# Electricity DSO revenue regulation

## Background

Until recently, the European electricity system was a very stabile business with mainly organic growth. Cities expanded with an increased need for electricity, but the customers usage patterns were rather stabile. An electricity customer in the 80´s had about the same needs as a customer in the early 10´s, perhaps even a little less due to energy efficiency. However, new technology and political changes in the last year has fundamentally changes this. Distributed solar PV has transformed many customers in the local grids to prosumers demanding capacity to export their excess solar electricity in daytime. The EV boom is about to take of in many European countries with customers demanding fast charging of their new vehicles. The ongoing switch from gas heating to electric heating will further increase the need for grid capacity in many parts of Europe. All this will require grid investments on a scale unseen since the end of World War II.

The most important driver for grid investments is the model for revenue regulation of DSO´s. The revenue regulation has to secure the necessary cash flows for investments as well as the financial incentives for owning and operating a DSO in comparison to other investments. The regulation also has a large impact on the grid tariffs paid by the customers. The revenue regulation is also used to incentivise certain functions such as flexibility and security. As the environments for DSO´s differs between the member states, there is no European standard for revenue regulation.

This GEODE position paper examines the revenue regulation as a toll for grid investments and highlights several principles that will benefit the development of the next generation of European local electricity grids.

## Revenue regulation for DSO´s – the basics

As a regulated natural monopoly, the revenues for DSO´s are set by the national electricity regulator. This is usually done for a specific time period and based on the characteristics of each grid (number of customers, distance between customers, electricity usage and such). Other aspects considered is the operational costs that usually are subjected to some kind of efficiency demand. Capital costs are also considered and usually modified with quality aspects such as outages and grid losses. To this a WACC (Weighted Average Cost of Capital) is added to make grid investments comparable to other investments including profits.

The main principle of the revenue regulation models is that efficient DSO´s that can build and maintain a grid for less money that their income will get a higher profit than inefficient DSO´s with higher costs for the same service.

(a picture of this would be nice hear)

## Long time predictability

Grid investments typically has both physical and financial lifespan that stretches over several decades. The tariffs paid by customers today is financing investments made years ago. And will at the same time create the cash flow necessary for grid expansion and reinforcements. In such environment, the revenue regulation can not be changed every other year, but needs to be predictable, stabile over a very long time. This will enable the DSO to plan their investments far ahead with a stabile cashflow that is the benefit of a regulated entity.

## Enabling anticipatory investments

Before the current electrification trend, grid expansion was slower than today. Capacity could usually be secured within a reasonable time when the customer needed it. Today, the need for grid capacity grows fast. The grid in a new residential area may need to be reinforces only years after being build due to the inflow of EV´s, Solar PV and electric heating. Its is a real challenge for DSO´s today to keep investments at the same level as the customers needs.

One way to handle this challenge is to allow anticipatory investments in the revenue regulation. This means allowing investments based on a prognosis of the customers future needs rather than their current status. The income regulation of the future needs to enable anticipatory investments enabling the DSO´s to at least to some degree reinforce the grid in advance based on realistic projections. The cost for society for insufficient access to electricity is much higher than the cost for a slight overcapacity.

## Competitive WACC

The DSO business used to be a very low risk business compared to other sectors in society. It still is, but a number of risks has certainly increased in the last years. In many countries, regulation has changed often thereby reducing the DSO´s ability to plan further investments in the future. A number of costs has risen that are not specifically connected to the grid operations such as security. Electrification also means that the lifespan of a grid investment may change fast, becoming obsolete when capacity needs are increasing.

Although local electricity distribution is a regulated monopoly, it usually competes with other investments. Therefore, the DSO business needs a competitive WACC to secure the necessary financial capital.

## Higher demand for security

The demand for higher security of delivery is rising in the light on the current energy crisis in Europe. There is also in increased threat of both physical and cyberattacks to energy infrastructure. As secure and stabile electricity grid are a national interest, it is essential that that the income regulation allows sufficient investments in security measures. In some member states regulations, costs for security are subjected to yearly efficiency reductions, which is counterproductive when security is in high demand.

# Incentivise innovation

Focusing on low grid tariffs for the customer, many income regulation models punish DSO´s for innovation such as pilot projects. Being close to the customer and the only entity on the electricity market with a permanent customer relation, it is necessary for DSO´s to engage in innovation. Income regulation models must allow that to a fair degree.

Traditionally, cables have been the solution for bringing enough electricity to the customer. However, today there are several alternatives to secure sufficient capacity. Local flex markets, storage, load-sharing and conditional connections are competing ways of solving the electricity needs for our customers. A smart income regulation must stimulate the most efficient solution regardless of technology.

# Reward efficiency

A regulated entity such as a DSO works in an environment without competition. Therefore, an efficient revenue regulation must have adequate incentives for efficiency. DSO´s with low outage levels & low distribution losses in comparison with others must be rewarded.

*Idea:*

*Maybe we can find examples from varius member states on the points above? Some countries that promote innovation such as Norway, the Swedish model for promoting less outages etc. We don´t have to go into detail, just cover them in brief…..*