



Linear Order for Dynamic Containment on EPEX –
further explanation to mock auction

A linear order is related to a bidding level – **in this case DCL**, a portfolio and a set of periods – **in this case there are 6 of them as we procure 6 EFA blocks at the same time.**

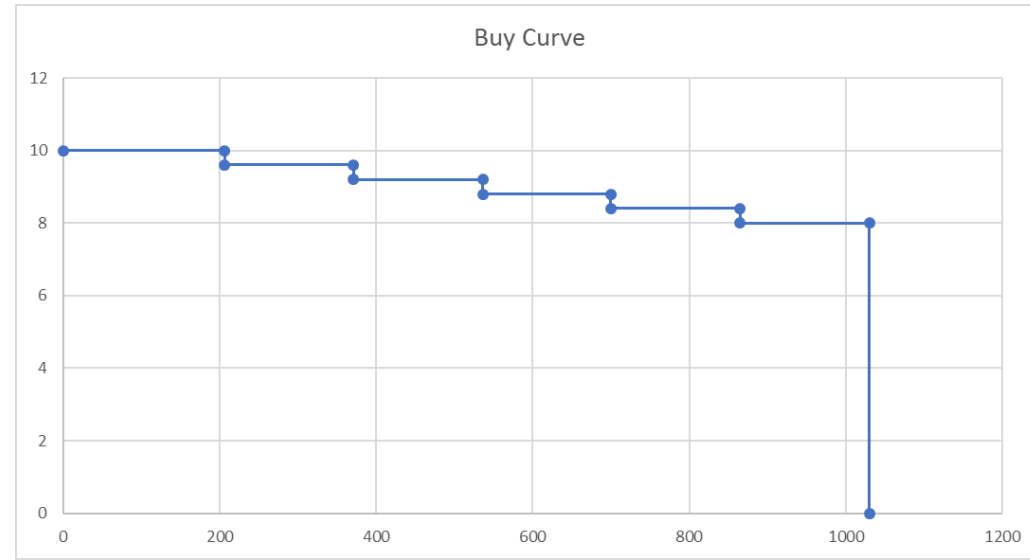
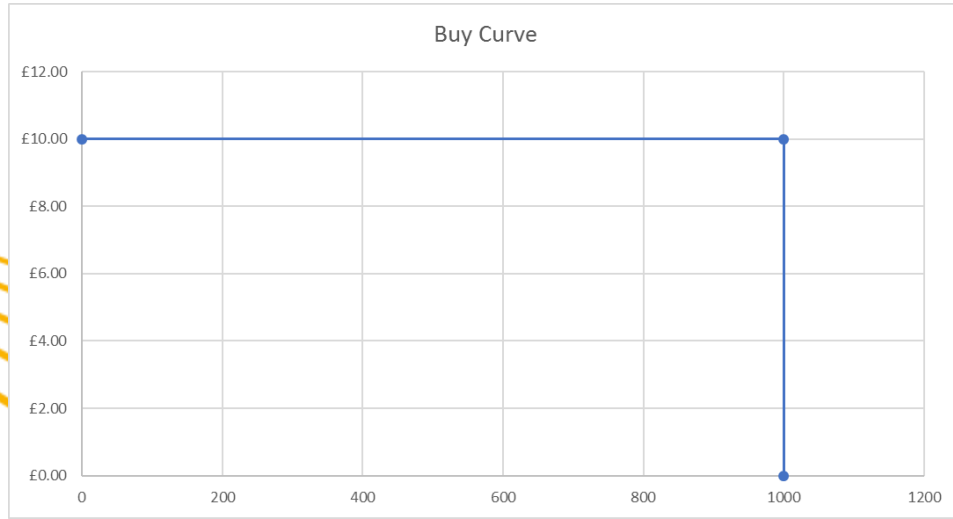
For each of these periods, the linear order is related to a curve which defines for each price between the minimum and maximum prices of the market the willingness to buy or sell a certain amount. The characteristics of a stepwise curve are following:

- A stepwise order is defined by n (price, quantity) couples between the minimum price (P_{min}) and the maximum price (P_{max}): $[(P_{min}, Q_1), \dots, (P_{max}, Q_n)]$
- For any couple $(P_i, Q_i), (P_{i+1}, Q_{i+1})$ within this list we have either:
 - o $P_i < P_{i+1}$ and $Q_i = Q_{i+1}$
 - or
 - o $P_i = P_{i+1}$ and $Q_i > Q_{i+1}$ excluding P_{min}, P_{max}

Stepwise curve – example 1

Types of linear order

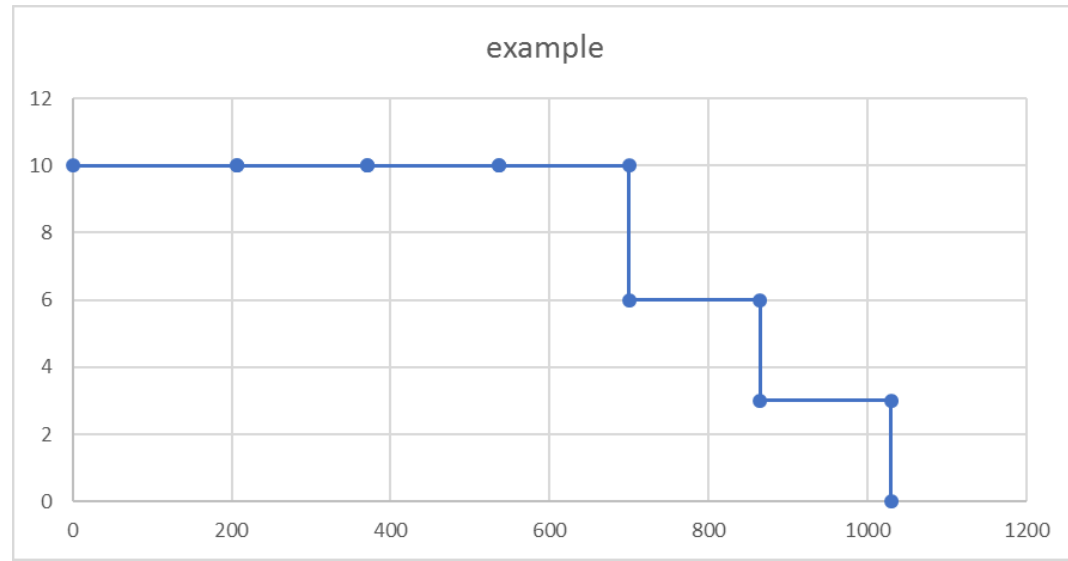
No-stepwise curve example



The less I am procuring, the more I am willing to pay. The first MWs are most valuable for me.

In this example I am willing to pay up to £10/MW/h to secure the first 200 MW as they are most valuable to me. The further MWs are becoming less beneficial, although still valuable and I am willing to procure the volume but at lower cost.

Stepwise curve – example 2



In this example, the curve indicates that the most valuable volume for me is the first 650 MW and I am willing to pay for it more than for the remaining of the requirement.

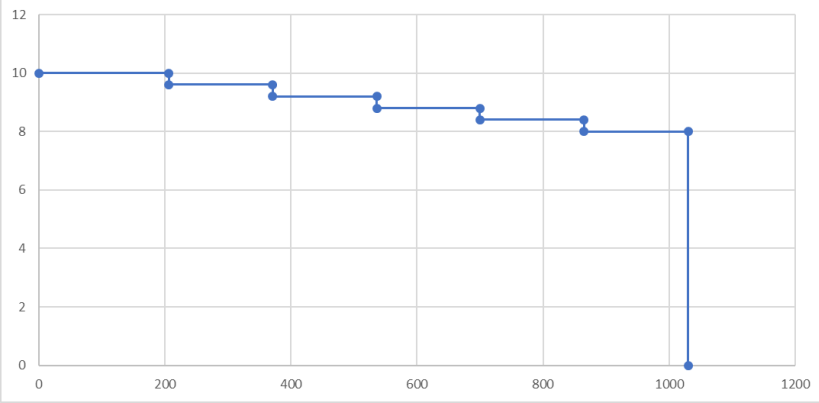
MarketNa	BiddingLevelName	MemberName	OrderID	Portfolio	OrderEntryTime	OrderEntry	Settlement	OrderPeric	TradeID	EFA	DeliveryStart	DeliveryEnd	ExecutedVolume	1P	1V	2P	2V	3P	3V
DCL	DCL	NATIONAL GRID ESO	1E+14	NGESO-T001	20/07/2021 13:14	NGESO-A	GBP	1E+14	1E+14	1	21/07/2021 23:00	22/07/2021 03:00	351	0	1030	8	1030	8	865
DCL	DCL	NATIONAL GRID ESO	1E+14	NGESO-T001	20/07/2021 13:14	NGESO-A	GBP	1E+14	1E+14	2	22/07/2021 03:00	22/07/2021 07:00	462	0	1033	13.2	1033	13.2	868
DCL	DCL	NATIONAL GRID ESO	1E+14	NGESO-T001	20/07/2021 13:14	NGESO-A	GBP	1E+14	1E+14	3	22/07/2021 07:00	22/07/2021 11:00	423	0	1359	10.4	1359	10.4	1142
DCL	DCL	NATIONAL GRID ESO	1E+14	NGESO-T001	20/07/2021 13:14	NGESO-A	GBP	1E+14	1E+14	4	22/07/2021 11:00	22/07/2021 15:00	471	0	1376	13.33	1376	13.33	1156
DCL	DCL	NATIONAL GRID ESO	1E+14	NGESO-T001	20/07/2021 13:14	NGESO-A	GBP	1E+14	1E+14	5	22/07/2021 15:00	22/07/2021 19:00	470	0	1175	12	1175	12	987
DCL	DCL	NATIONAL GRID ESO	1E+14	NGESO-T001	20/07/2021 13:14	NGESO-A	GBP	1E+14	1E+14	6	22/07/2021 19:00	22/07/2021 23:00	444	0	974	11.2	974	11.2	818

4P	4V	5P	5V	6P	6V	7P	7V	8P	8V	9P	9V	10P	10V	11P	11V	12P	12V	13P	13V	14P	14V
8.4	865	8.4	700	8.8	700	8.8	536	9.2	536	9.2	371	9.6	371	9.6	206	10	206	10	0	999.99	0
13.86	868	13.86	702	14.52	702	14.52	537	15.18	537	15.18	372	15.84	372	15.84	207	16.5	207	16.5	0	999.99	0
10.92	1142	10.92	924	11.44	924	11.44	707	11.96	707	11.96	489	12.48	489	12.48	272	13	272	13	0	999.99	0
13.99	1156	13.99	936	14.66	936	14.66	716	15.33	716	15.33	495	15.99	495	15.99	275	16.66	275	16.66	0	999.99	0
12.6	987	12.6	799	13.2	799	13.2	611	13.8	611	13.8	423	14.4	423	14.4	235	15	235	15	0	999.99	0
11.76	818	11.76	662	12.32	662	12.32	506	12.88	506	12.88	351	13.44	351	13.44	195	14	195	14	0	999.99	0

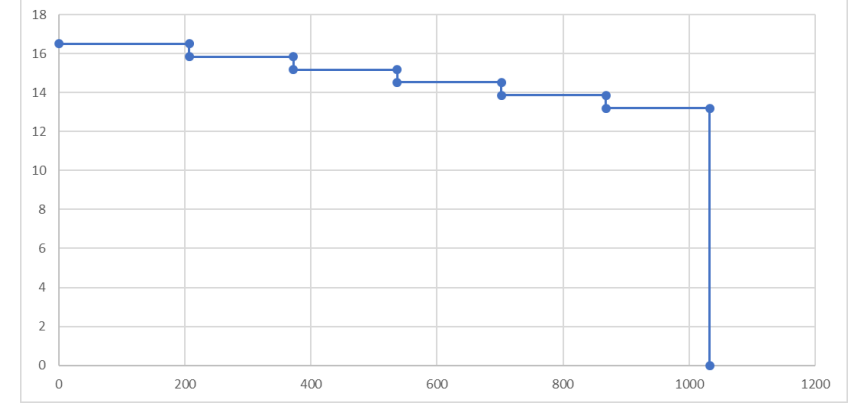
Stepwise curve used in mock auction for DCL on EPEX in 21 July 2021.

Graphical representation of stepwise curve used in mock auction for DCL on EPEX in July 2021

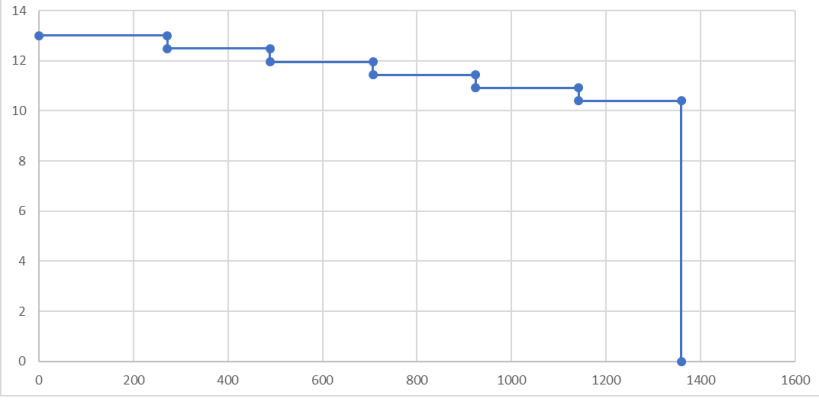
EFA 1



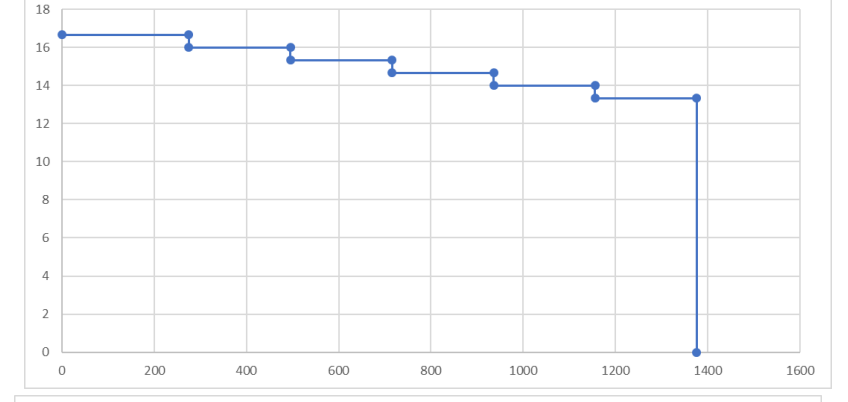
EFA 2



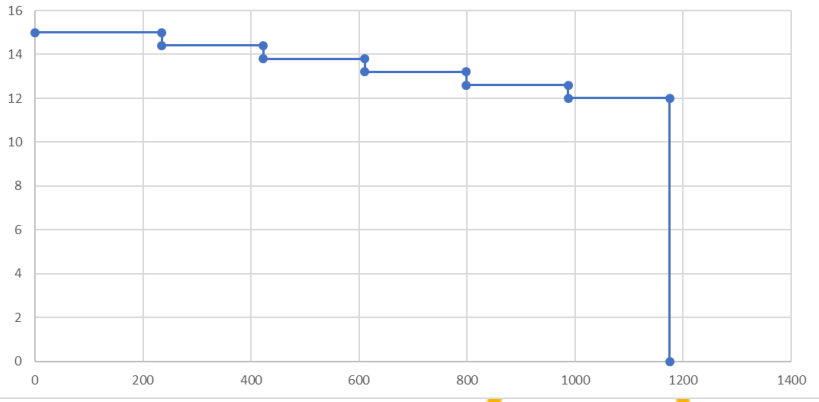
EFA 3



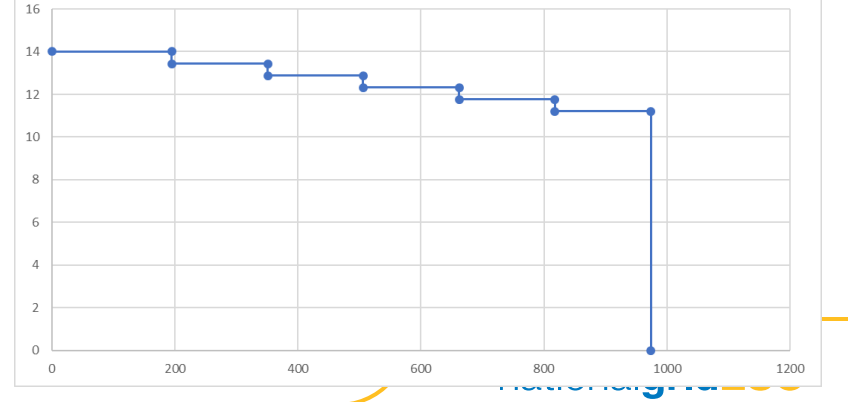
EFA 4



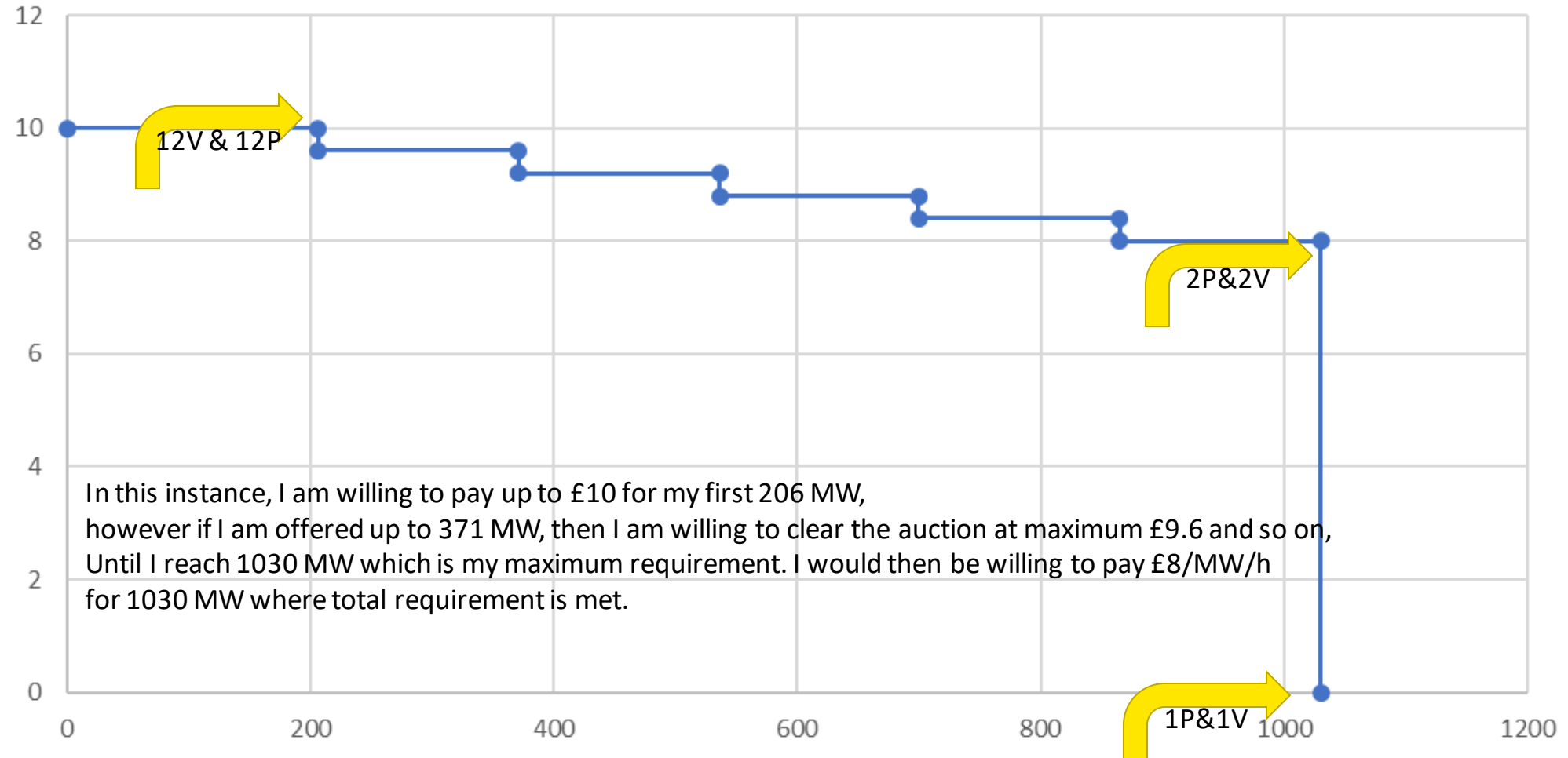
EFA 5



EFA 6



EFA 1

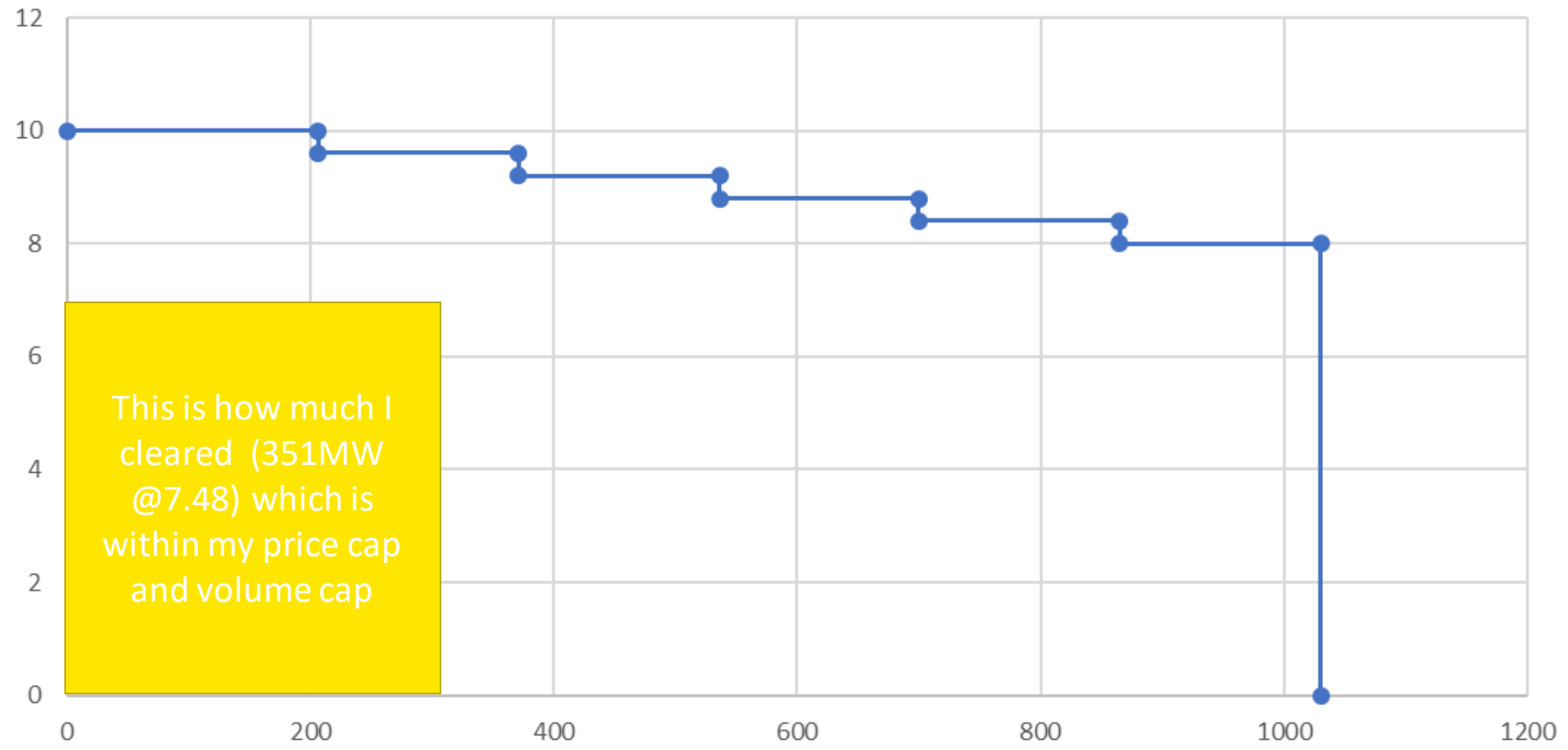


In this instance, I am willing to pay up to £10 for my first 206 MW, however if I am offered up to 371 MW, then I am willing to clear the auction at maximum £9.6 and so on, Until I reach 1030 MW which is my maximum requirement. I would then be willing to pay £8/MW/h for 1030 MW where total requirement is met.

Linear order for EFA 1, data pasted special transpose from original file

MarketName	DCL
BiddingLevelName	DCL
MemberName	NATIONAL GRID ESO
OrderID	100000000000275
Portfolio	NGESO-T001
OrderEntryTime	20/07/2021 13:14
OrderEntryUser	NGESO-A
SettlementCurrency	GBP
OrderPeriodID	100000000000378
TradeID	100000000000378
EFA	1
DeliveryStart	21/07/2021 23:00
DeliveryEnd	22/07/2021 03:00
ExecutedVolume	351
1P	0
1V	1030
2P	8
2V	1030
3P	8
3V	865
4P	8.4
4V	865
5P	8.4
5V	700
6P	8.8
6V	700
7P	8.8
7V	536
8P	9.2
8V	536
9P	9.2
9V	371
10P	9.6
10V	371
11P	9.6
11V	206
12P	10
12V	206
13P	10
13V	0
14P	999.99
14V	0

EFA 1



This is how much I cleared (351MW @7.48) which is within my price cap and volume cap

MarketName	DCL
BiddingLevelName	DCL
MemberName	NATIONAL GRID ESO
OrderID	100000000000275
Portfolio	NGESO-T001
OrderEntryTime	20/07/2021 13:14
OrderEntryUser	NGESO-A
SettlementCurrency	GBP
OrderPeriodID	100000000000378
TradeID	100000000000378
EFA	1
DeliveryStart	21/07/2021 23:00
DeliveryEnd	22/07/2021 03:00
ExecutedVolume	351
1P	0
1V	1030
2P	8
2V	1030
3P	8
3V	865
4P	8.4
4V	865
5P	8.4
5V	700
6P	8.8
6V	700
7P	8.8
7V	536
8P	9.2
8V	536
9P	9.2
9V	371
10P	9.6
10V	371
11P	9.6
11V	206
12P	10
12V	206
13P	10
13V	0
14P	999.99
14V	0

