Residential Electricity Pricing Offer

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Residential Electricity Pricing Offer

Goals

Understand how an energy supplier builds and prices a residential electricity offer.

Building and pricing two competitive offers:
- one with energy directly bought to the producer
- one with energy bought on the market with a Guarantee of Origin (GO)

Try to find out if you energy supplier is really the one you want to.

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Summary

1. Components of the energy part
2. Pricing the energy part components
    1. Energy part from market
    2. Energy part directly to the producer
    3. Balancing fees
    4. Guarantee of Origin (GO)
    5. Capacity

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3. Components of the energy part

Producer

TSO

DSO

Residential Consumer

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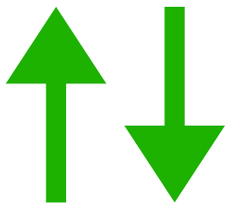
3. Components of the energy part

Energy part:
- energy
- balancing fees
- Guarantee of Origin (GO)
- capacity

Markets: EEX, EPEXSPOT

Producer



Energy supplier

Residential Consumer

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4. Pricing the energy part components: the energy

Energy part:
- **energy**
- balancing fees
- Guarantee of Origin (GO)
- capacity

Markets: EEX, EPEXSPOT

EEX:
Calendars
Quarters
Months
Weeks
Days

EPEXSPOT:
Spot
Intraday

Producer

Energy supplier

Fixed price
Indexed price
Fixed within a threshold then indexed outside

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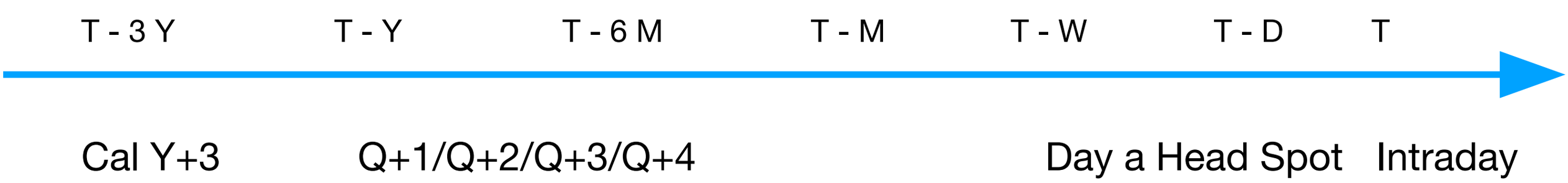
4. Pricing the energy part components: buying to the market

Minimizing the **risk aversion** by buying futures products on different **horizons**:

- Calendar: Y+1/Y+2/Y+3 *-> to buy 3 years in advance*
- Quarter: Q+1/Q+2/Q+3/Q+4 *-> to buy 12 - 6 months in advance*
- Months: M+1/M+2…/M+12 *-> to buy 3 - 1 months in advance*
- Weeks: W+1/W+2…
- Days:D+1/D+2 …



$$Price = P_{cal} + P_Q + P_M + P_W + P_D + P_{Spot}$$

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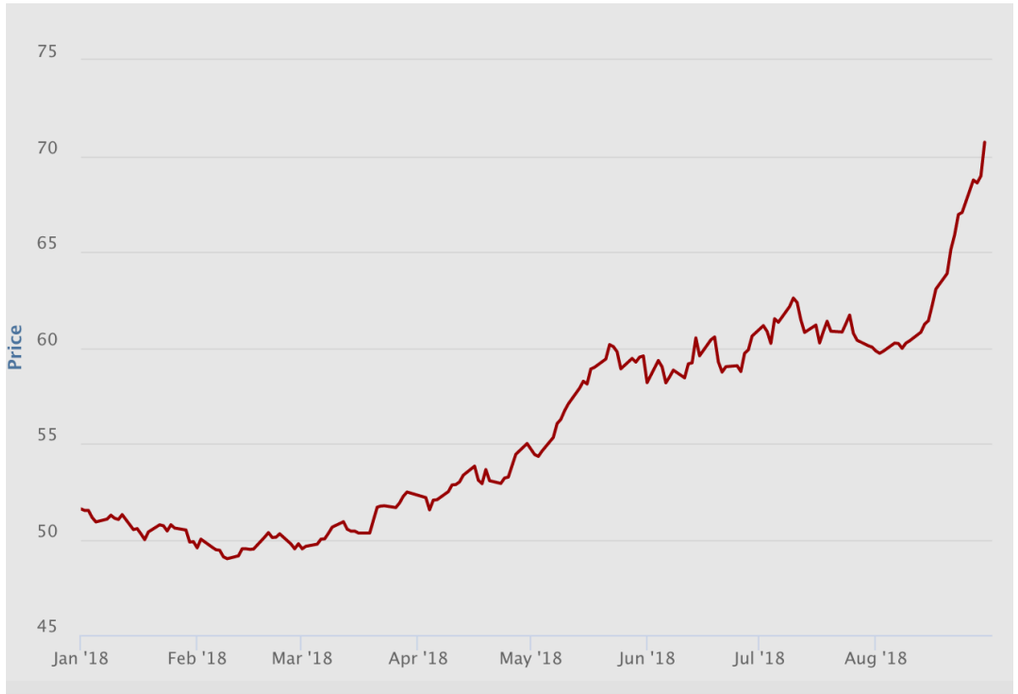
4. Pricing the energy part components: buying to the market

EEX cal20 historic from 2016-2018



EEX Q1 2019 historic from 2018

T - 3 Y T - Y T - 6 M T - M T - W T - D T

Cal Y+3 Q+1/Q+2/Q+3/Q+4 Day a Head Spot Intraday

$$Price = P_{cal} + P_Q + P_M + P_W + P_D + P_{Spot}$$

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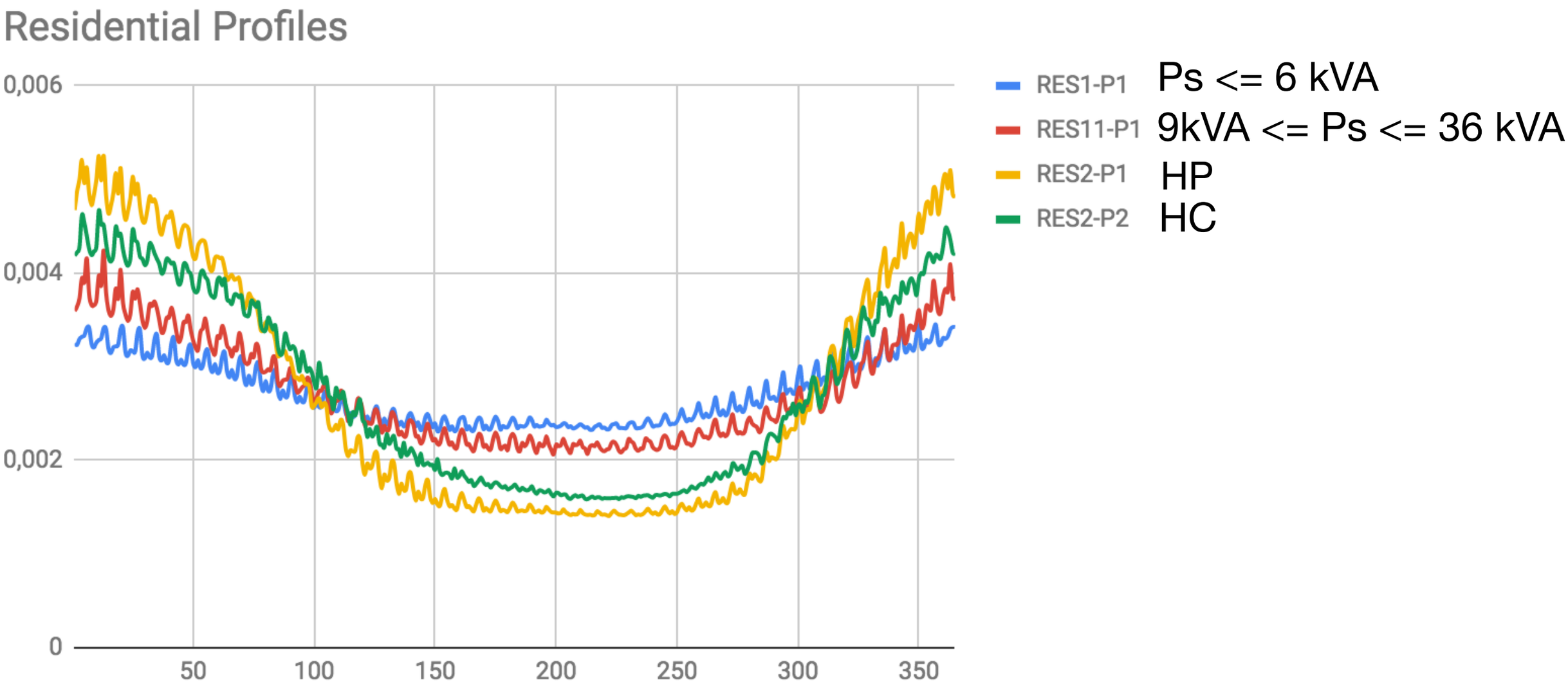
4. Pricing the energy part components: buying to the market



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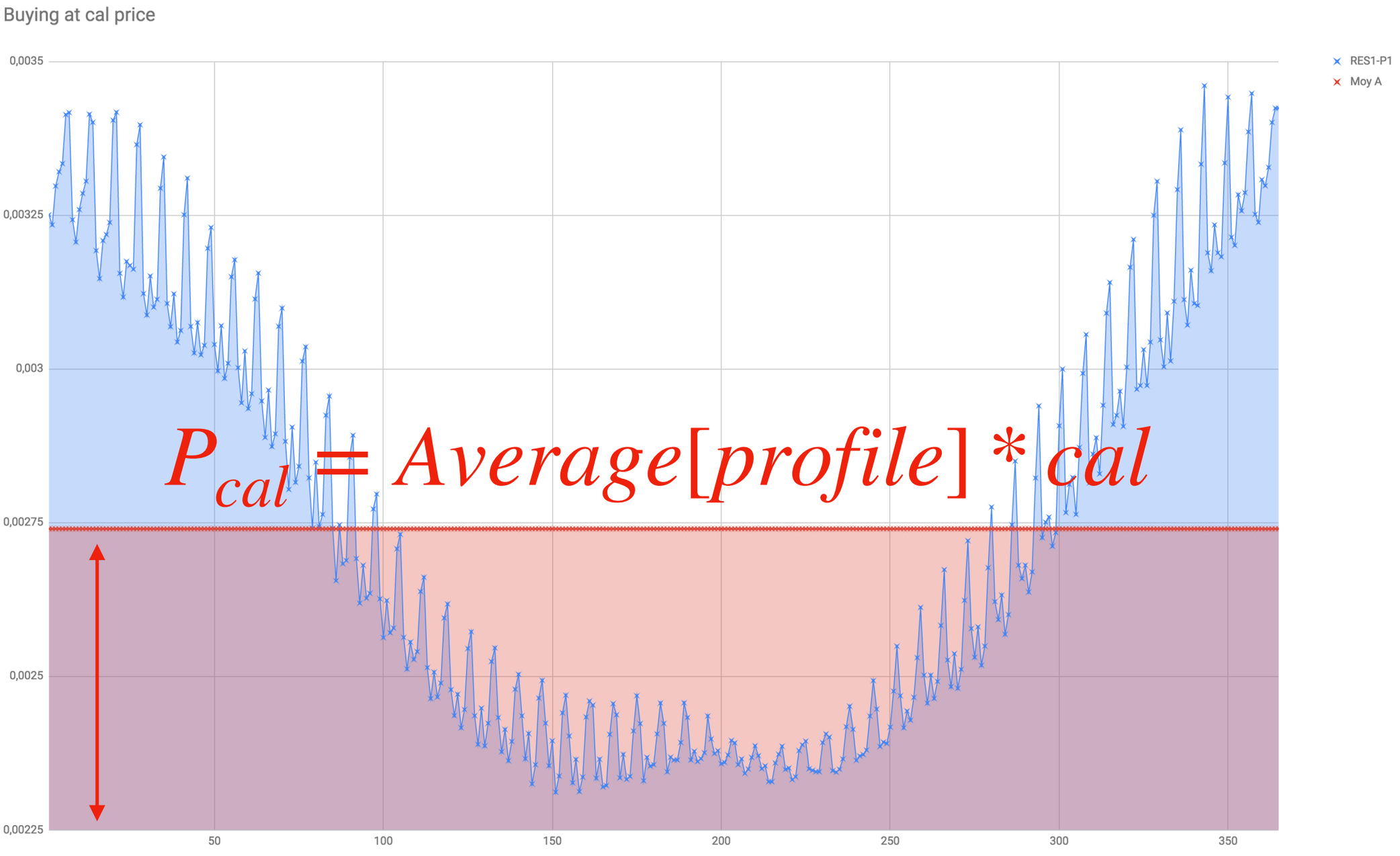

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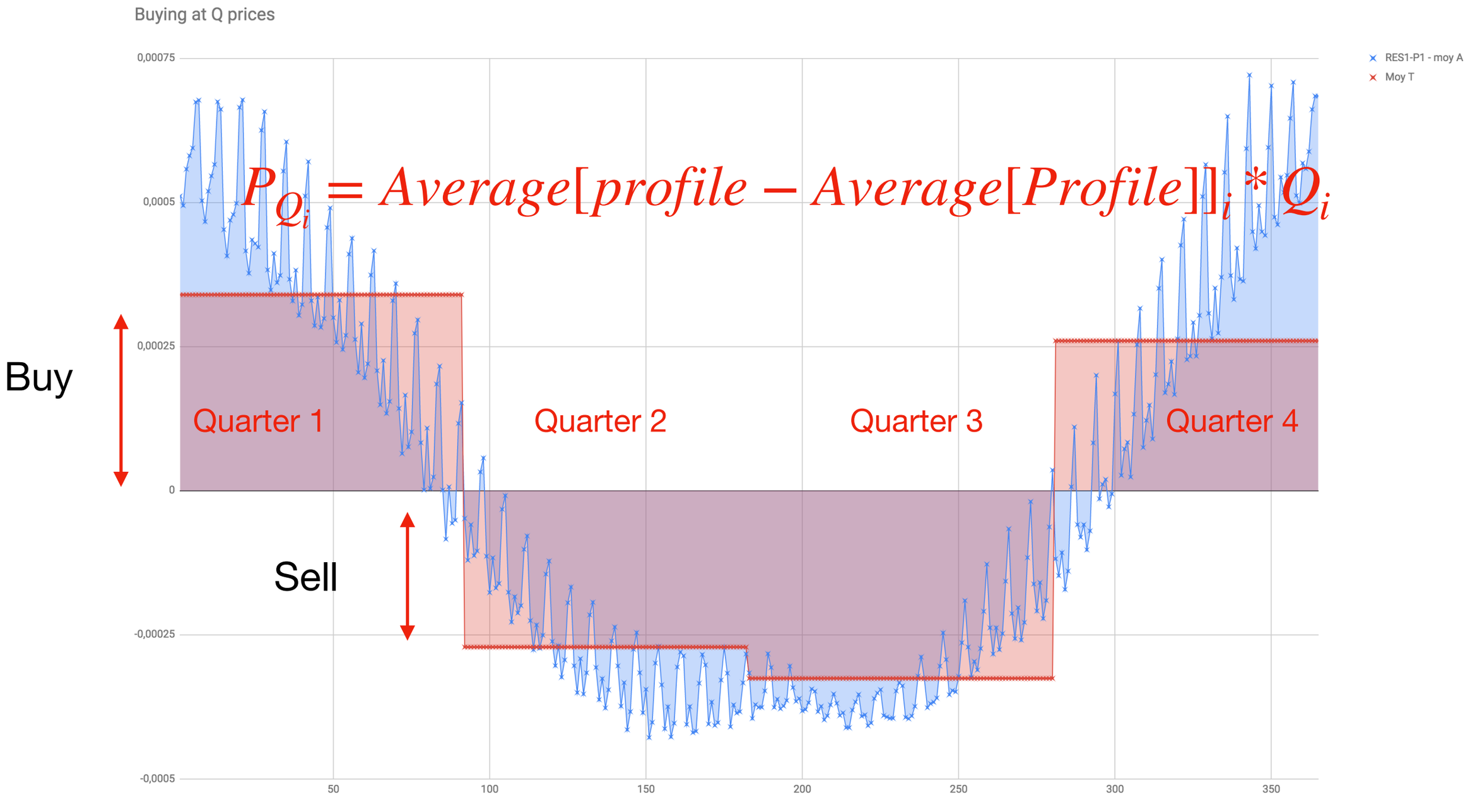

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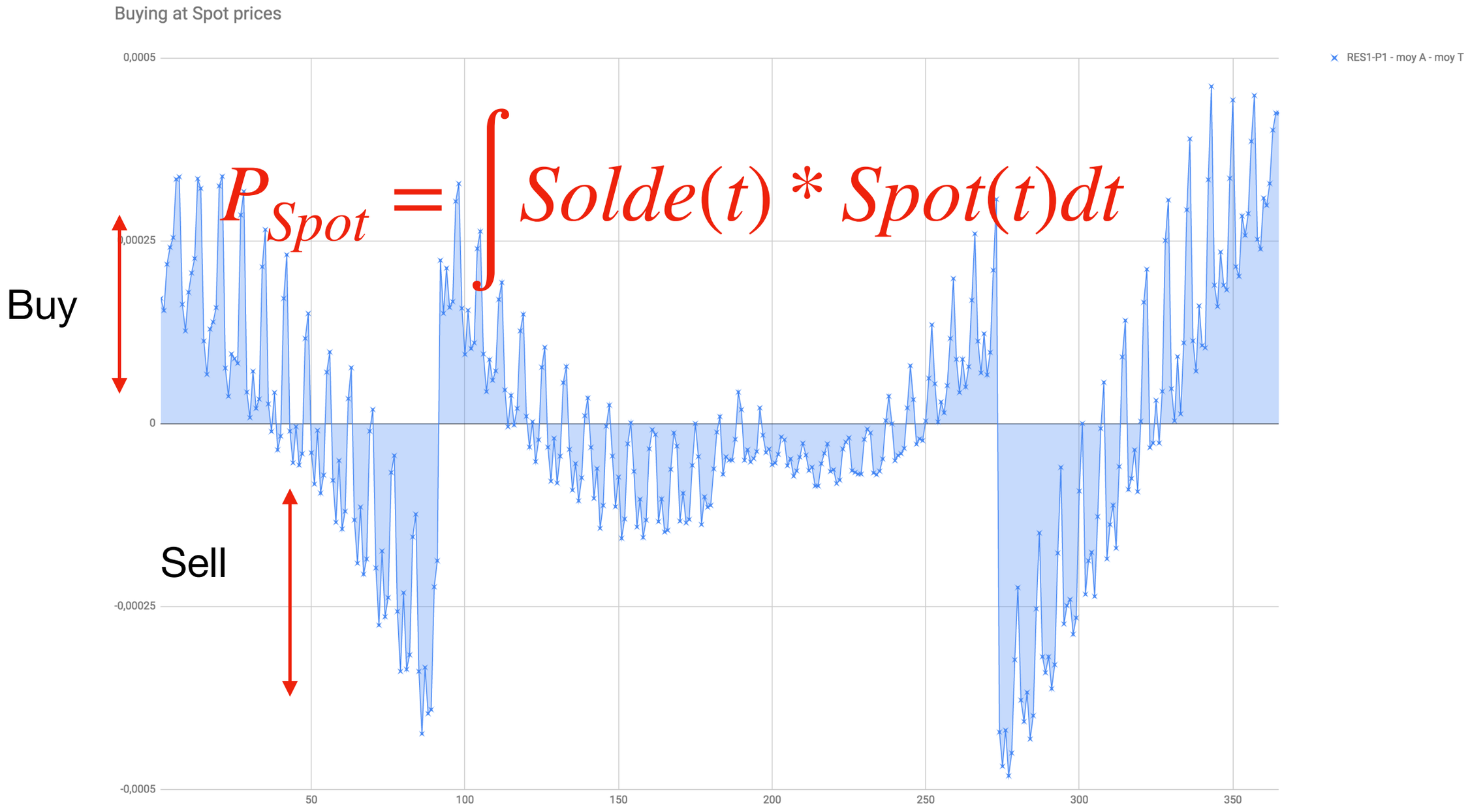

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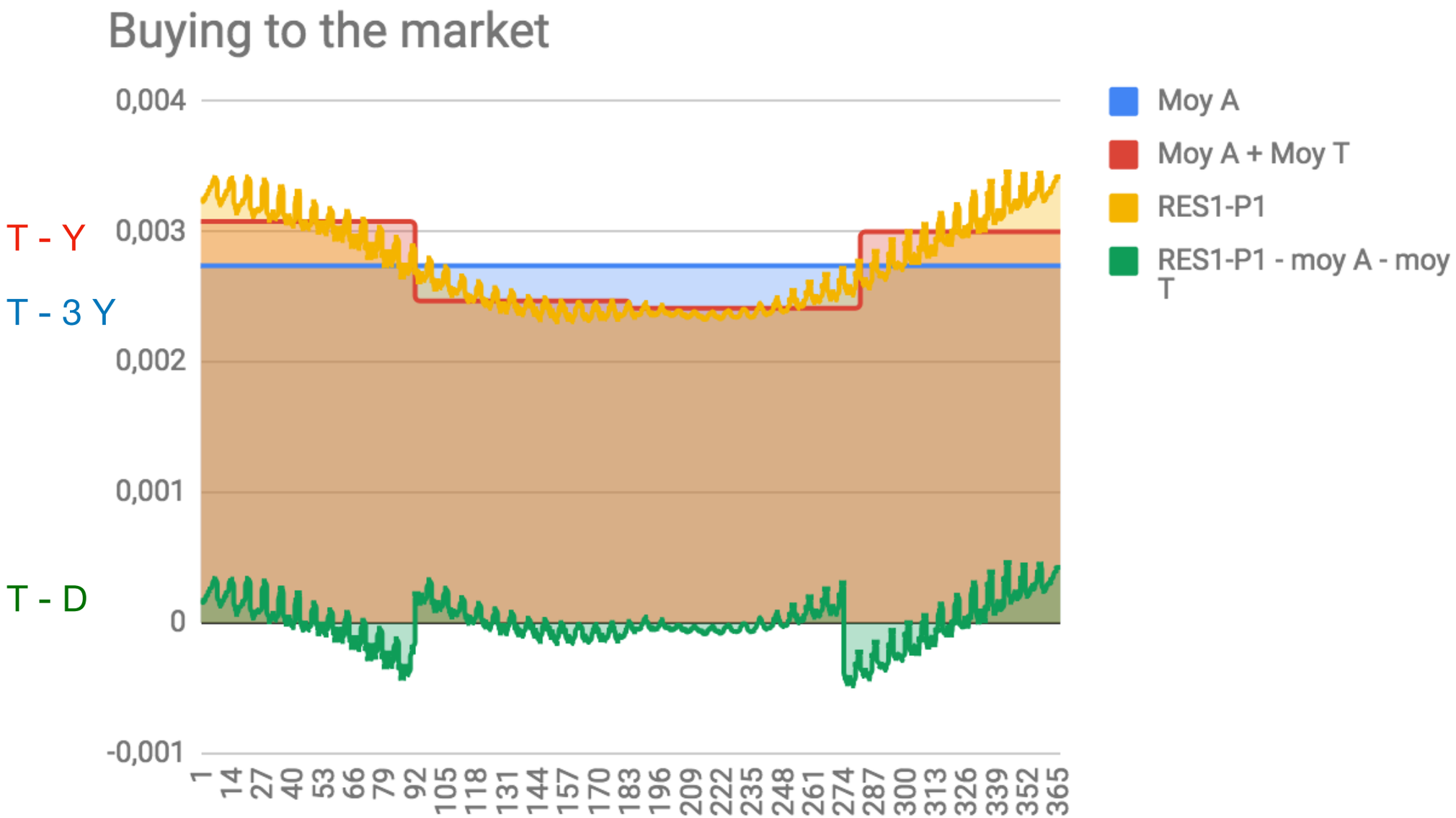

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4. Pricing the energy part components: buying to the market

	EEX Settl
Q1 2019	68.95 €
Q2 2019	45.47 €
Q3 2018	46.43 €
Q4 2018	61.42 €
Cal19	55.50 €
Spot recalé en cal & Q	54.93 €

	RES1-P1	RES11-P1	RES2-P1 (HP)	RES2-P2 (HC)
Achat Cal	€55.50	€55.50	€55.50	€55.50
Achat Quarter	1.07 €	1.71 €	3.99 €	3.05 €
Achat Spot recalé en cal & Q	2.47 €	2.30 €	6.04 €	-6.04 €
Frais Bloc	0.00 €	0.00 €	0.00 €	0.00 €
Frais Spot	0.15 €	0.13 €	0.33 €	0.54 €
Prix Achat (euros/MWh)	59.19 €	59.63 €	65.86 €	53.06 €

Frais	(euros/MWh)
Frais blocs au settlement NEB	0
Frais blocs au settlement RE	0
Frais d'équilibrage +/-	0.6

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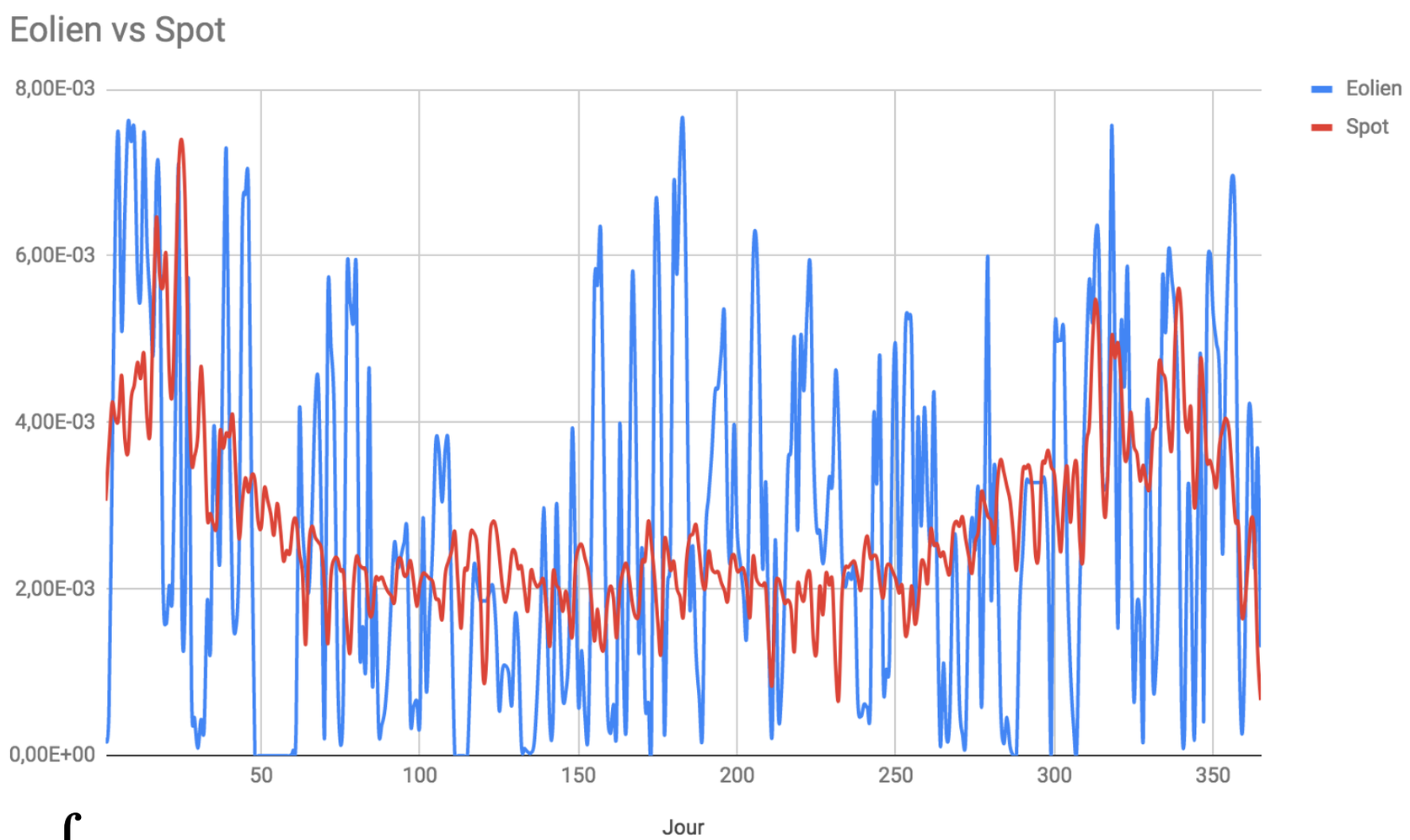
4. Pricing the energy part components: buying to the producer



$$Price = \int P(t) * Spot(t)dt$$ 48 euros / MWh with Spot 2017 on this production

$$Price(t) = Spot(t) - X$$ X = 0.5 euros / MWh

Price = 48 if 40 < Spot < 48
Else Price = Spot - X

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4. Pricing the energy part components: the balancing fees

Energy part:
- energy
- **balancing fees**
- Guarantee of Origin (GO)
- capacity

TSO

Main grid balancing responsible

Producer

Energy supplier

CC: forecast errors for consumption

CP: forecast errors for production

CR: production profile is not equal to consumption profile

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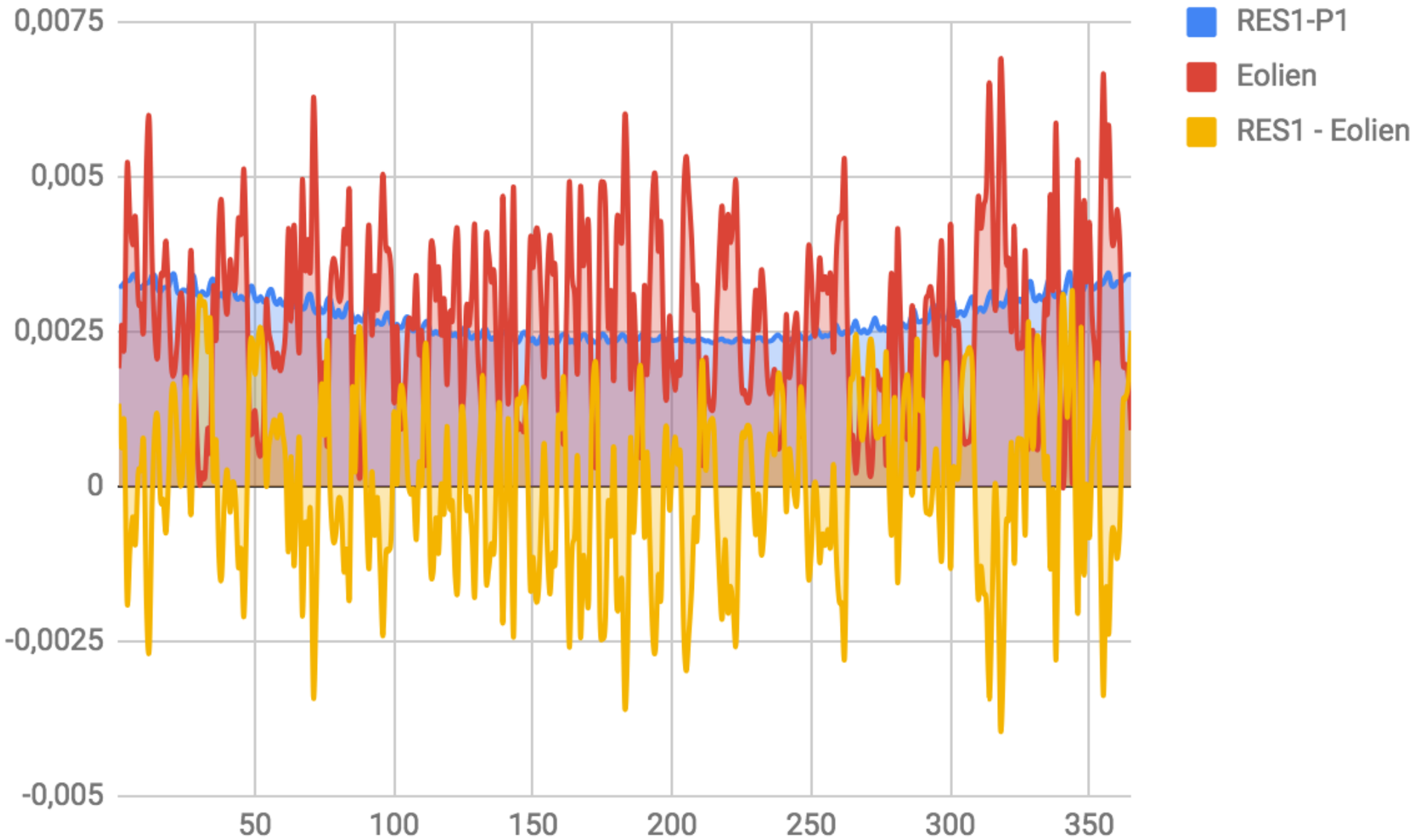
4. Pricing the energy part components: balancing fees CR



$$C_R = \int [RES1(t) - Eolien(t)] * Spot(t)dt$$

C_R 2017 = 0,24 euros / MWh

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4. Pricing the energy part components: balancing fees CP

The better the forecast is the smaller are Cc & Cp

$$C_P = \int [P(t) - P_p(t)] * [Spot(t) - Ecart(t)]dt$$

$$P(t) : production(t) \quad [P(t) - P_p(t)] > 0 \rightarrow selling\ at\ Ecart_{>0}$$
$$P_p(t) : forecast(t) \quad [P(t) - P_p(t)] < 0 \rightarrow buying\ at\ Ecart_{<0}$$

$$if\ [Ecart_{>0} > Spot(t)] \rightarrow P_p(t) = 0\ leads\ to\ greater\ profit\ than\ P_p(t) = P(t)$$

Wind power: **0, 7** < C_P < **2 euros / MWh**
Hydraulic power: **0, 2** < C_P < **1 euros / MWh**
Solar power: **0, 5** < C_P < **1.5 euros / MWh**

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4. Pricing the energy part components: balancing fees CC

The better the forecast is the smaller are Cc & Cp

$$C_C = \int [C(t) - C_p(t)] * [Ecart(t) - Spot(t)]dt$$

$$C(t) : consumption(t) \quad [C(t) - C_p(t)] > 0 \rightarrow buying\ at\ Ecart_{<0}$$
$$C_p(t) : forecast(t) \quad [C(t) - C_p(t)] < 0 \rightarrow selling\ at\ Ecart_{>0}$$

$$if\ [Ecart_{<0} < Spot(t)] \rightarrow C_p(t) = 0\ leads\ to\ greater\ profit\ than\ C_p(t) = C(t)$$

Residential: C_C <= **0.7 euros / MWh**

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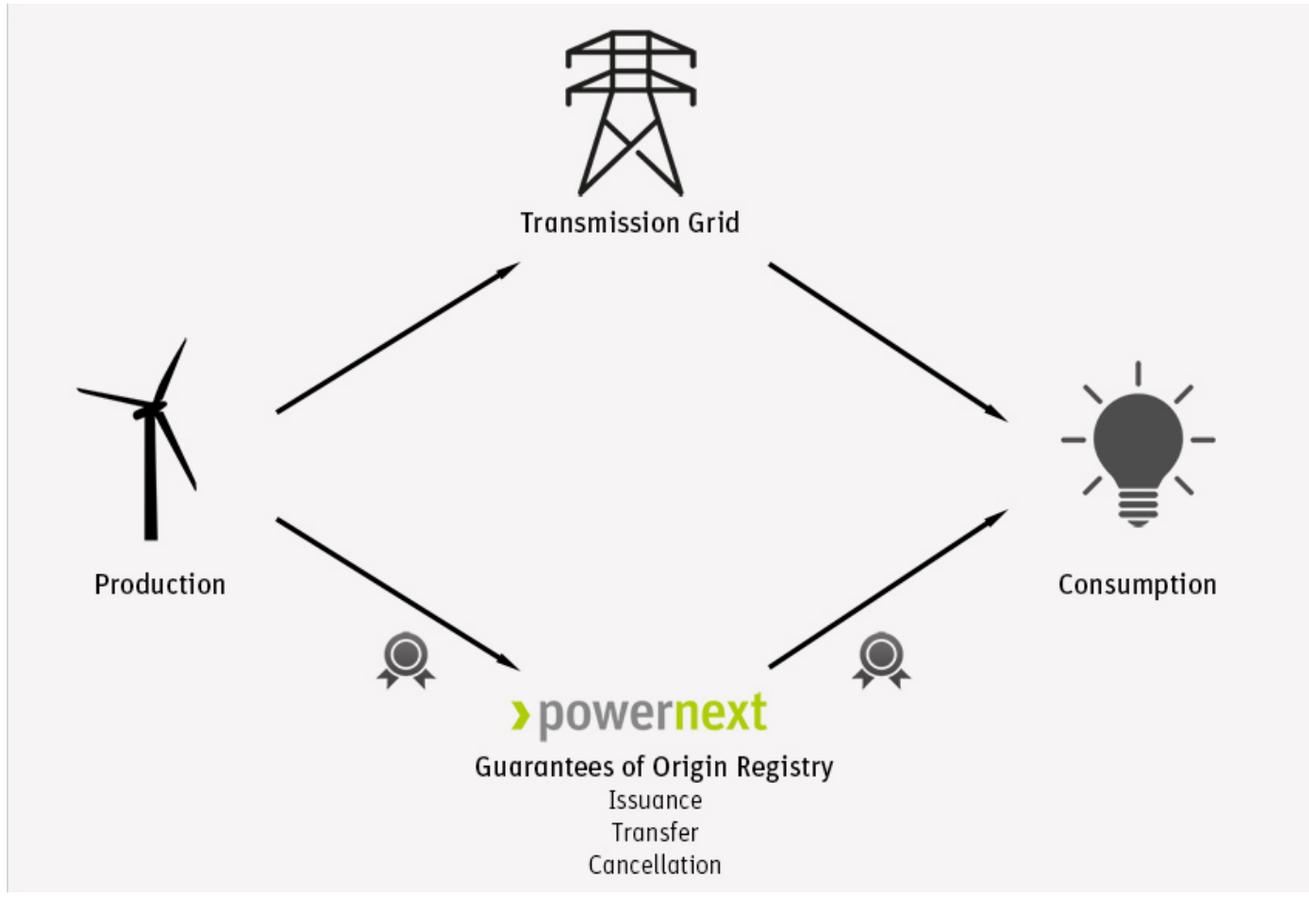
4. Pricing the energy part components: green certificates

Energy part:
- energy
- balancing fees
- Guarantee of Origin (GO)
- capacity



0.5 < Prices < 2 euros / MWh

1 GO = 1 MWh produced

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5. Pricing the energy part components: capacity

Energy part:
- energy
- balancing fees
- green certificates
- **capacity**

Energy supplier

Buy the capacities required for its portfolio.

Producer

Given the generation curve (peaks) the TSO estimate the capacity potential (kW per kW installed) <1 that can sold on the market.

Residential Consumer

Given the consumption curve (peaks) the TSO estimate the capacity needed for a given portfolio.

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5. Pricing the energy part components: capacity

Energy part:
- energy
- balancing fees
- green certificates
- **capacity**

Capacity Price = 10 000 euros / MW

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Conclusion

Energy part (1/3 of the total electricity bill):

- energy
- balancing fees
- Guarantee of Origin (GO)
- capacity

Markets: EEX, EPEXSPOT

Producer

Energy supplier

Residential Consumer