

# KONE Eco-efficient™ solutions

## Escalators

KONE is the pioneer of eco-efficiency in the elevator and escalator industry. For several decades, KONE has led the way in creating innovative solutions that help to significantly cut the energy consumption of buildings.

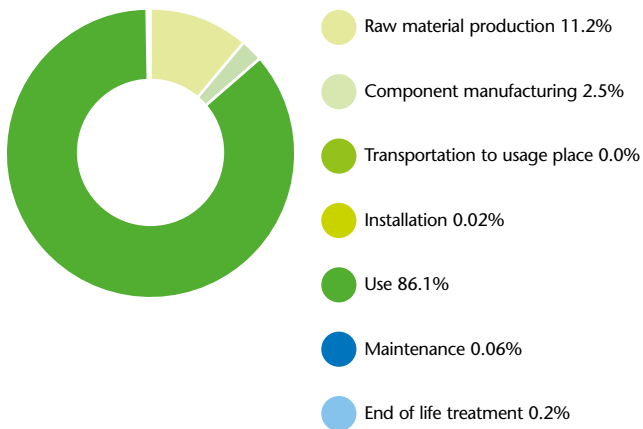
Lifecycle assessments of KONE escalators show that the greatest environmental impact of an escalator stems from the electricity used in the operation of the equipment. Therefore, the key focus area for KONE is to systematically reduce the energy consumption of its escalator features with each new product release.

Escalators consist mostly of metals and about 80% of this material can be recycled.

### KONE eco-efficiency milestones

- 1993: The energy efficient KONE Eco3000™ planetary gear for escalators is introduced.
- 2004: The KONE EcoMod™ solution is launched, enabling escalator modernization without removing the truss, saving construction time and materials.
- 2007: KONE InnoTrack™ autowalk is launched, equipped with the first energy-efficient gearless drive in an autowalk.
- 2009: The new efficient drive, located outside the step band, is launched for KONE escalators & autowalks.

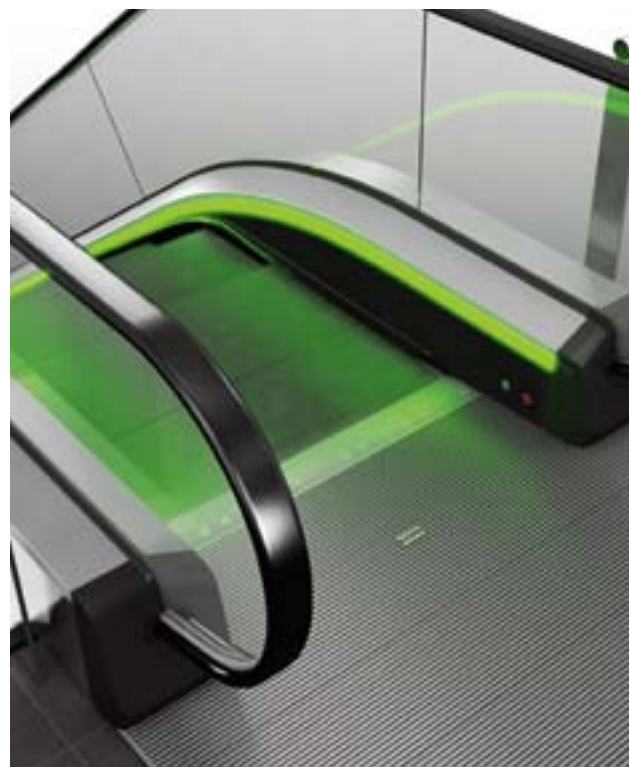
### KONE escalator lifecycle assessment



### Supporting green building through energy measurements and calculations

KONE has developed tools to estimate the energy consumption of customer-specific solutions in the design phase of each project. These tools are especially helpful for customers working on green building certified (e.g. LEED, BREEAM) projects.

KONE follows the latest green building trends through its involvement in green building associations around the world.



Energy-efficient continuous LED skirt lighting saves 80% energy compared with conventional lighting

\* The Life Cycle Assessment is based on an estimated lifetime of 15 years for the reference escalator TravelMaster™ 110 operating 14 hours /day, 6 days/week and 52 weeks/year with an equivalent step load of 25 kg.

# Four ways to make an escalator eco-efficient

The eco-efficiency of an escalator can be improved by utilizing eco-efficient technologies and by operating the escalator in a more efficient way.

## 1. Lubrication-free step chain

- Permanent greased and sealed chain links do not require extra lubrication with oil
- Reduced wear of chain links and bushings
- Reduced fire risk
- No oil consumption; the truss stays oil-free
- Average oil savings with commercial escalators 1-2 liters/month, Infrastructure escalators 5 liters/month

## 2. Regenerative solution

- Solutions for regeneration of power from the downward running of the passenger loaded escalator are available where an inverter is installed.
- Replaces brake resistors, which generate heat
- Technology for extensively used escalators
- Energy savings: during peak traffic times, 7100 kWh/year<sup>1)</sup>
- Carbon footprint reduction: 3400 kg CO<sub>2</sub>/year<sup>2)</sup>

## 3. Eco-efficient operation

### Stop & Go operation

- The escalator stops running when not in use, almost no power consumption when escalator is stopped
- Can be combined with Star/Delta energy saving
- Recommended for low traffic or with long intervals of no passengers
- Energy savings: up to 50% depending on passenger traffic, load, motor and drive, 2760 kWh/year<sup>1)</sup>
- Carbon footprint reduction: 1340 kg CO<sub>2</sub>/year<sup>2)</sup>

### Stand-by speed (by inverter control)

- Escalator runs at reduced speed with no passengers on the step band (changing from a nominal speed of 0.5 m/s to a stand-by speed of 0.2 m/s)
- Recommended for medium traffic or several peak and non-peak intervals
- Can be combined with Stop & Go, which provides additional energy savings
- Energy savings: up to 40% depending on passenger traffic, load, motor and drive, 2560 kWh/year<sup>1)</sup>
- Carbon footprint reduction: 1240 kg CO<sub>2</sub>/year<sup>2)</sup>

## Star/Delta energy saving

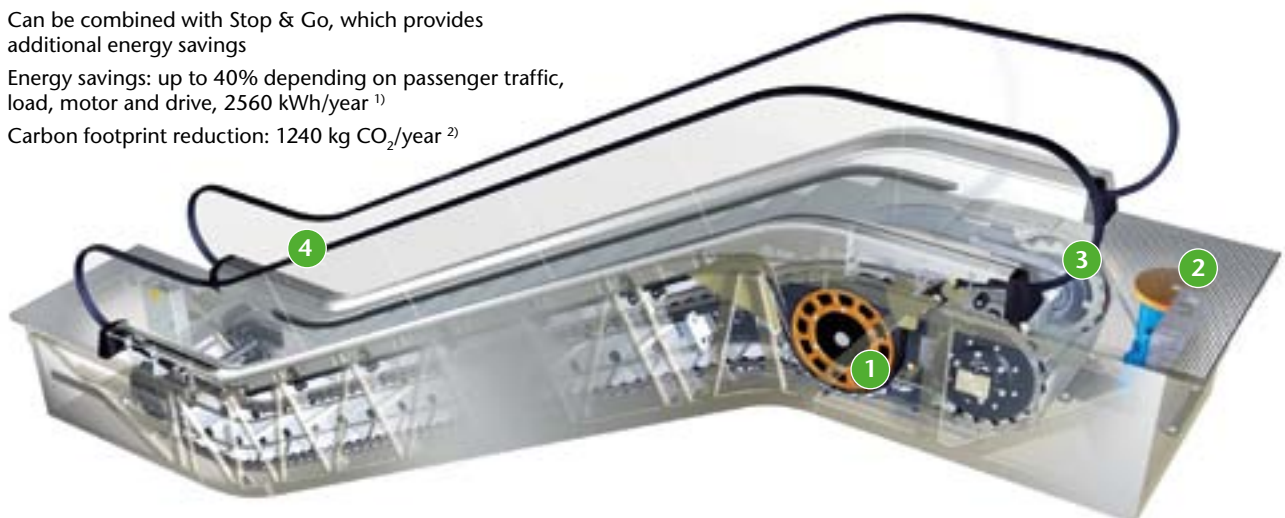
- A conventional energy saving feature as basic option
- When there is low escalator traffic the motor is switched to Star-operation increasing the efficiency of the motor when no or few passengers are using the escalator. When the number of passengers increases the escalator the motor reverts to Delta-operation
- Recommended for low load situations
- Energy savings: up to 25% depending on passenger load, motor and drive, 1900 kWh/year<sup>1)</sup>
- Carbon footprint reduction: 930 kg CO<sub>2</sub>/year<sup>2)</sup>

## Traffic dependent operation

- The escalator is able to run automatically in the direction from where the first passenger is approaching
- When not in use the escalator is stopped
- Recommended for traffic conditions with low traffic or long intervals of no passengers
- The installation of a second escalator is not necessary as the solution enables automatic dual operation

## 4. LED lighting

- Significant energy savings: consumption only 2-10 W/m compared to 60 W/m of a fluorescent tube lighting
- Extended service life – up to 50,000 hours
- Energy savings: 80%, 1960 kWh/year compared with conventional lights
- Carbon footprint reduction: up to 950 kg CO<sub>2</sub>/year<sup>2)</sup> depending on application



<sup>1)</sup> Values are based on theoretical calculations concerning a reference escalator: 7.5 kW/worm gear/1000 mm step width /4.5 m vertical rise/ 30°/0.5 m/s / continuous mode/100 kg nominal step load/ load profile: 2h–0%, 8h–25%, 2.5 h–50%, 1 h–75%, 0.5 h–100% / operation time: 14 h/day, 6 days/week, 2 weeks/year

<sup>2)</sup> Emission coefficient equal to 485 g CO<sub>2</sub>/kWh based on the EU electrical energy mix

<sup>3)</sup> This is a maximum value for downwards running escalator only. The effective energy saving depends on the passenger traffic and load.

For more information go to [KONE.com](http://KONE.com)