Energia Group Analytathon

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Agenda

- Energia Group Overview
- The Markets
- The Project
- Background Data

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Energia Group

A modern customer centric utility focusing on renewable technology to deliver optimal solutions for our customers

Energia Group

energia group 1,010

How to join our journey:
-Placement Programme
-Graduate Trading Programme
-Full Time roles

Customer Solutions

-supply electricity & gas to customers in NI and ROI
-25% of Ireland total energy

power ni part of energia group

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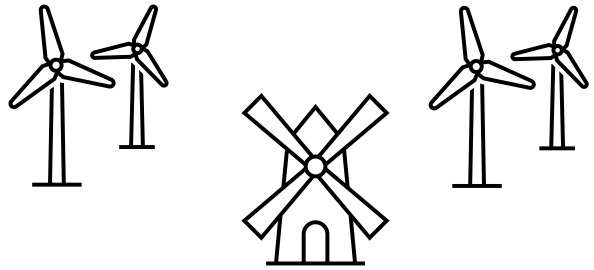
Renewables

-own, operate & trade renewable assets
-21% of Ireland total wind energy

energia BIO ENERGY

energia RENEWABLES



Flexible Generation

-own, operate & trade thermal power stations
-20% of Ireland's electricity demand

power ni Power Procurement Business part of energia group

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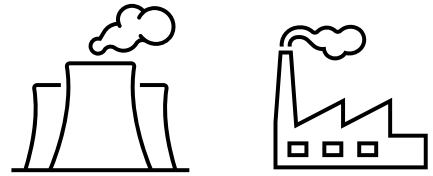

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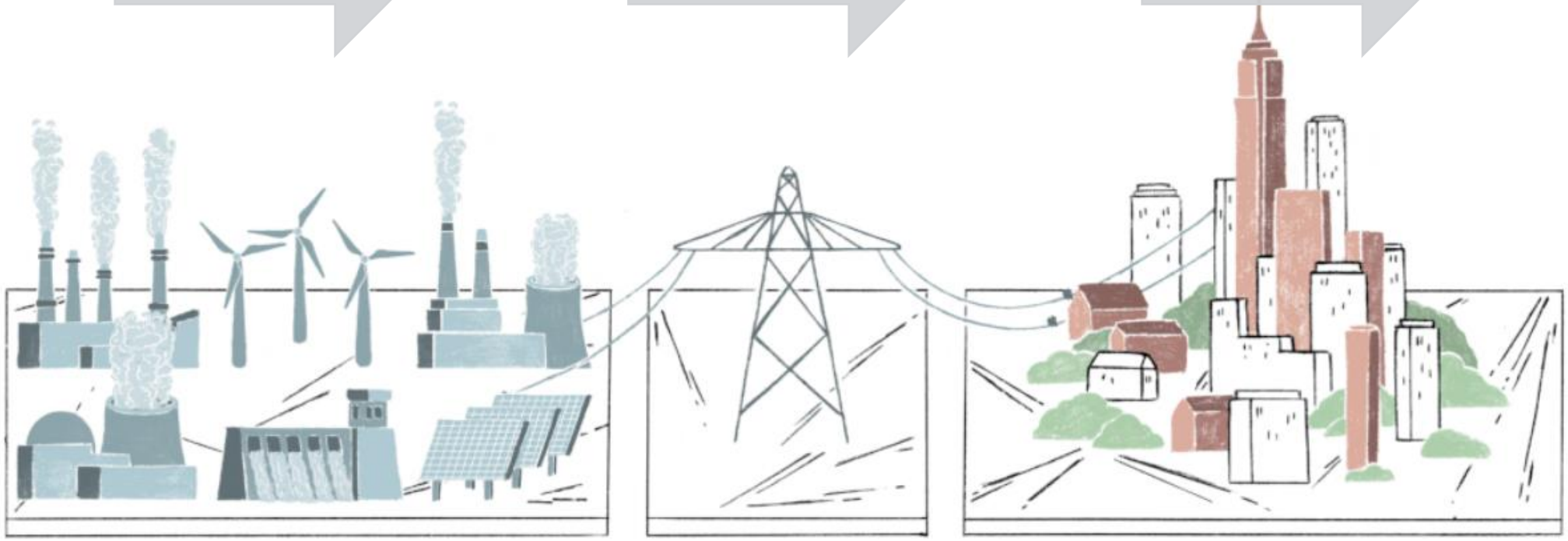
Electricity system overview

Generators — Generate the electricity through their assets

Network — Transport electricity from generators to homes and businesses

Suppliers — Sell and bill customers for electricity use



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Background

Energia Group is the leading independent energy company in the all-Ireland market. Energia supplies electricity to businesses throughout Ireland and to homes in the ROI.

Energia Supply buys electricity from the All-Island market and sells it on to the relevant homes/businesses. This electricity is bought across 5 markets with differing prices.

To optimise the business, Energia try to buy the electricity in the cheapest market possible through a combination of price forecasting and market trend analysis.

Energy prices are impacted by multiple factors including demand, wind, fuel prices, forecast error and generator costs.

The Markets

The All Island Market trading day (D) starts at 11pm and runs for 24 hours. The markets in which a supplier can buy electricity are shown below, the markets are half hourly.

Market	Gate Closure	Auction Period
DAM	D-1 11am	D-1 23:00 to D 23:00
IDA1	D-1 17:30	D-1 23:00 to D 23:00
IDA2	D 08:00	D 11:00 to D 23:00
IDA3	D 14:00	D 17:00 to D 23:00
BM	Half hourly	Last Half hour

Energia can buy electricity across any of the markets to meet its customer needs. Energia currently try to forecast the cheapest markets to purchase the electricity. If Energia fail to buy the required electricity they are charged the BM (balancing market) price; note Energia can just choose to buy the energy in the BM market.

Note, every supplier must be balanced in each half hour. If a supplier has sold 100MW to customers in a half hour, it needs to buy 100MW in that half hour.

Energy can not be bought in one half hour and moved to another half hour.

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The Markets

Energia will provide the following variables

- DAM Price – Output from auction
- IDA1 Price – Output from auction
- IDA2 Price – Output from auction
- IDA3 Price – Output from auction
- BM Price – Output from auction
- Net Imbalance Volume – Output from auction
- Daily Gas Price – Known before auction
- Forecast Wind Output – Known before auction
- Forecast Demand – Known before auction
- GB Electricity Price – Known before auction

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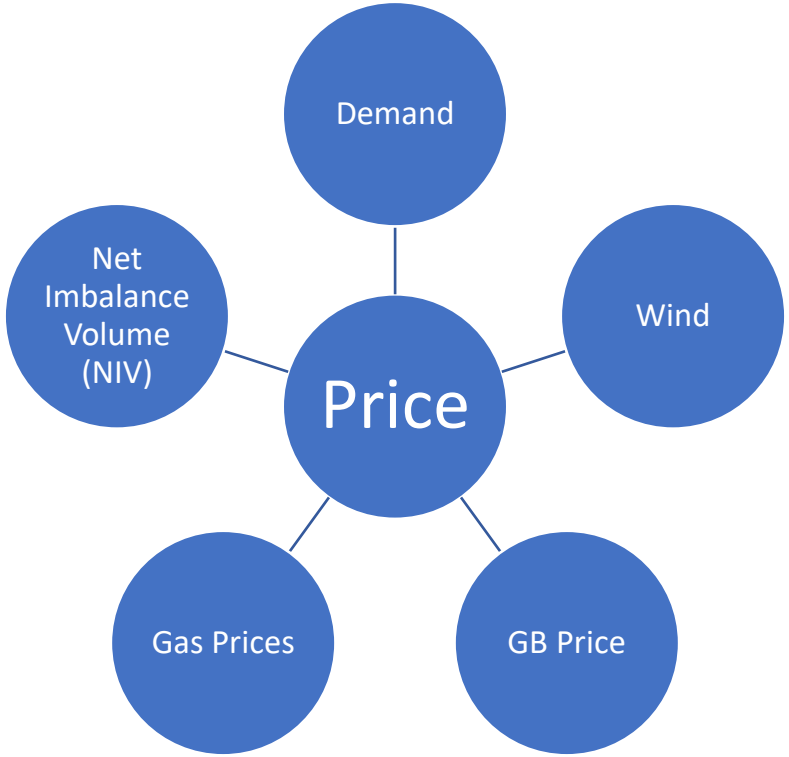
The Project

1) Assume Energia have 100MW of electricity to buy in each half hour of the day. How can Energia optimise the purchases in ISEM (compared to buying everything in DAM)? What factors drive this decision? Develop a trading strategy based on demand, wind, GB Price and gas price (the only 4 variables we know before the auctions) that we can use to buy our demand for D+1.

2) Energia don't like volatility in PnL, how does the strategy above change if the trader had a max daily loss (PnL compared to buying everything in DAM) of €50k?



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Some General Notes

- For Example IDA1 profitability (€) compared to DAM for 100MW in a single half hour is calculated as:

((DAM Price – IDA1 Price)*100)/2

- Net Imbalance Volume is not known before the price is published and only impacts the BM price. This number describes now balanced the market is. If this number is positive, there is more demand than generation and the market is short which will mean BM price is likely to be high. If this number is negative, there is more generation than demand and the market is long which will mean BM price is likely to be low.

- BM prices are very volatile, the Net Imbalance Volume (NIV) helps you understand why the BM is high or low in certain periods…but you don't know the NIV ahead of time.

- There will be some missing data in the data sets, also note if the demand is zero, that is effectively missing data.

- Is there a trend across different times of the day/times of the year?

- Wind energy is free and Net Demand (Demand minus Wind) may be more important than Demand itself.

- GB electricity price impacts ISEM price through an electricity interconnector.

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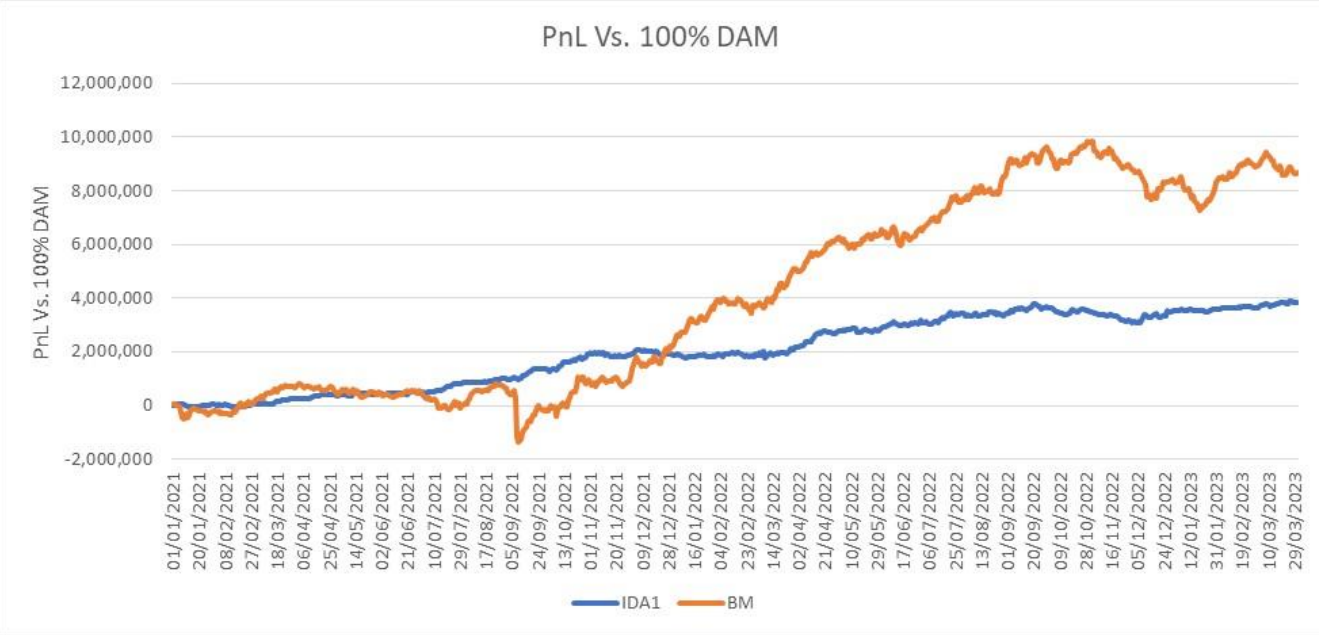
Some General Notes - Volatility

Volatility is not our friend and some markets (BM) are significantly more volatile than others. The graph below highlights the profitability of buying demand in IDA1 or BM compared to DAM.

Buying in the BM (orange line) creates the most benefit however it is a bumpy (volatile) ride to get there, with profitability been as low as minus €1.5m at one stage.

The blue line is buying in IDA1, it may be less profitable but it is also more predictable and doesn't have the huge loss periods.



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Thank you for your time

Q & A