In order to examine the hypothesis that discount of 20% would be effective in reducing customer churn rate, let’s take an analysis to see the effect on the revenue before and after the discount strategy.

## Assumption:

* We will be reviewing the effect of intervention on whole year (12months) revenue because contracts last for a couple of years, not months.
* All customers who are offered a discount accept it and retain until the end of 2016
* Assume that the customers who does not churn in the next 3 months will retain until the end 2016
* Assume for these calculations that the customer does not consume more or less electricity because the price changes. In practice, we would expect

that if the customer's cost goes down then their consumption might increase.

* We will take the actual churn outcomes in calculating the financial impact. Actual churn outcomes are fine if we know them

and are conducting a retrospective analysis of the effectiveness of a strategy. This example of analysis is commonly known as "backtesting", ie seeing

how well a strategy would have performed historically. In practice, actual outcomes may not be available because they are in the future.

An alternative is to optimise predicted/forecast revenue based on the probabilities which are an output from our churn model. In this case, we would

replace the actual churn outcomes ( churn ) with the predicted probability of churn from our model. The results here are obviously model-dependent.

## 2 . Steps to do:

#### We would need to calculate a baseline revenue before any intervention being taken.

If a customer churns on:

* **Jan 1** → you lose **100%** of the revenue.
* **Feb 29 (day 59 of 365)** → you lose about **83.9%**:
  + Because you kept them for 59/365 days, or ~16.1%
  + So you lost **1 - 59/365 = 83.9%**

Since the exact churn day isn’t known, let **average** those two extremes:

avg\_loss = (100% + 83.9%) / 2 = 91.95% ≈ 91.9%

Total revenue before intervention = Total revenue – churn(lost revenue)

energy consumption \* price var (per period) + power price fix per period

+ meter rent

= 56892506

#### Ein Bild, das Text, Schrift, weiß enthält. KI-generierte Inhalte können fehlerhaft sein.

#### Probability rate

In case we give discount of 20% to all customers who are categorised as churn in the next 3 months, the business would be too simplisified and optimistic because we give up only 20% of lost revenue instead of losing 100% churned revenue. However in reality, not every customer has the same probability of churning out, which makes it essential to determine as precise as possible the churn probability based on some predictive model (out of scope of this analysis). In fact, it is possible that the high risk customers given the discount but still churn or loyal customers do churn. Or sometimes discounts are given to low value customer rather than to save high value ones leading to significant decrease in revenue. After all, it is essensial to devise a customised strategy for each customer as a function of price, consumption, churn probability… to find out the optimal discount percent (for the extent of this analysis we are not going to dig into that).

Therefore it is very important to understand the concept of cut off rate.

Cut off rate = The **churn probability threshold** above which a customer is considered **at high risk of churning** and is therefore **offered a 20% discount**.

**Why it's important:**

Choosing the right cut-off balances:

* **Saving valuable customers** (true positives)
* **Avoiding unnecessary discounts** to customers who wouldn't have churned anyway (false positives)

**The intervention strategy is considered succesfull when the difference between revenue after discount and baseline revenue isare maximized.**

**The ultimate goal would be to find out the cut off rate that maximize this revenue difference.**

Now we have to determine if the cost of giving them discount outweighs the retained revenue achieved by customers not churning out.