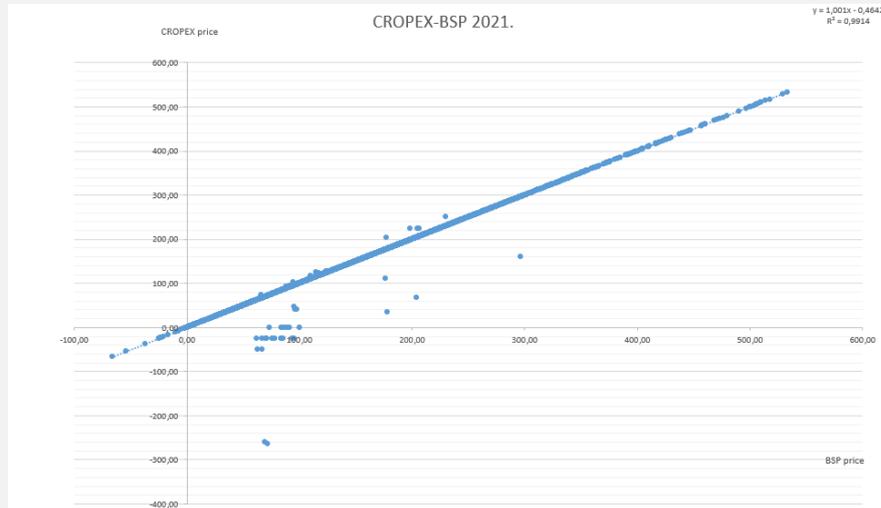
CROPEX DAY-AHEAD MARKET

2021 Data – Prices



CROPEX DAY-AHEAD MARKET

2021 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	918
Sell	1,125
Total	886

According to the HHI analysis CROPEX Day Ahead Market is considered to be 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% indicate that the industry is perfectly competitive and is considered a low concentration.

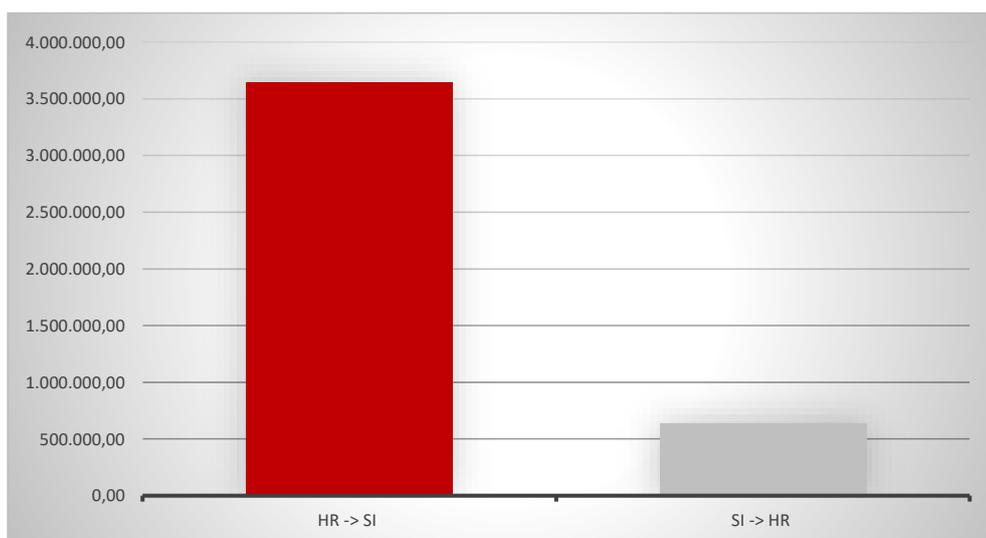
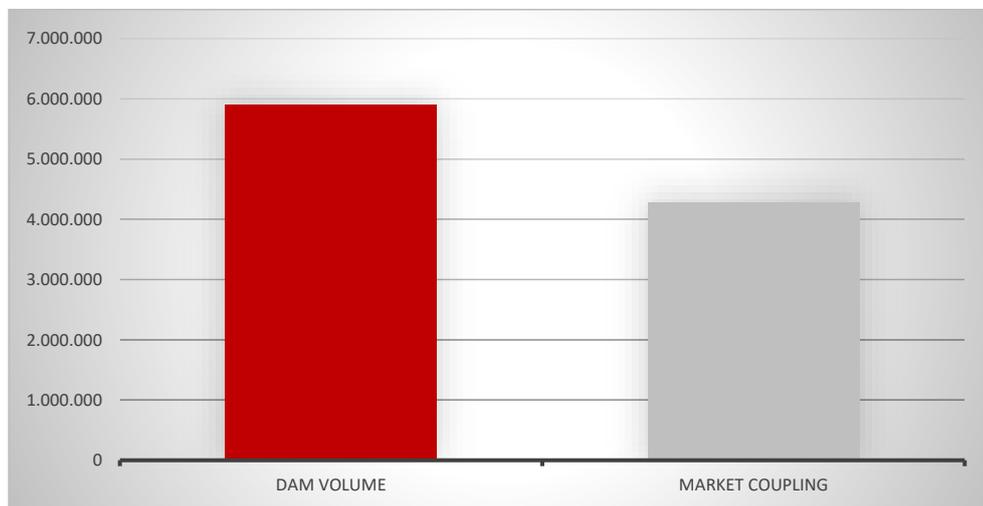
CROPEX DAY-AHEAD MARKET

Market Coupling

Since 2018, Croatian Day Ahead Market is coupled to the European SDAC market via Croatian-Slovenian border.

Volume [MWh]	2021
DAM Volume Traded	5,897,199
Market Coupling Total	4,286,026
Market Coupling HR -> SI flow	3,644,663
Market Coupling SI -> HR flow	641,363

Market Coupling Volume share within DAM Volume Traded



Chapter 3

General 2021 Trading Data

CROPEX INTRADAY MARKET

Following the successful coupling through SIDC in 2019, CROPEX Intraday Market continued with its growth in 2021, with record volumes achieved on a yearly, monthly and daily basis.

Volume Traded [MWh]	2021	2020	
Total	486,980	370,515	31.4 % ↑
Highest Monthly	72,213	49,773	45.1 % ↑
Average Monthly	40,581	30,876	31.4 % ↑
Highest Daily	7,597	6,346	19.7 % ↑
Average Daily	1,334	1,012	31.8 % ↑
Highest Hourly	590	601	1.8 % ↓
Average Hourly	58	49	18.4 % ↑



Price [EUR/MWh]	2021	2020	
Volume Weighted Average Price	115.12	38.30	200.6 % ↑
Highest Trade Price	627.69	214.83	192.2 % ↑
Lowest Trade Price	-37.90	-12.57	201.5 % ↓
Number of Trades	126,703	70,984	78.5 % ↑

CROPEX INTRADAY MARKET

General 2021 Data – Monthly Volumes and Prices

2021 Volumes [MWh]

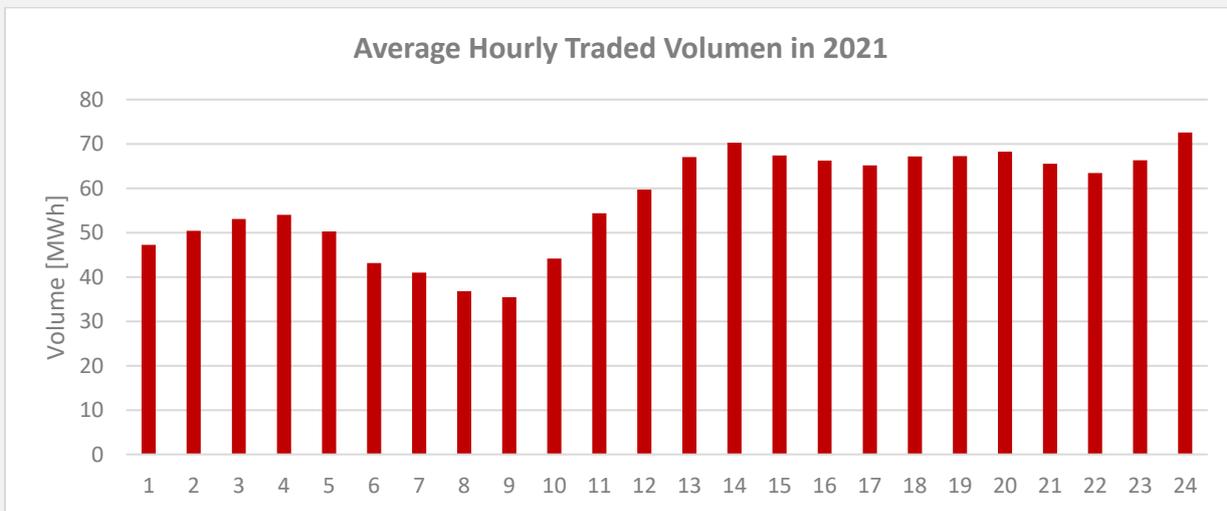
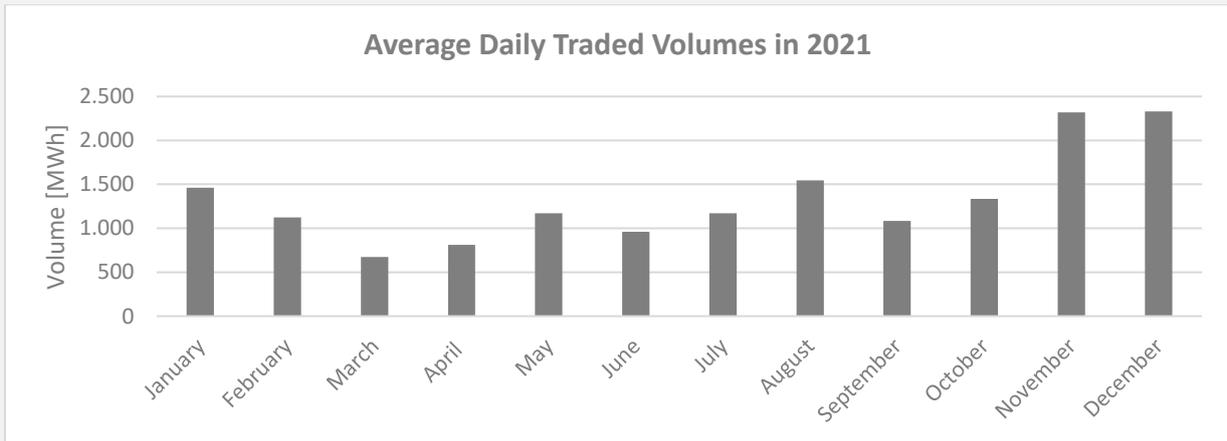
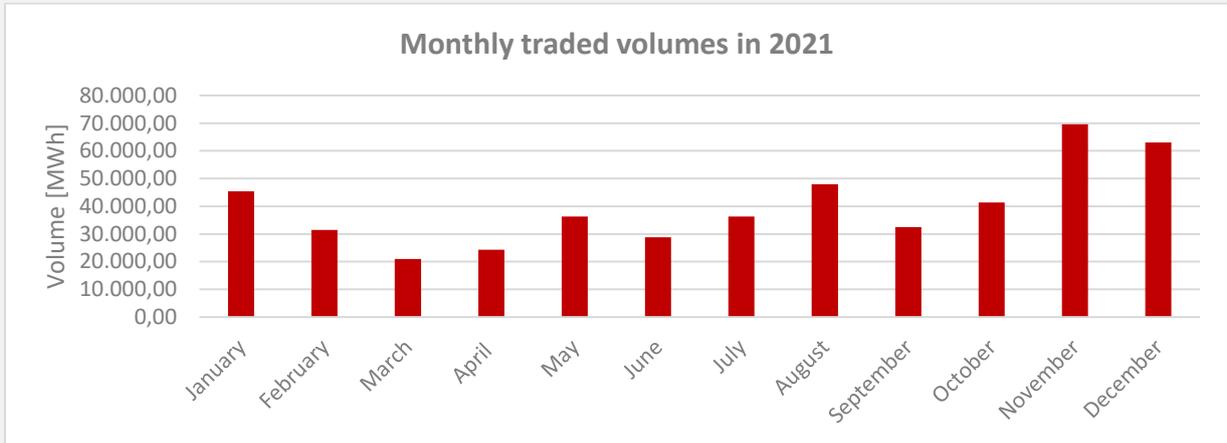
Month	Total Traded Volume	Highest Daily Traded Volume	Average Daily Traded Volume	Highest Hourly Traded Volume	Average Hourly Traded Volume
January	45,364	5,293	1,463	403	68
February	31,507	4,693	1,125	379	54
March	20,936	1,397	675	210	32
April	24,332	1,955	811	197	35
May	36,268	3,431	1,170	342	50
June	28,807	2,595	960	344	41
July	36,277	2,411	1,170	203	49
August	47,884	5,276	1,545	474	65
September	32,481	2,934	1,083	404	46
October	41,339	3,140	1,334	325	56
November	69,573	6,837	2,319	590	97
December	72,213	7,597	2,329	540	101

2021 Prices [EUR/MWh]

Month	Weighted Average Price	Peak Weighted Average Price	Off-Peak Weighted Average Price	Lowest Trade Price	Highest Trade Price
January	53.56	62.45	44.93	-5	150
February	49.02	55.89	40.70	-10	140
March	55.04	57.46	52.73	7	130.2
April	63.65	64.96	62.26	-10	170
May	60.09	60.31	59.76	-50	122
June	80.54	82.98	77.47	-10	298
July	94.15	100.07	88.20	20.61	330
August	104.35	112.17	96.51	9.38	292.2
September	135.48	144.14	126.47	12	300
October	195.47	215.68	175.61	33	437.4
November	214.46	248.07	180.34	1	598.4
December	266.71	292.42	199.60	3.4	688.5

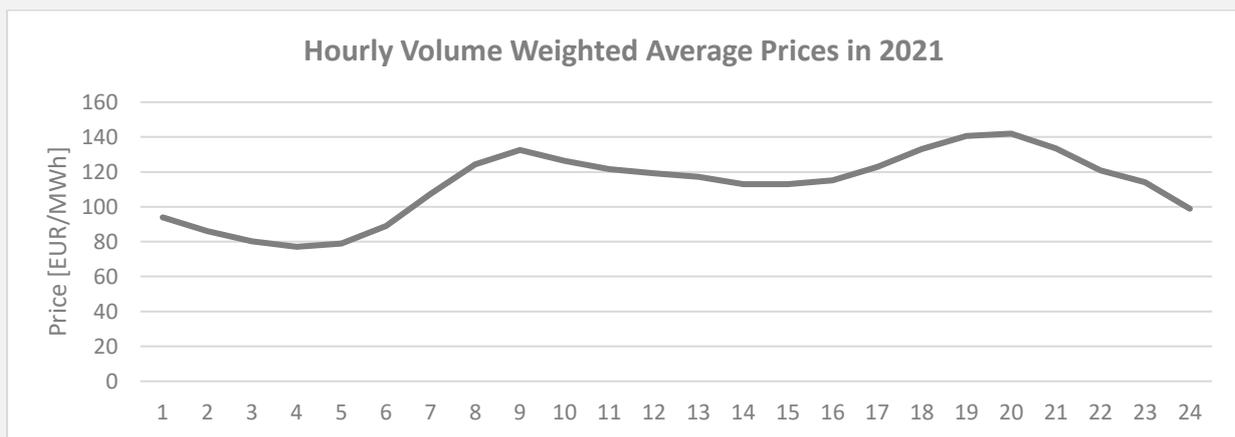
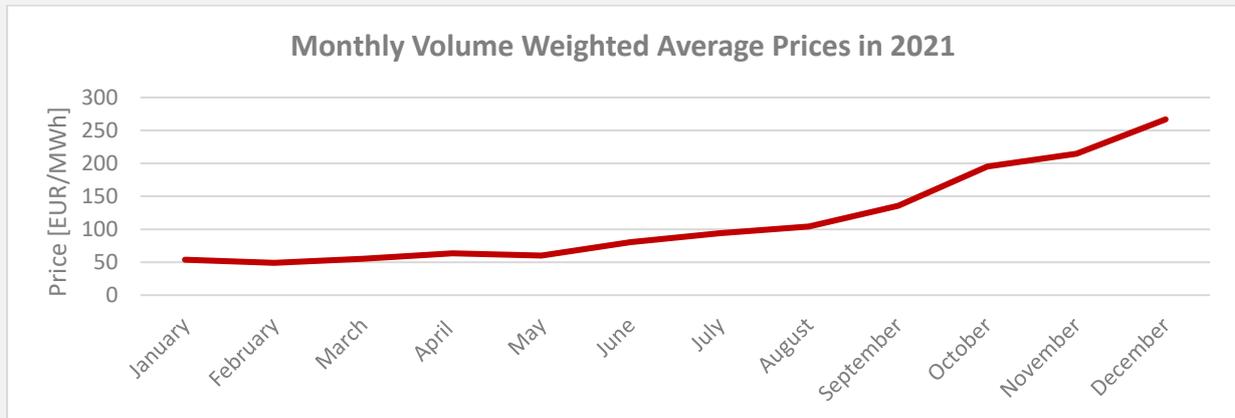
**CROPEX
INTRADAY
MARKET**

2021 Charts – Volumes



CROPEX INTRADAY MARKET

2021 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*

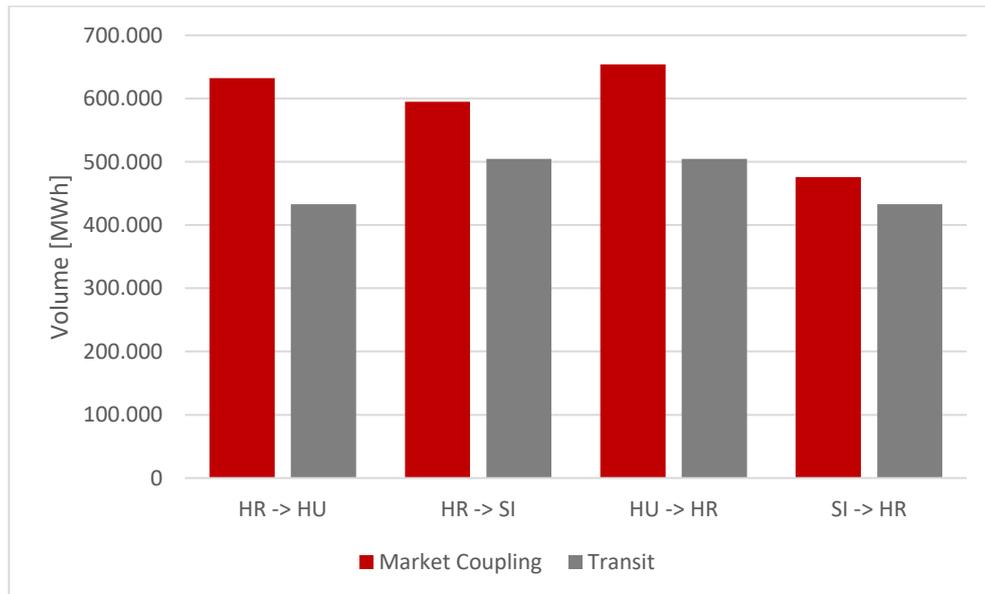
CROPEX INTRADAY MARKET

Market Coupling

Since 2018, Croatian Intraday Market is coupled to European SIDC market via Croatian-Slovenian and Croatian-Hungarian borders.

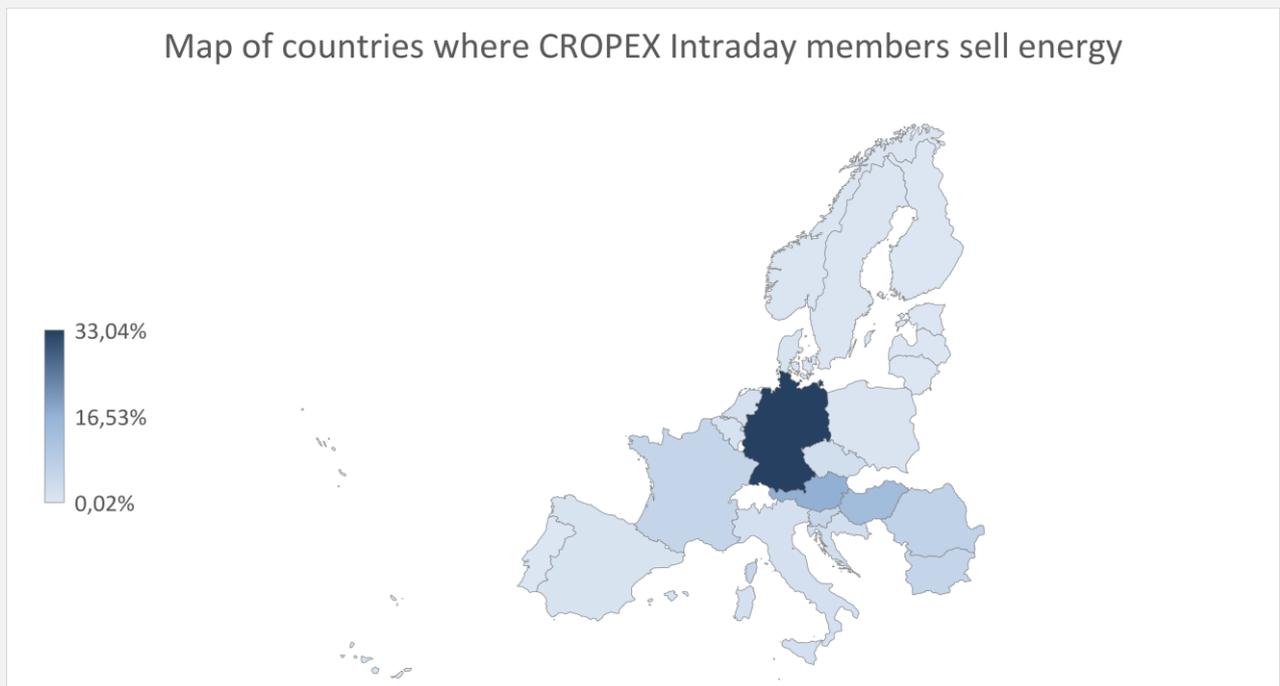
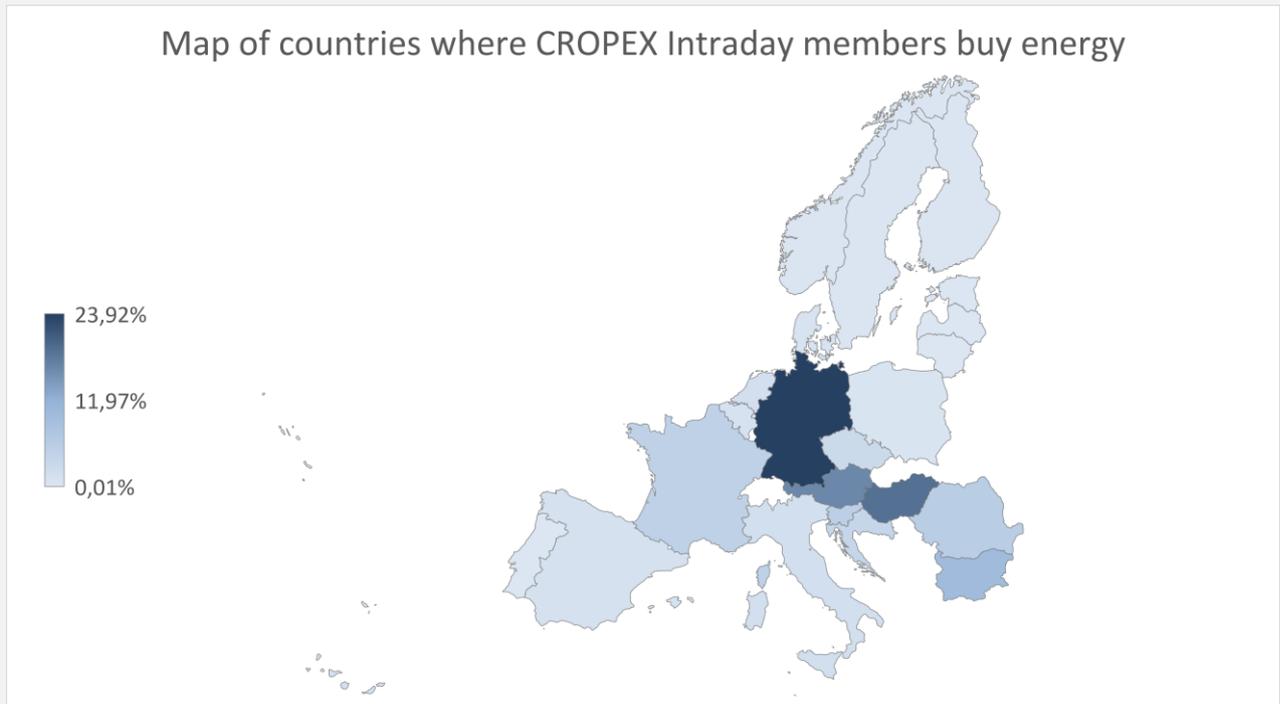
Volume [MWh]	2021
CROPEX Volume Traded	486,980
Market Coupling Total	2,356,983
Market Coupling HR -> SI flow	594,732
Market Coupling SI -> HR flow	476,018
Market Coupling HR -> HU flow	632,121
Market Coupling HU -> HR flow	654,111
Transit Total Volume	937,971
Market Coupling HR -> SI flow	504,374
Market Coupling SI -> HR flow	433,097
Market Coupling HR -> HU flow	433,097
Market Coupling HU -> HR flow	504,374

Market Coupling Volume – Transit Volumes



CROPEX INTRADAY MARKET

2021 Map of countries where CROPEX Intraday members buy or sell energy



Chapter 4

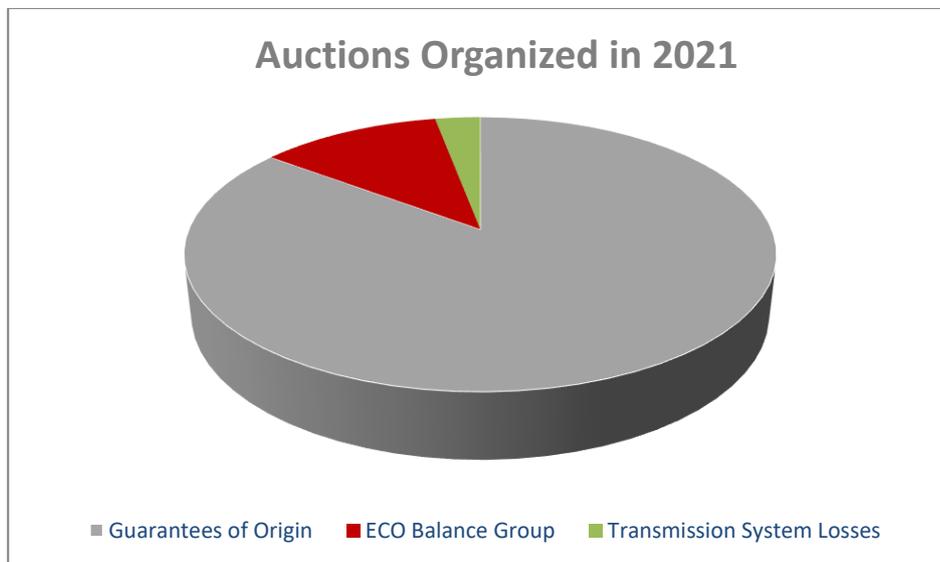
General 2021 Data

AUCTIONS

During 2021 altogether 34 different auctions were organized by CROPEX. Most of the auctions (29) were held for the purpose of selling Guarantees of Origin (GO) on behalf of Croatian Energy Market Operator (HROTE), with additional 4 auctions for selling RES energy from ECO Balance Group (HROTE).

For Croatian Transmission System Operator (HOPS), 1 auction was 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	29	27
ECO Balance Group	4	10
Transmission System Losses	1	4



AUCTIONS

Guarantees of Origin Auctions

During 2021 seven new auction participants joined Guarantees of Origin auctions organized by CROPEX. 100% of offered Guarantees of Origin at auctions were successfully sold in the amount of **2,033,177** Guarantees of Origin.

By the end of 2021, there were altogether 27 registered CROPEX auction participants.

List of auction participants (end of 2021)

			Joined 2021	
1	ACT Commodities B.V.		NL	
2	AFS Energy B.V.		NL	
3	BELEKTRON EKOTRADING d.o.o.		SI	
4	BKW Energie AG		CH	✓
5	Centrica Energy Limited		UK	✓
6	ČEZ, a.s.		CZ	
7	Danske Commodities		DK	
8	DXT Commoditeies SA		CH	
9	EDS International SK, s.r.o.		SK	✓
10	E.ON ENERGIJA d.o.o.		HR	
11	ENEL Global Trading		IT	
12	Energi Danmark A/S		DK	
13	Energy Delivery Solutions D.O.O. Beograd		RS	✓
14	Energy Supply EOOD		BG	
15	GEN-I Zagreb d.o.o.		HR	
16	GO2-markets GmbH		DE	✓
17	HRVATSKA ELEKTROPRIVREDA d.d.		HR	
18	Croatian Transmission System Operator Ltd.		HR	
19	NVALUE AG		CH	
20	Opti-Ment BV		BE	✓
21	PETROL d.o.o.		HR	
22	Respect Energy S.A.		PL	✓
23	RIGHT POWER, a.s.		SK	
24	SCB Broker SA		CH	
25	Statkraft Markets GmbH		DE	
26	STX Commodities		NL	
27	TERREMOTO ENERGO-PROJEKT d.o.o.		HR	

AUCTIONS

List of 2021 GOs auctions

From 29 GO auctions organized during 2021, 14 auctions were held for production from the wind power plant, while on 15 auctions HROTE sold GOs from Biomass power plants.

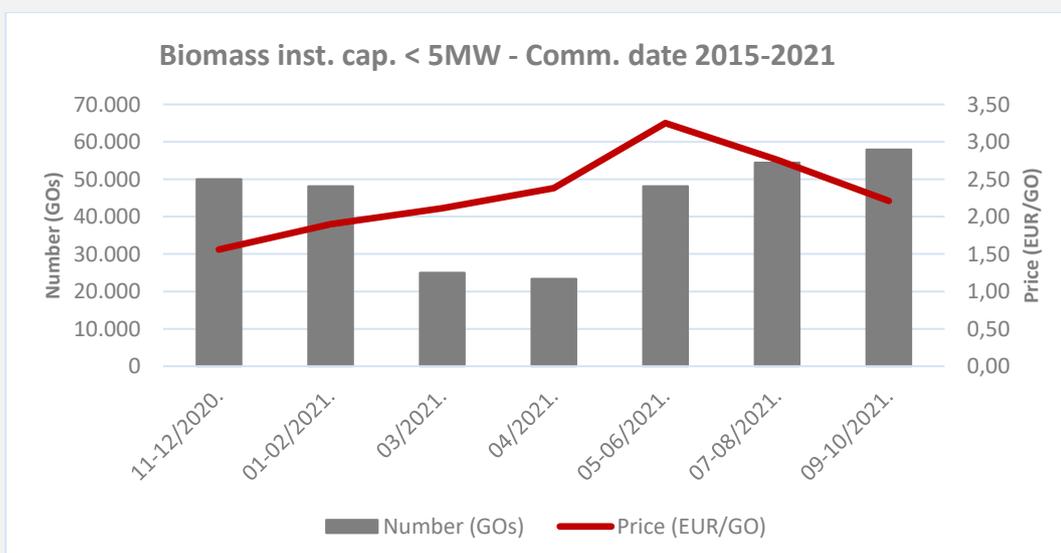
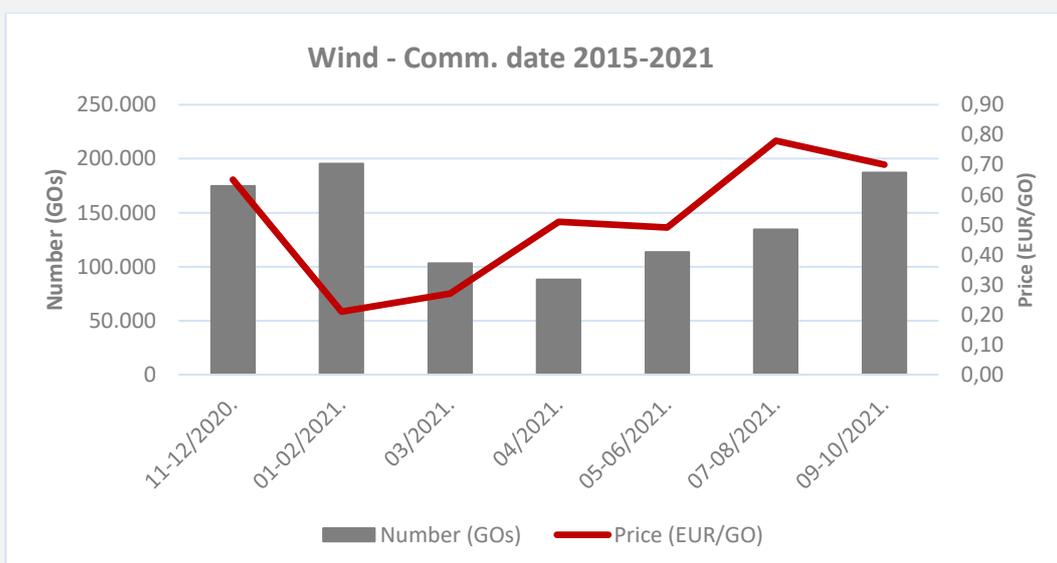
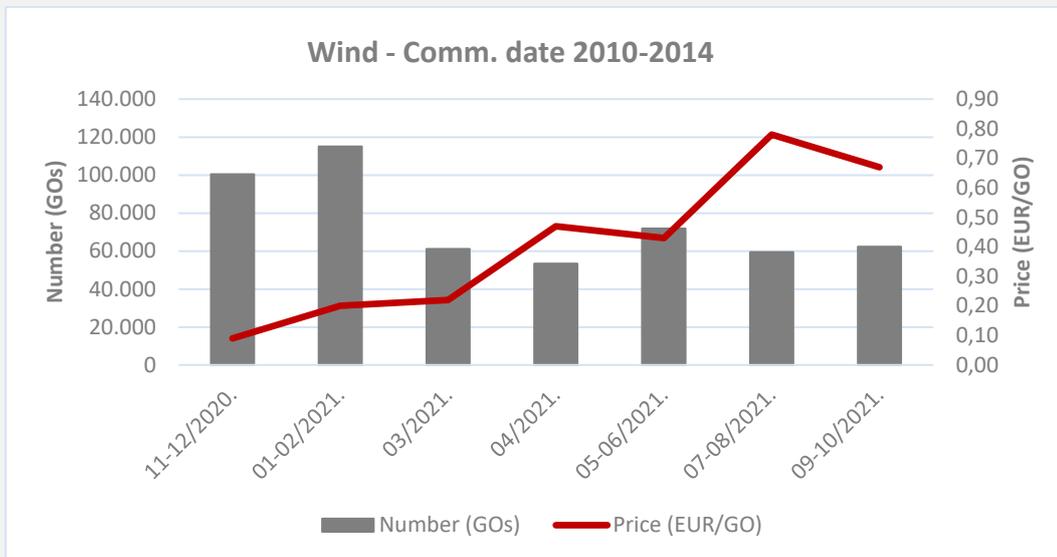
Wind GO auctions were split depending on the commissioning date of the power plants, while an additional split was done for GOs from biomass, depending on the installed capacity of the power plants.

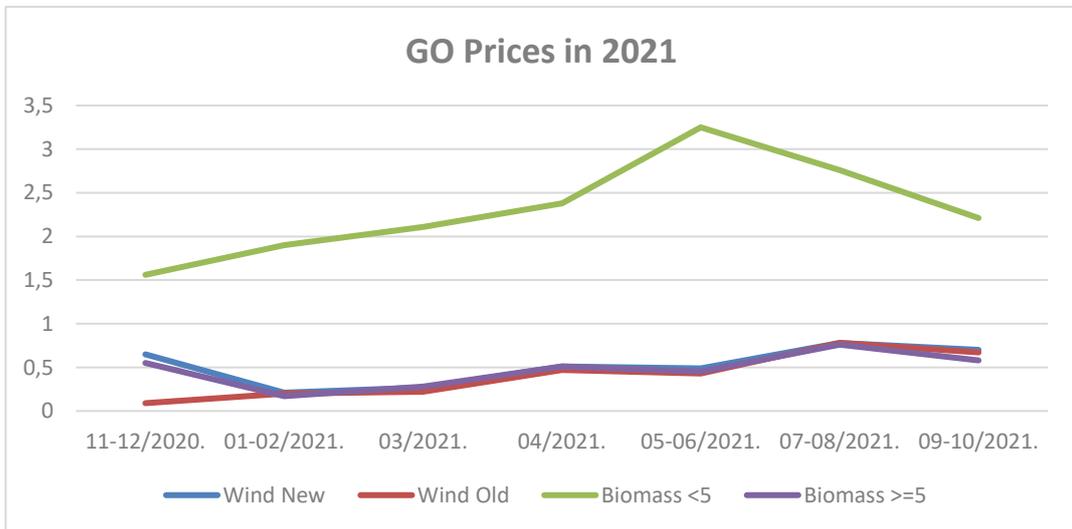
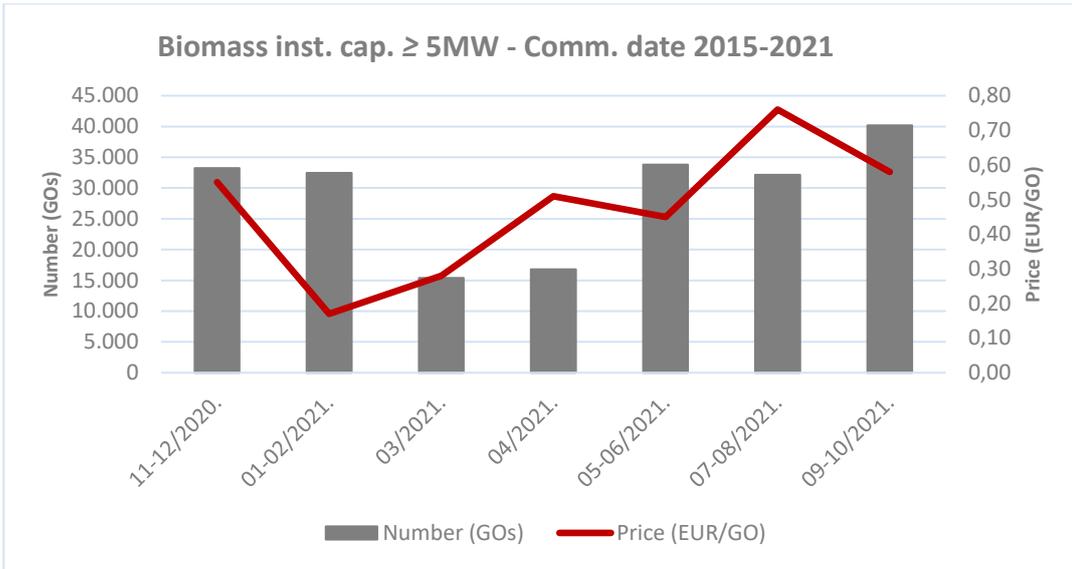
List of auctions in 2021	Auction type	Auction date	GOs sold	Price EUR/GO
Production H1/2020 (Comm. date 09-2011 to 05-2014)	BIOMASS	2021-01-21	2,574	0.25
Production November-December 2020 (Comm. date 06-2015 to 08-2020) - inst. cap. < 5 MW	BIOMASS	2021-01-21	50,012	1.56
Production November-December 2020 (Comm. date 12-2015 to 09-2020) - inst. cap. ≥ 5 MW	BIOMASS	2021-01-21	33,244	0.55
Production November-December 2020 (Comm. date 12-2015 to 05-2020)	WIND	2021-01-21	174,625	0.65
Production November-December 2020 (Comm. date 12-2010 to 12-2014)	WIND	2021-01-21	100,495	0.09
Production January-February 2021 (Comm. date 06-2015 to 08-2020) - inst. cap. < 5 MW	BIOMASS	2021-03-19	48,108	1.90
Production January-February 2021 (Comm. date 12-2015 to 09-2020) - inst. cap. ≥ 5 MW	BIOMASS	2021-03-19	32,444	0.17
Production January-February 2021 (Comm. date 12-2015 to 05-2020)	WIND	2021-03-19	195,330	0.21
Production January-February 2021 (Comm. date 12-2010 to 12-2014)	WIND	2021-03-19	115,080	0.20
Production March 2021 (Comm. date 06-2015 to 08-2020) - inst. cap. < 5 MW	BIOMASS	2021-04-21	24,961	2.11
Production March 2021 (Comm. date 12-2015 to 09-2020) - inst. cap. ≥ 5 MW	BIOMASS	2021-04-21	15,400	0.28
Production March 2021 (Comm. date 12-2015 to 05-2020)	WIND	2021-04-21	103,100	0.27
Production March 2021 (Comm. date 08-2011 to 12-2014)	WIND	2021-04-21	61,091	0.22
Production April 2021 (Comm. date 06-2015 to 08-2020) - inst. cap. < 5 MW	BIOMASS	2021-05-19	23,394	2.38
Production April 2021 (Comm. date 12-2015 to 09-2020) - inst. cap. ≥ 5 MW	BIOMASS	2021-05-19	16,771	0.51
Production April 2021 (Comm. date 12-2015 to 05-2020)	WIND	2021-05-19	88,006	0.51
Production April 2021 (Comm. date 01-2012 to 12-2014)	WIND	2021-05-19	53,377	0.47
Production May and June 2021 (Comm. date 06-2015 to 05-2021) - inst. cap. < 5 MW	BIOMASS	2021-07-22	48,103	3.25
Production May and June 2021	BIOMASS	2021-07-22	33,796	0.45

<i>(Comm. date 12-2015 to 09-2020) - inst. cap. ≥ 5 MW</i>				
Production May and June 2021 <i>(Comm. date 12-2015 to 05-2020)</i>	WIND	2021-07-22	113,363	0.49
Production May and June 2021 <i>(Comm. date 12-2010 to 12-2014)</i>	WIND	2021-07-22	71,789	0.43
Production July and August 2021 <i>(Comm. date 06-2015 to 05-2021) - inst. cap. < 5 MW</i>	BIOMASS	2021-09-22	54,405	2.76
Production July and August 2021 <i>(Comm. date 12-2015 to 07-2021) - inst. cap. ≥ 5 MW</i>	BIOMASS	2021-09-22	32,160	0.76
Production July and August 2021 <i>(Comm. date 12-2015 to 05-2020)</i>	WIND	2021-09-22	134,540	0.78
Production July and August 2021 <i>(Comm. date 02-2012 to 12-2014)</i>	WIND	2021-09-22	59,406	0.78
Production September and October 2021 <i>(Comm. date 06-2015 to 05-2021) - inst. cap. < 5 MW</i>	BIOMASS	2021-11-23	57,958	2.21
Production September and October 2021 <i>(Comm. date 12-2015 to 07-2021) - inst. cap. ≥ 5 MW</i>	BIOMASS	2021-11-23	40,160	0.58
Production September and October 2021 <i>(Comm. date 12-2015 to 05-2020)</i>	WIND	2021-11-23	187,222	0.70
Production September and October 2021 <i>(Comm. date 02-2012 to 12-2014)</i>	WIND	2021-11-23	62,263	0.67

AUCTIONS

Guarantees of Origin – 2021 Charts





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

AUCTIONS

ECO Balance Group and Losses Auctions

During 2021 CROPEX organized 4 different auctions for HROTE where RES energy was being sold on a yearly and quarterly basis. Altogether 10 different market participants participated in the auctions.

By the end of 2021 CROPEX also organized an auction 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.

ECO Balance Group Auctions

List of auctions	Auction date	Number of participants	Power sold MWh/h	Average Weighted Price EUR/MWh/h
Yearly Auction for the sale of electricity from ECO BG in 2022	2021-04-26	9	60	62.21
Yearly Auction for the sale of electricity from ECO BG in 2022	2021-09-28	6	60	121.32
Yearly Auction for the sale of electricity from ECO BG in 2023	2021-09-29	6	60	84.07
Yearly Auction for the sale of electricity from ECO BG in 2024	2021-09-30	3	60	73.23

Losses Auctions

List of auctions	Auction date	Number of participants	Power bought MWh/h
Energy delivery to cover transmission system losses in 2022	2021-11-26	4	10



CONTACT

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Ivica Toljan – Member of the Board