EOX: SAVING ENERGY IS PART OF THE RIDE

Elevators represent only 2-5% of the energy used in a typical building, so their energy consumption has traditionally not been a major concern for designers or owners.

However, new energy efficiency regulations in buildings – driven by the European commitment to reducing greenhouse gases as well as the current energy crisis – have resulted in new thinking about how to increase energy efficiency in every aspect of the built environment.

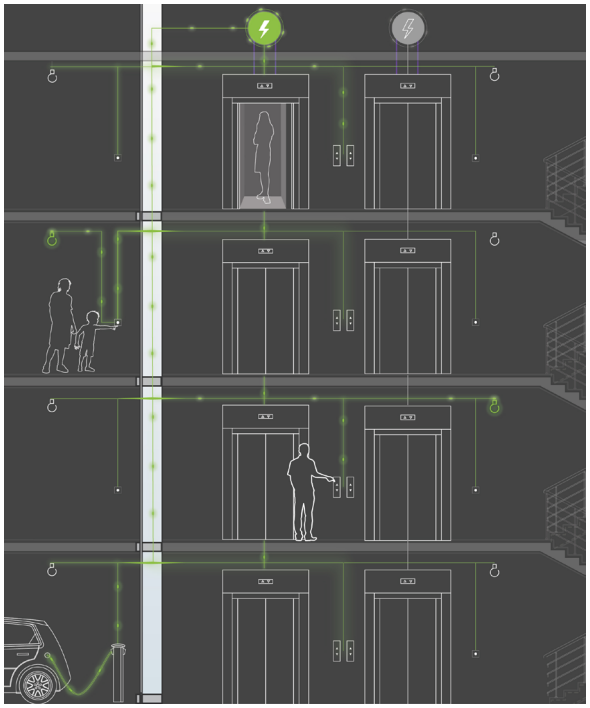
EOX is a result of this new thinking. Find out how TK Elevator's EOX – a fusion of the latest energy-saving and digital technologies – adds value to your buildings by contributing to energy efficiency and the reduction of your carbon footprint.

Regenerative drive

How does the EOX regenerative drive work?

When an elevator is travelling upwards with a light load, or downwards with a full load, the system must "brake" to balance the weight of the counterweight.

This braking generates energy in the form of heat. An elevator with a conventional, non-regenerative drive therefore includes resistors to continuously dissipate this energy. And so the energy is simply wasted.



EOX, on the other hand, uses a regenerative drive to convert that braking energy into electrical energy.

This is transferred to the power source via the same electrical wiring, and then fed into the building's electrical network.

From there, it is distributed to the various consumption points working at that moment in the building: to power another elevator, to pump water to a top-floor shower, to light up a staircase, or to open a garage door.

Any energy not consumed within general services of the building is simply returned to the grid.

In addition – and just like today's electric vehicles – EOX visually informs passengers when it is regenerating electricity by means of an illustrative icon on the display of the cabin operating panel.

How much electrical energy is regenerated – and saved?

On average, the high efficiency of the EOX regenerative drive (over 95% efficiency) **regenerates up to 43% of the elevator's power.** In taller buildings, even more energy can be recovered.

Of course, the amount of energy generated depends on the elevator configuration – number of passengers, speed, travel height, etc. – traffic and usage patterns, and the efficiency parameters of the system. But the high efficiency of the EOX regenerative unit (over 95% efficiency) means it normally consumes much less energy than a non-regenerative drive for any equivalent elevator movement.

As a result, the regenerative unit has a significant impact on energy costs by directly affecting the two defining factors of any electrical energy bill:

- The peak starting power (kilovolt-amperes or kVA) – which defines the contractual minimum electrical power supplied by the power company – is independent of the frequency of use of the elevator and is responsible for the fixed monthly costs.
- The power consumption (kilowatt-hours or kWh) is reflected in the variable costs of the electricity bill and varies according to the use of each elevator.

Building and building´s owners considerations

The installation of an elevator with a regenerative drive requires no modification of the planned building connection, nor any additional wiring. The building's power supply and wiring have already been calculated on the basis of the large-scale estimation of the building's electrical needs, where the energy consumption of the elevator has already been taken into account.

Owners can even request that the power company compensate them for the energy that is returned to the grid. This normally involves changing to a bi-directional electricity meter (if that is not already in place), programming the new meter, and signing a new electricity contract detailing consumption and electricity returns.

It should be noted that the compensation price per kW is usually lower than the consumption price per kW, so selling surplus energy back to the power company is usually only of interest if the building has a lot of it to sell, e.g. through additional power generation equipment such as solar panels.

Your advantage

- **Energy efficiency.** The EOX regenerative drive unit saves energy by converting some of the energy it generates during operation into electrical energy that can be reused.
- **Reduced operational costs.** With its VVVF standard regenerative unit, EOX requires less electricity to operate, lowering monthly operating costs.
- **Reduced environmental impact.** The energy savings from the regenerative drive unit mean less electricity is needed to move an EOX elevator. This reduces greenhouse gas emissions and other environmental impacts associated with electricity generation.
- **Smoother ride.** The regenerative drive unit also helps to regulate the speed of the elevator and its braking. The resulting stops and starts are softer, and deliver a more comfortable and reliable ride for passengers.
- **Real-life energy consumption transparency.** Through the online customer portal, EOX owners can create a detailed energy consumption report for each elevator on a daily, monthly or yearly basis, including statistics on the energy recuperated through the regenerative drive.

A regenerative drive unit makes an elevator more energy-efficient, cost-effective, and environmentally friendly, while also improving its performance and comfort. It's a standard feature on all EOX elevators.

Stand-by mode and sleep mode

The state-of-the-art EOX in-jamb controller has been specifically designed to incorporate enhanced energy-saving operating features and operating modes, such as stand-by, sleep and the unique eco mode. Discover how these standard EOX features work - and the benefits they provide.

If it is not needed, switch it off!

Almost all elevators – especially those in residential buildings – stand still much longer than they are moving. And we can all remember countless examples of elevators that have halogen car lighting or landing fixtures that stay on all night long – even when the equipment is not in use. So reducing idle energy consumption is a very simple, efficient and cost-effective way to drastically reduce the total energy consumption and costs of an elevator.

Early efforts in this direction began with the use of energy-efficient LED lighting technology. LED lighting can last 10 times longer and is up to 80 % more energy efficient than halogen lighting. Nautrally, EOX comes equipped with LED lighting – as standard – for all lighting devices in the shaft, cabin (ceiling, push-buttons, multimedia display, etc.) and landing.

Automation, smart technologies and advanced software developments further ensure that electricity is not wasted when the elevator is not in use.

How do stand-by and sleep modes work on EOX?

The **stand-by** function in EOX is fully initiated after 5 minutes of inactivity (no call, doors or car movement):

- After 30 seconds of inactivity, the LED cabin lighting and the car fan are switched off.
- After 5 minutes of inactivity, the regenerative drive, the 7" multimedia cabin display, as well as electronic devices such as the landing fixtures, car boards and cabin door operating board are switched off.

The **sleep mode** function in EOX kicks in after 30 min. of inactivity, and almost completely switches off all the electronic boards, leaving active only those necessary for a correct and quick "wake-up" of the elevator in case it is called.

Both stand-by and sleep modes are standard features in EOX.

Your advantage

- Environmentally friendly options
- Significant energy and cost savings
- Automated, default options with local adjustments possibility
- Extended lifespan of electrical components
- Usage transparency through customer portal

Eco-mode

Traveling time perception and energy-efficient operation

How we perceive waiting and travel time in an elevator varies according to the time of day and how much of a hurry we are in. Leaving home early in the morning and rushing to catch a train is not the same as calling an elevator for a leisurely Sunday morning walk.

What if a little more waiting or travel time would save energy? Wouldn't more energy-efficient operations be worth that? Performance – even high performance – is always partially based on what we believe we need to make life better.

At TK Elevator we constantly strive to provide users with the best elevator performance at all times. What that means varies with the needs of each application, but is always consistent with our commitment to sustainability. We deliver efficient mobility solutions and give users a greater ability to use them in a more efficient way.

Unique energy-saving feature in EOX

The digitally native EOX "learns" traffic patterns in the building through historical weekly data, and recognises the times where the elevator is less used. This allows it to adjust its speed and acceleration accordingly.

During off-peak hours, the elevator speed and acceleration are reduced to 80% of nominal values. These can be further adjusted according to preference, and can even be set to define a call threshold for activation. Active eco-mode status is highlighted for passengers on the cabin display.

The eco-mode is a standard and unique feature on EOX. It comes activated according to its factory settings, and these can be easily customised locally by TK Elevator service technicians.

Your advantage

- Unique environmentally friendly option in the low-rise segment
- Significant energy and cost savings
- Default settings with local adjustment possibility
- Extended lifespan of mechanical and electrical components
- Usage transparency through customer portal

EOX TRULY SAVES ENERGY

Eco-efficiency and technology can go hand in hand, and EOX proves it. EOX is lighter and packed with energy-saving features such as a regenerative drive, LED lighting devices, stand-by and sleep modes, as well as its innovative eco-mode. All together EOX reduces energy consumption by up to 28% compared with non-regenerative systems - and by 75% vs. geared traction systems.

YEARLY ENERGY CONSUMPTION AND ASSOCIATED SAVINGS						
		EOX ■ gearless traction ■ regenerative drive ■ stand-by & sleep mode ■ eco-mode	**synergy 100** ■ gearless traction ■ non-regenerative drive ■ sleep mode	**synergy 100** ■ gearless traction ■ non-regenerative drive	**Hydraulic** ■ non-regenerative drive	**Geared traction** ■ non-regenerative drive
Yearly energy consumption	(kWh/Y)	520 kWh/Y	684 kWh/Y	720 kWh/Y	1195 kWh/Y	1956 kWh/Y
Cost* of energy	(€/Year)	70 €	92 €	97 €	161 €	264 €

* Cost of energy considered 0.135 €/kWh
Elevator configuration: 630 kg, 8 persons, 5 stops, 12 m travel height, 125 trips per day (usage category 2)

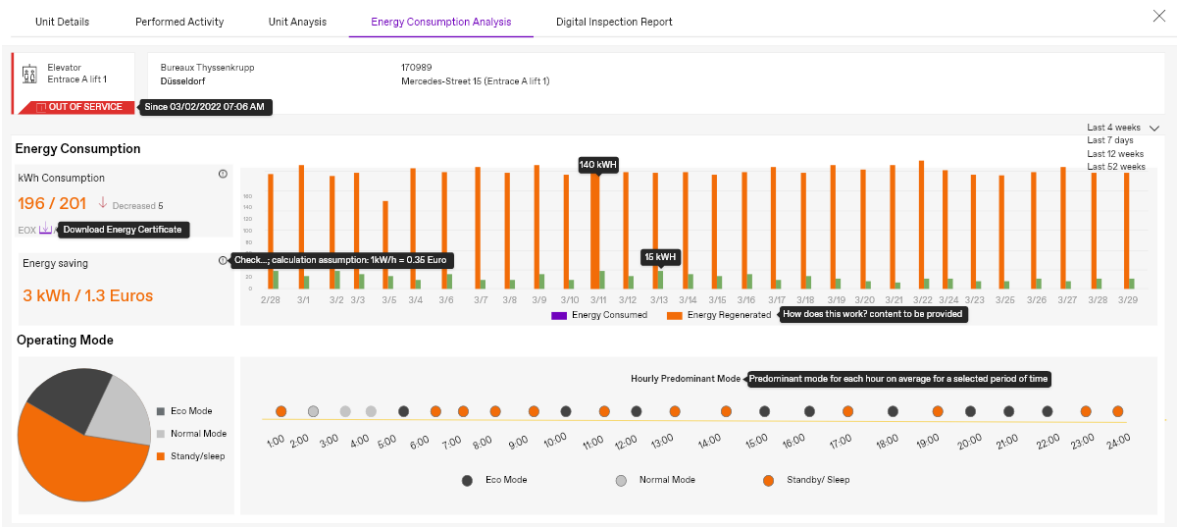
With EOX, overall building operating costs are reduced, resulting in significant annual savings for building owners and tenants during the entire life cycle of the elevator.

CUSTOMER PORTAL

The TK Elevator customer portal is the heart of EOX when it comes to managing and tracking your elevator´s performance. Through this online customer portal, property managers and owners can track the real-life performance of the energy-saving functions of their EOX elevator, and obtain full transparency on topics such as:

- Energy consumption - up-to-date analysis shows how much energy has been consumed and recovered thanks to the regenerative drive: live, daily, weekly, etc.; both in kWh and local currency.
- How long the elevator has been running in different operating modes (normal mode / eco-mode / stand-by & sleep-mode) during a specified period of time

In addition, it serves as a single point of entry for all of TK Elevator's digital products and services.



Energy consumption analysis overview of an EOX elevator via TK Elevator´s customer portal.

Contact us: