GAINING
EFFICIENCIES

THE RIGHT DIRECTION

REDUCING
WASTE

ThyssenKrupp

GOING UP OR DOWN?

ThyssenKrupp

"AT THYSSENKRUPP ELEVATOR, the strength of our business is absolutely inseparable from the well-being of the planet and all who share it.

"Consequently, we're doing everything in our power to reach the highest levels of efficiency and the lowest possible levels of waste through sustainable products and business practices.

"Our vision is simple. Waste nothing."

A VIEW FROM THE TOP

BARRY PLETCH, CEO, THYSSENKRUPP ELEVATOR AMERICAS

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FROM THE GROUND UP

AT THYSSENKRUPP ELEVATOR, our reputation for manufacturing, installing and maintaining elevator and escalator products has risen steadily to the top as one of the leading elevator companies operating in North America.

From the service technician working on an elevator top, right up to the executive board articulating our sustainability story, we're ready to take it to the next level. In this day and age, "quality and reliability" simply aren't good enough. We need to use our resources more efficiently, reduce waste and become better global stewards.

Our first order of business was to conduct a series of Life Cycle Assessment (LCA) studies on elevators that are representative of our entire product line, so we could determine the environmental impact of each elevator type, from material extraction throughout all stages of the life cycle. With this added knowledge, we can review current projects and practices, consider future decisions, and capitalize on potential sustainability opportunities across every phase of our business.

To achieve this goal, a core team was appointed to audit, assess and address every facet of our business where we might gain efficiencies and reduce environmental impacts. Together, these LCA studies form the foundation for this Environmental Product Declaration.

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What's An Environmental Product Declaration?

Environmental Product Declarations or "EPDs" are globally recognized and verified information based on LCA data from studies according to the ISO 14040 standard.

Verified by a third party, this EPD lists all the ingredients and environmental impacts of a representative sampling of our products throughout their life cycles, including energy and material consumption, waste generation and emissions.

This EPD is a self-declaration developed in conformance with the ISO 14021 standard for Product Self-Declarations, resulting from a Life Cycle Assessment conducted by ThyssenKrupp Elevator.

A self-declaration is used because a "true" EPD in conformance with the ISO 14025 standard is not possible due to the absence of Product Category Rules (PCR) for elevators to certify against. The term EPD has been used to eliminate confusion with respect to similar documents published by other elevator manufacturers, and will be revised when PCRs for elevator systems are published.

The LCA was conducted in conformance with the ISO 14040 standard and was reviewed by a third-party panel.

MOVING FORWARD BY PULLING OUT ALL THE STOPS

What's a Life Cycle Assessment?

Life Cycle Assessment (LCA) studies involve the collection, assessment and interpretation of data from an environmental perspective over a product's life cycle (production, use and end-of-life).

Studies can evaluate:

- The entire product life cycle, often referred to as cradle-to-grave or cradle-to-cradle studies, OR
- Parts of a product life cycle, referred to as cradle-to-gate or gate-to-gate studies.

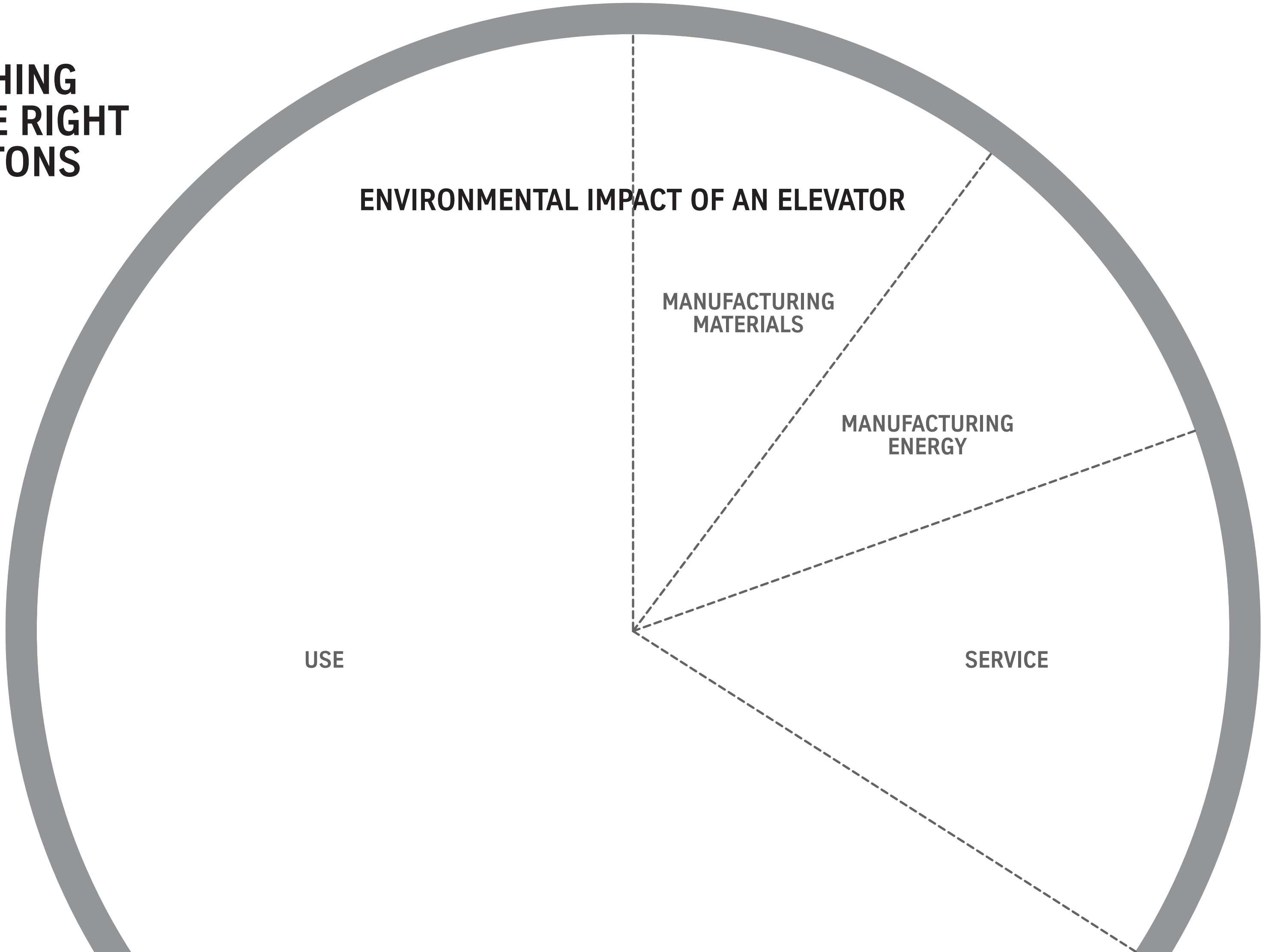
To move us in the right direction, an LCA was conducted on seven different ThyssenKrupp Elevators to create the data contained in this environmental profile, which encompasses the ThyssenKrupp Elevator cradle-to-cradle product life cycle from raw materials supply and upstream materials processing to the installation, operation and servicing of the elevators over their lifetime.

It also includes the end-of-life of the elevator, as 70% of elevator components are commonly recycled at end-of-life.

The studies were conducted according to ISO 14040 standards which prescribe methodological steps for conducting an LCA. With this information in hand, we can optimize our efficiencies and minimize our waste.

PUSHING ALL THE RIGHT BUTTONS

ENVIRONMENTAL IMPACT OF AN ELEVATOR



Primary Findings

- At a low number of stops (2-3), the hydraulic elevator is equivalent or slightly superior to the Machine Room-Less (MRL).
- At a medium number of stops (6), the MRL is superior to the hydraulic elevator.
- At a high number of stops (12), the MRL is superior to the geared traction elevator.

The data presented in this figure represents a simple average of all life cycle indicators studied across all functional units included in the LCA. It has been prepared for the sole purpose of helping a non-technical reader understand the significance of the results of this study.

AN ELEVATOR'S LIFE STORY

STAGE ONE
UPSTREAM MATERIALS PROCESSING & TRANSPORTATION

STAGE TWO
MANUFACTURING (STEEL PROCESSING & FABRICATION)

STAGE THREE
DISTRIBUTION & INSTALLATION

STAGE FOUR
OPERATION (ELECTRICITY USAGE)

STAGE FIVE
SERVICING (VEHICLE USAGE)

STAGE SIX
END-OF-LIFE (COLLECTION, RECYCLING, ETC.)

THE LIFE CYCLE OF AN ELEVATOR

Each ThyssenKrupp Elevator model has a unique story to tell while it passes through the six functional phases of its life cycle:

1) Upstream Materials Processing and Transportation to Production Facilities, 2) Manufacturing, 3) Distribution and Installation, 4) Operation, 5) Servicing and 6) End-of-Life.

All of these stages have a net environmental impact.

AN ELEVATOR'S LIFE STORY

STAGE ONE
UPSTREAM MATERIALS PROCESSING & TRANSPORTATION

STAGE TWO
MANUFACTURING (STEEL PROCESSING & FABRICATION)

STAGE THREE
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STAGE FOUR
OPERATION (ELECTRICITY USAGE)

STAGE FIVE
SERVICING (VEHICLE USAGE)

STAGE SIX
END-OF-LIFE (COLLECTION, RECYCLING, ETC.)

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THE LIFE CYCLE OF AN ELEVATOR

Phase 1: Upstream Materials Processing and Transportation to Production Facilities

The earliest stage of the life cycle involves the extraction of raw materials used in the manufacturing process, including the energy required to extract, process and then transport them to our manufacturing facility.

This includes a wide range of key components supplied by ThyssenKrupp sub-plants and vendors.

Phase 2: Manufacturing

During manufacturing and assembly, energy consumption and common by-products like emissions and material waste are measured.

Elevator manufacturing processes were modeled based on the Bill of Materials identifying relevant construction materials, masses and processes used in elevator manufacture.

AN ELEVATOR'S LIFE STORY

STAGE ONE
UPSTREAM MATERIALS PROCESSING & TRANSPORTATION

STAGE TWO
MANUFACTURING (STEEL PROCESSING & FABRICATION)

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Phase 3: Distribution and Installation

Distribution

The distribution stage covers transporting the elevator and related components to the installation site. The energy impact during this stage is calculated by measuring the energy consumption at the elevator distribution centers and the mileage accrued along the transportation route to the installation site.

These gate-to-site impacts are based on the annual energy consumption at the distribution centers and the number of landings recorded for each functional unit, weighted with the annual production figures for that unit.

Installation

Elevator installation is typically associated with unpacking and assembling the cab, hoistway components, landing appurtenances and fascia at the installation site. Waste generated by the disposal of packaging materials was considered in this stage.

However, most of the work relies on manual labor with rechargeable power tools, use of the energy grid, generators and, in some cases, cranes and rigging.

Because the net impact of energy for this stage is minimal, energy consumption was not included in this study.

STAGE SIX
END-OF-LIFE (COLLECTION, RECYCLING, ETC.)

STAGE THREE
DISTRIBUTION & INSTALLATION

STAGE FIVE
SERVICING (VEHICLE USAGE)

STAGE FOUR
OPERATION (ELECTRICITY USAGE)

AN ELEVATOR'S LIFE STORY

TURN TO
PAGE 28
FOR
ELEVATOR SERVICE
SCHEDULE
ASSUMPTIONS
CHART

STAGE ONE
UPSTREAM MATERIALS PROCESSING & TRANSPORTATION

STAGE TWO
MANUFACTURING (STEEL PROCESSING & FABRICATION)

STAGE THREE
DISTRIBUTION & INSTALLATION

STAGE FOUR
OPERATION (ELECTRICITY USAGE)

STAGE FIVE
SERVICING (VEHICLE USAGE)

STAGE SIX
END-OF-LIFE (COLLECTION, RECYCLING, ETC.)

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Phase 4: Operation

During the elevator's lifetime, there are two fundamental environmental impacts: 1) the energy consumption required for vertical transportation — that is, the actual operation of the elevator — and 2) materials and transportation involved in servicing the elevator.

Energy consumption during the operational stage has been estimated using a version of ELEVATE software, designed to evaluate the average "wait time" and "travel time" based on the traffic pattern of a building's population. ELEVATE is a third-party tool that is recognized by industry professionals as one of the most comprehensive traffic modeling tools available in the industry.

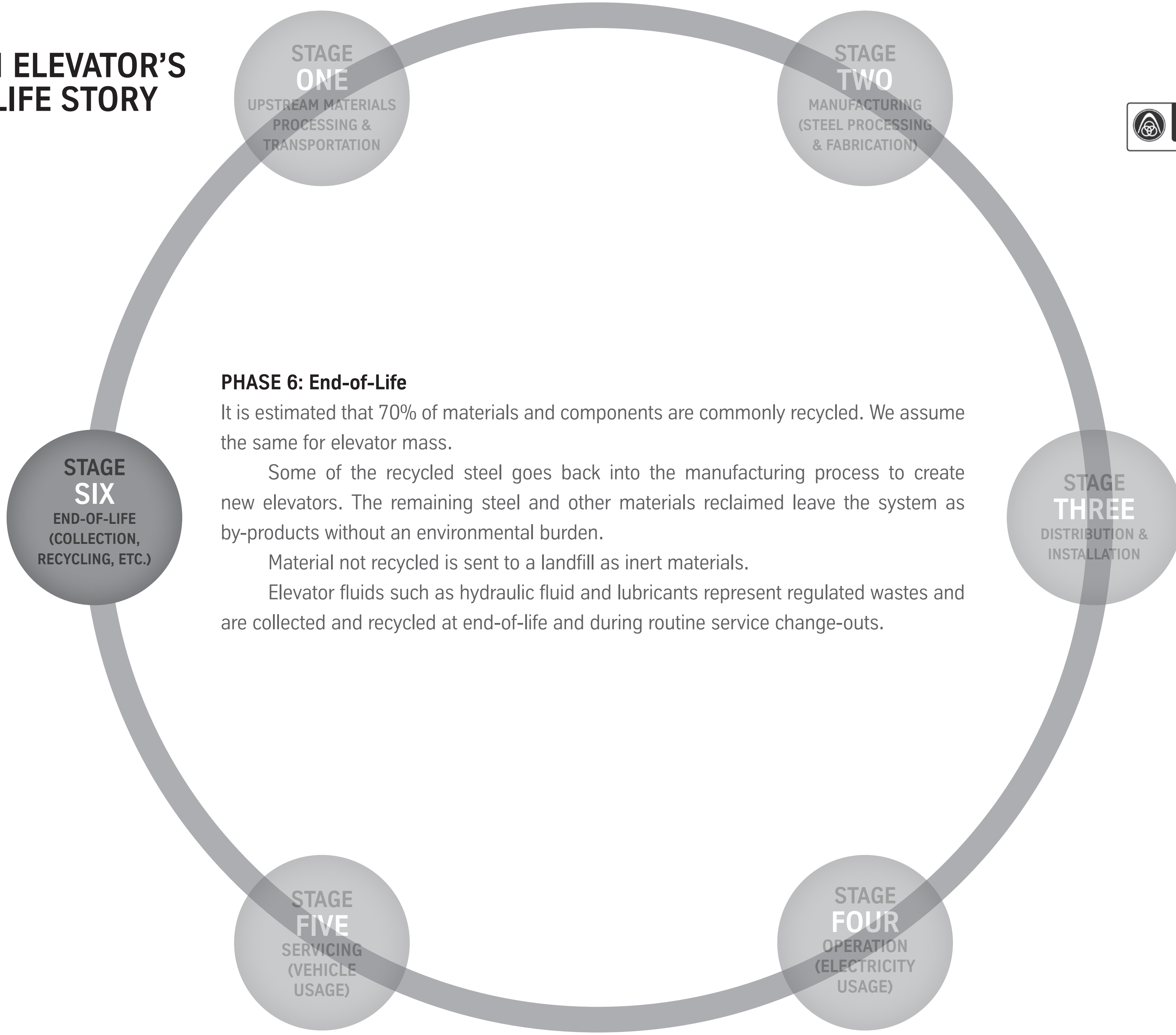
Servicing assumed a comprehensive list of replacement parts and materials, technician transportation modes, and elevator mechanical and hydraulic oils that are replenished on a regular basis.

Phase 5: Servicing

There are three types of service an elevator can encounter throughout its lifetime: 1) routine maintenance, 2) non-routine maintenance or "call-backs" and 3) modernization.

The service schedule was developed to include these three modes of maintenance based on reasonably expected activities for that type of elevator throughout the course of its operation.

AN ELEVATOR'S LIFE STORY



PHASE 6: End-of-Life

It is estimated that 70% of materials and components are commonly recycled. We assume the same for elevator mass.

Some of the recycled steel goes back into the manufacturing process to create new elevators. The remaining steel and other materials reclaimed leave the system as by-products without an environmental burden.

Material not recycled is sent to a landfill as inert materials.

Elevator fluids such as hydraulic fluid and lubricants represent regulated wastes and are collected and recycled at end-of-life and during routine service change-outs.

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OUR UNITS OF MEASUREMENT

ASSESSED UNITS.

To ascertain the performance of ThyssenKrupp Elevators across a variety of applications, this Life Cycle Assessment analyzes the following functional units to determine the immediate and long-term impact on the environment:

2-3 STOP. Two/Three-stop elevators:
- Hydraulic (without hole)
- Synergy Machine Room-Less (MRL)

6 STOP. Six-stop elevators:
- Hydraulic (with hole)
- Synergy Machine-Room-Less (MRL)

12 STOP. Twelve-stop elevators:
- Geared Traction Drive
- Synergy Machine Room-Less (MRL)

30 STOP. Thirty-stop elevators:
- Gearless Traction Drive

The analyses and findings from this Environmental Product Declaration address only ThyssenKrupp Elevator products and should not be compared to those made by other manufacturers primarily due to the system boundaries.

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ASSESSMENT SUMMARY

After collecting and analyzing data for each functional unit, here are the overall results of the study.

This approach is not intended to draw comparisons between the functional units, and such comparisons should not be inferred due to potentially extreme differences in traffic patterns, energy consumption, materials, and other factors related to the service life of the equipment.

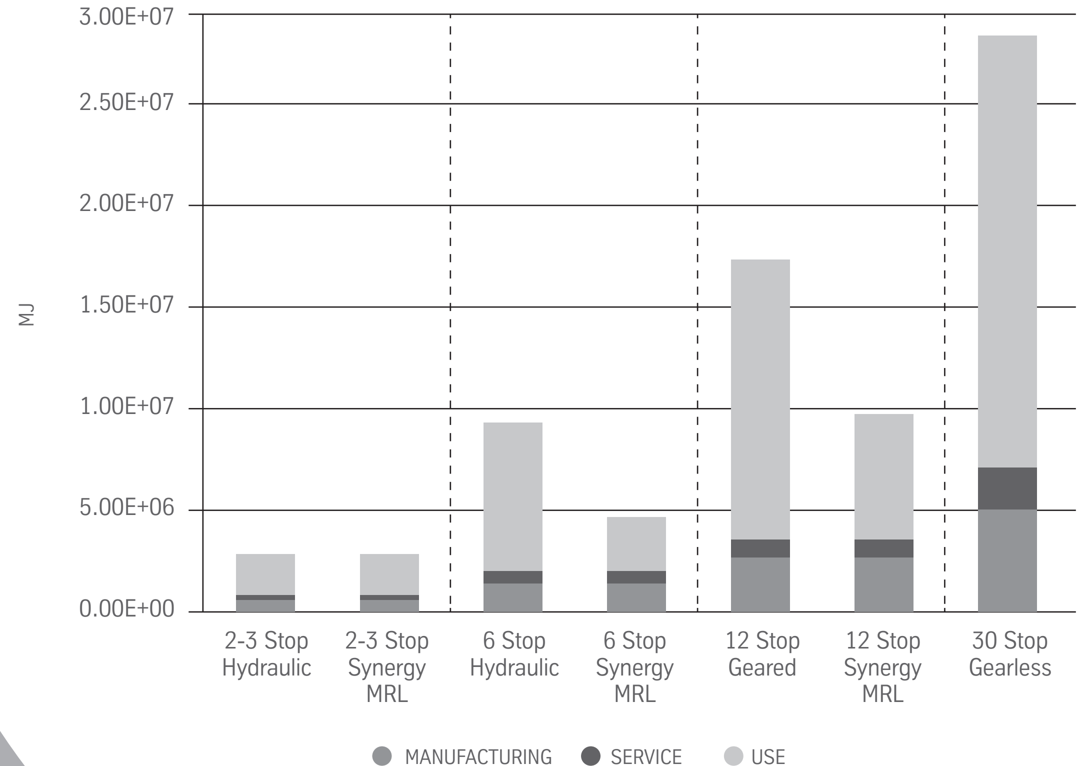
The information in these charts is intended for comparison of drive types for elevators with a similar number of stops only.

A RUNDOWN ON THE IMPACT OF GOING UP AND DOWN

TURN TO **PAGE 29** FOR PRIMARY ENERGY DEMAND DESCRIPTION

ThyssenKrupp

PRIMARY ENERGY DEMAND

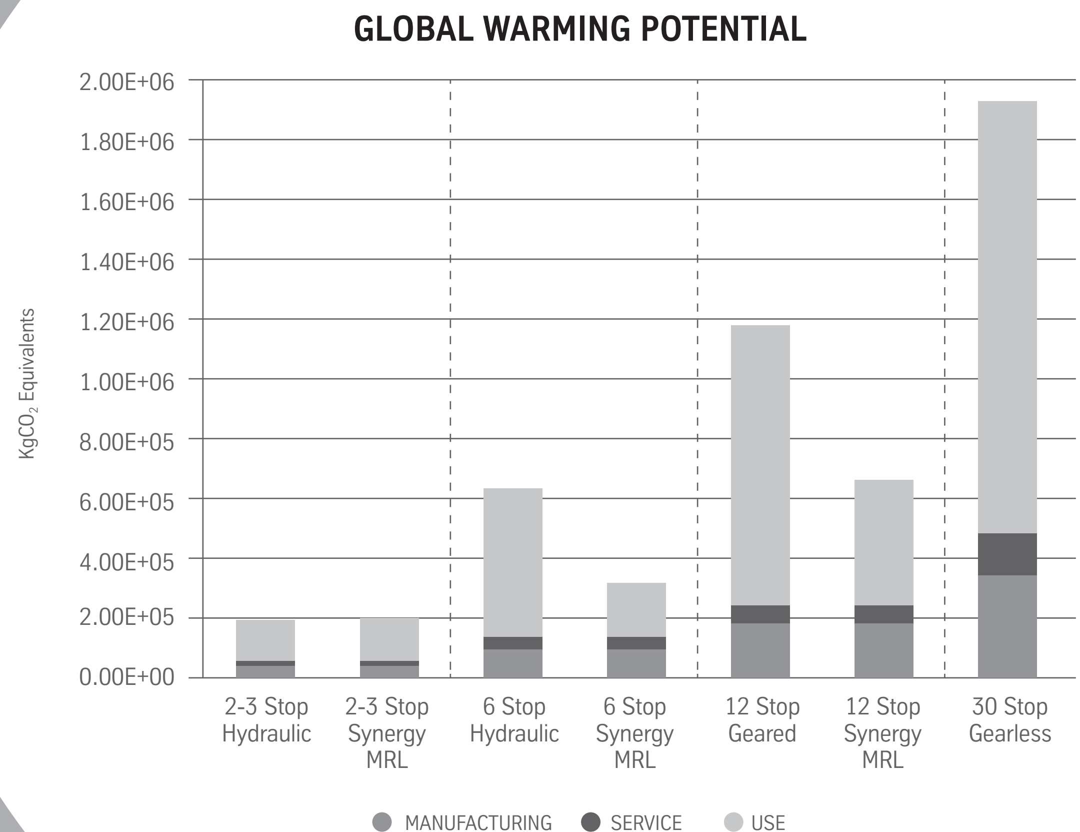


Note: the information in the charts above is intended for comparison of drive types for elevators with a similar number of stops only. The different numbers of landings, while shown in one figure for convenience, should not be compared because of differences in the underlying assumptions in the LCA model (e.g., a 6-stop elevator is not the same as three 2-stop elevators).

A RUNDOWN ON THE IMPACT OF GOING UP AND DOWN

TURN TO
PAGE 30
FOR
GLOBAL WARMING
POTENTIAL
DESCRIPTION

ThyssenKrupp



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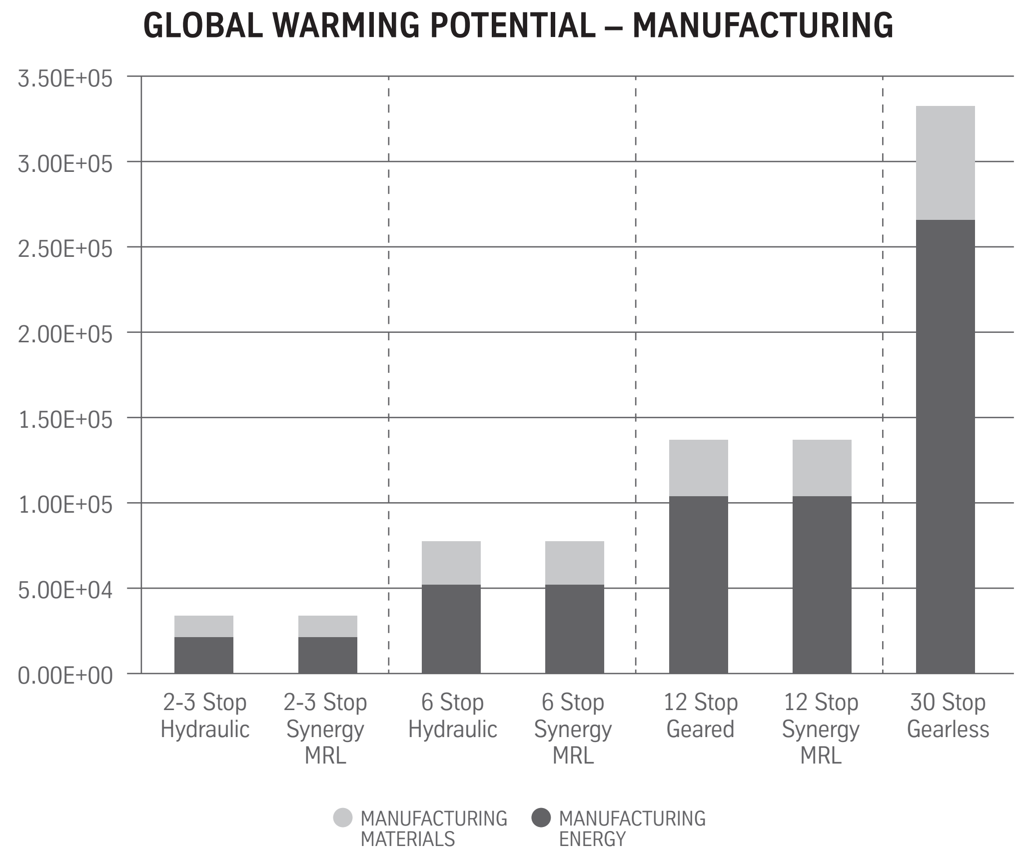
A RUNDOWN ON THE IMPACT OF GOING UP AND DOWN

TURN TO PAGE 31 FOR GLOBAL WARMING POTENTIAL MANUFACTURING DESCRIPTION



Note: the information in the charts above is intended for comparison of drive types for elevators with a similar number of stops only. The different numbers of landings, while shown in one figure for convenience, should not be compared because of differences in the underlying assumptions in the LCA model (e.g., a 6-stop elevator is not the same as three 2-stop elevators).

A RUNDOWN ON THE IMPACT OF GOING UP AND DOWN

TURN TO
PAGE 32
FOR GLOBAL WARMING POTENTIAL SERVICE DESCRIPTION

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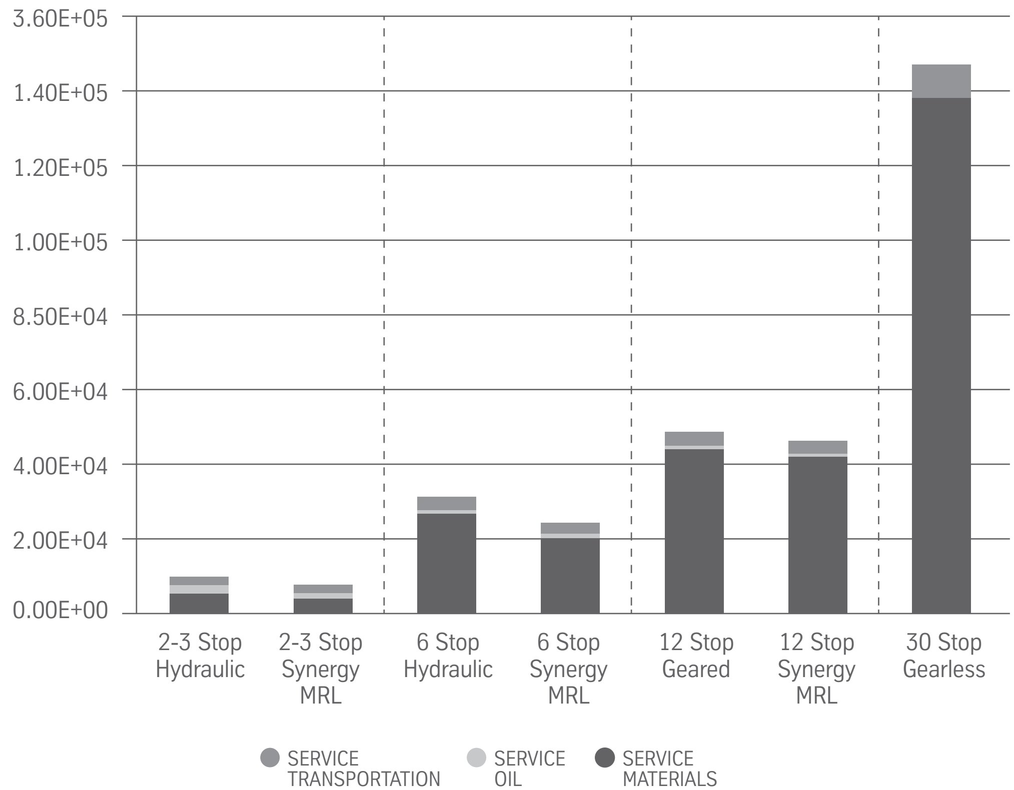
GLOBAL WARMING POTENTIAL – SERVICE



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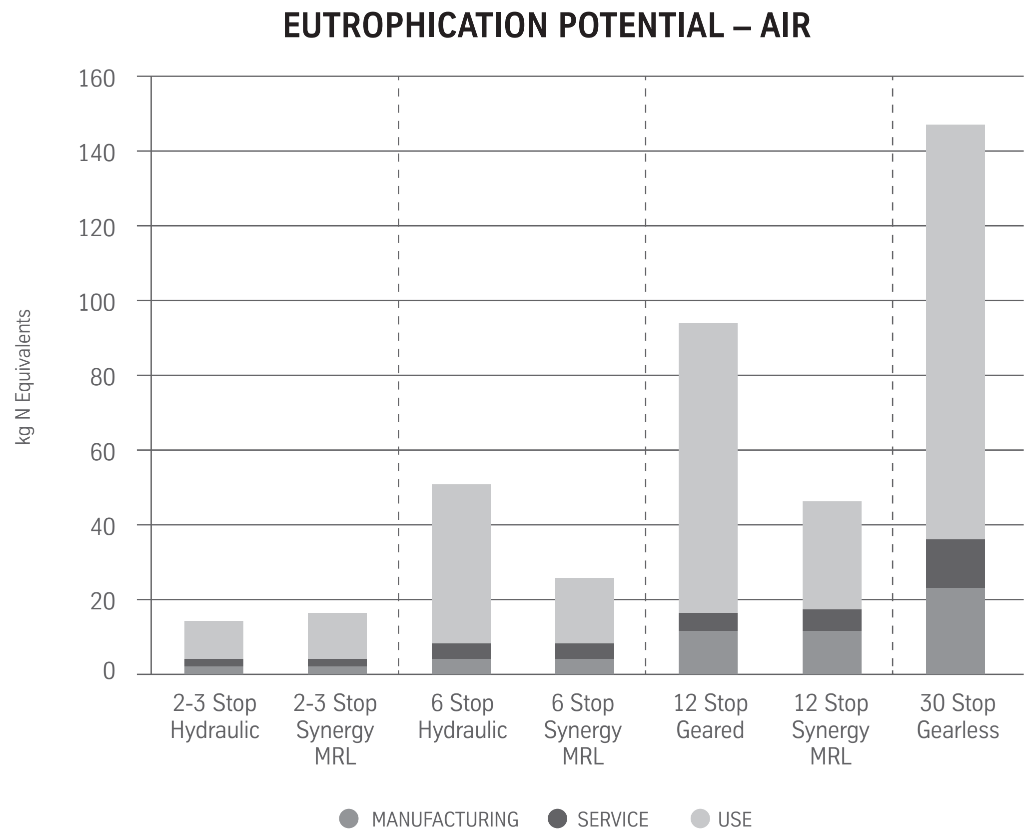
A RUNDOWN ON THE IMPACT OF GOING UP AND DOWN

TURN TO
PAGE 33
FOR
EUTROPHICATION
POTENTIAL AIR
DESCRIPTION

ThyssenKrupp



Note: the information in the charts above is intended for comparison of drive types for elevators with a similar number of stops only. The different numbers of landings, while shown in one figure for convenience, should not be compared because of differences in the underlying assumptions in the LCA model (e.g., a 6-stop elevator is not the same as three 2-stop elevators).

A RUNDOWN ON THE IMPACT OF GOING UP AND DOWN

TURN TO PAGE 33 FOR EUTROPHICATION POTENTIAL WATER DESCRIPTION

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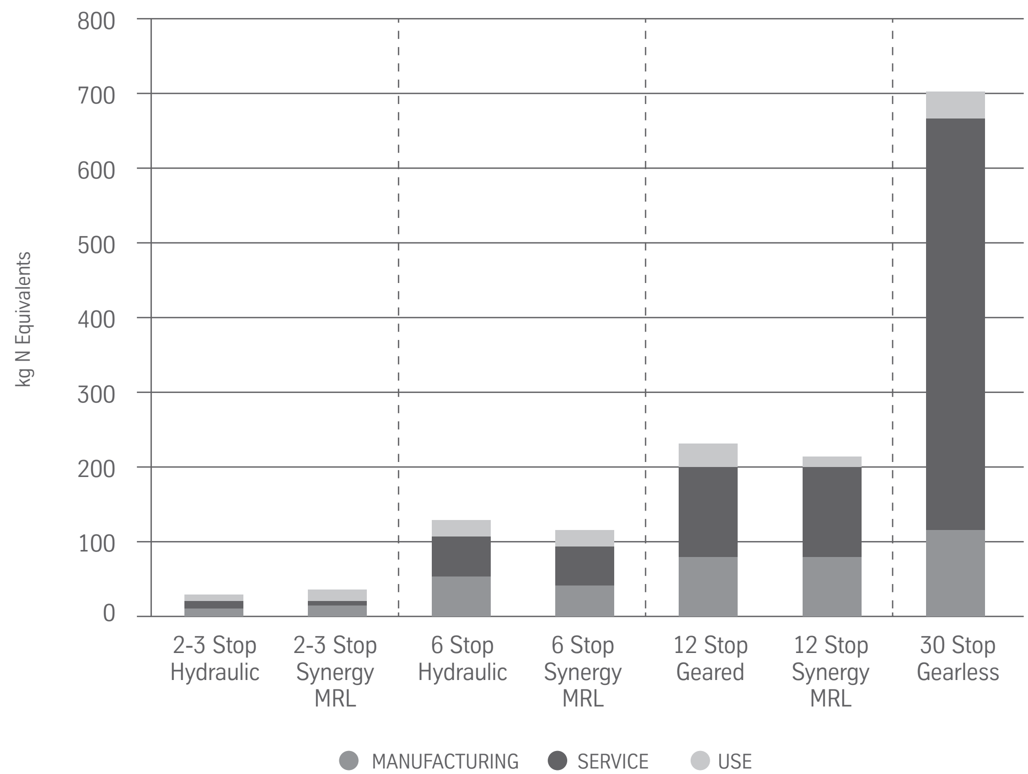
EUTROPHICATION POTENTIAL – WATER

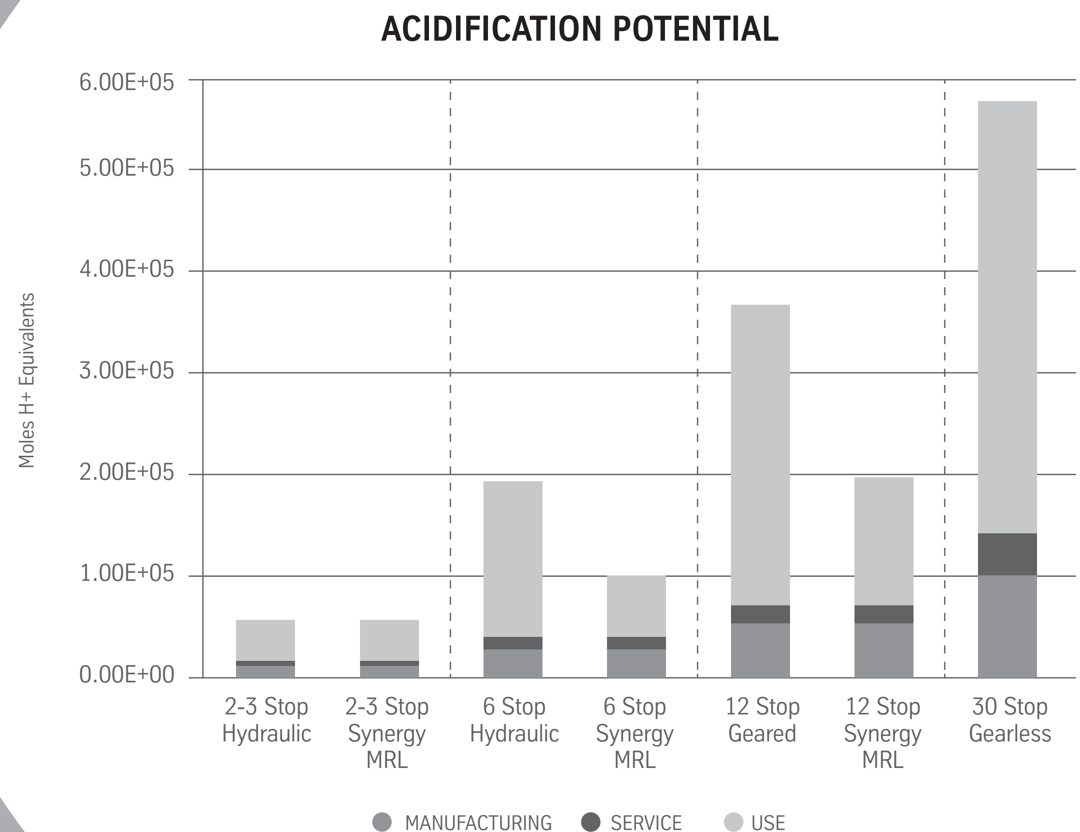


Note: the information in the charts above is intended for comparison of drive types for elevators with a similar number of stops only. The different numbers of landings, while shown in one figure for convenience, should not be compared because of differences in the underlying assumptions in the LCA model (e.g., a 6-stop elevator is not the same as three 2-stop elevators).

A RUNDOWN ON THE IMPACT OF GOING UP AND DOWN

TURN TO PAGE 34 FOR ACIDIFICATION POTENTIAL DESCRIPTION

ThyssenKrupp



Note: the information in the charts above is intended for comparison of drive types for elevators with a similar number of stops only. The different numbers of landings, while shown in one figure for convenience, should not be compared because of differences in the underlying assumptions in the LCA model (e.g., a 6-stop elevator is not the same as three 2-stop elevators).

A RUNDOWN ON THE IMPACT OF GOING UP AND DOWN

TURN TO PAGE 35 FOR SMOG FORMATION POTENTIAL DESCRIPTION

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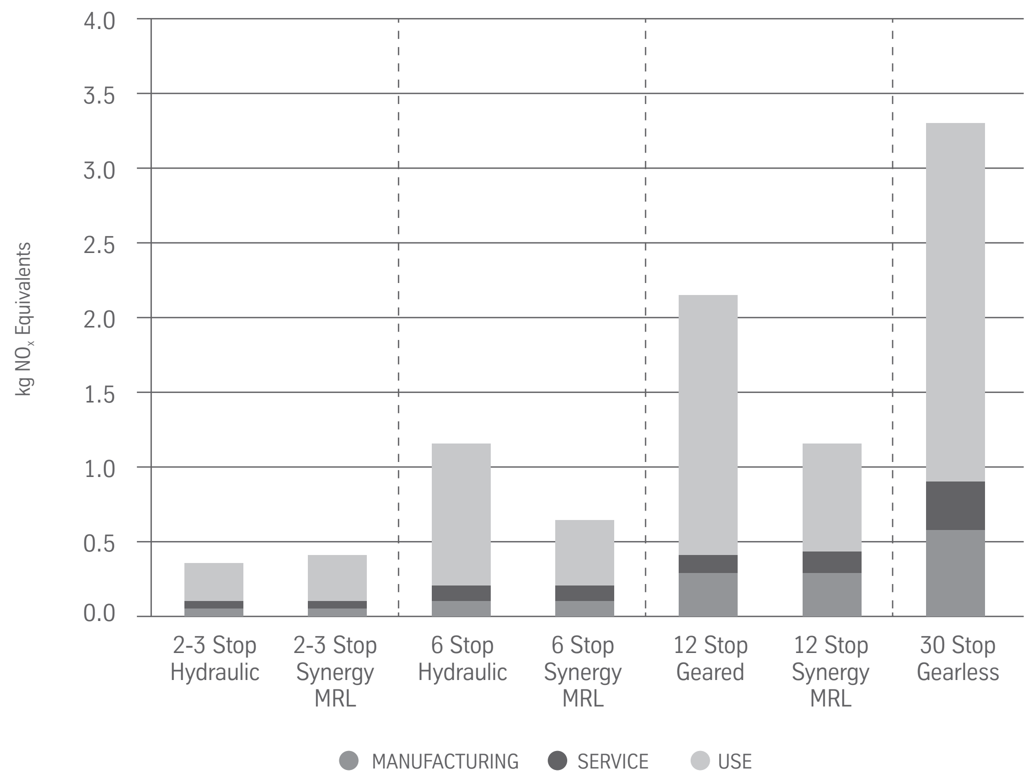
SMOG FORMATION POTENTIAL (POCP)



Note: the information in the charts above is intended for comparison of drive types for elevators with a similar number of stops only. The different numbers of landings, while shown in one figure for convenience, should not be compared because of differences in the underlying assumptions in the LCA model (e.g., a 6-stop elevator is not the same as three 2-stop elevators).

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CONCLUSIONS

The predominant driver of environmental impact in the life cycle of an elevator is energy consumption, primarily during the use phase, followed by the service phase, the manufacturing materials phase and finally the manufacturing energy phase.

The impact categories of primary energy demand, global warming potential, acidification potential and smog potential are also predominant during the use phase, followed by manufacturing. The primary driver of eutrophication, however, is raw material production.

WITH OVER 14,000 EMPLOYEES dedicated to our sustainability mission, we're not just going along for the ride.

ThyssenKrupp Elevator is committed to finding new ways to minimize our impact on the environment by increasing efficiencies, reducing waste and providing greener solutions to our customers.

From this Life Cycle Assessment, it is clear that our environmental responsibility extends beyond the boundaries of manufacturing and distribution to every phase of the product life cycle.

THE RIGHT DIRECTION

Since the impact is greatest after our products are installed and commissioned, that will be our first stop on the journey to sustainability.

As one of the leading elevator companies operating in North America, it is our duty to present the facts, so our customers can make a more informed decision about their vertical space.

At ThyssenKrupp Elevator, our sustainability mission is to provide our customers with the safest, healthiest and most efficient product in the vertical transportation industry.

And by all accounts, we're headed in the right direction.

ThyssenKrupp

CONTACT INFORMATION

For more information about the underlying assumptions and boundary conditions used in this study, please contact Sasha Bailey, LEED AP BD+C. Corporate Sustainability Manager, ThyssenKrupp Elevator, 2600 Network Boulevard, Suite 450, Frisco, TX 75034. Phone: 972.624.7185 sasha.bailey@thyssenkrupp.com

APPENDIX

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Third-Party Reviews

To establish our benchmarks, we enlisted the help of Five Winds International, one of North America's most experienced sustainability consulting firms.

They engaged with PE Americas, using their powerful LCA database software GaBi, to conduct an LCA study of our full product offering and their measurable impact on the environment. This gave us the strongest LCA team available in North America.

After the LCA was completed, we had it peer-reviewed by yet another third-party that included experts in life cycle as well as elevators to ensure the validity of this report.

ELEVATOR SERVICE SCHEDULE ASSUMPTIONS

	Routine Calls	Callbacks	Total Annual Calls	Average Distance
Hydraulic elevator	9 per year	1.5 per year	10.5 per year	10 miles per trip
MRL / Geared / Gearless elevator	9 per year	2.5 per year	11.5 per year	10 miles per trip

Primary Energy Demand

This measures the total amount of fuel extracted from the earth to make electricity. The LCA determined that the Synergy MRL elevator has a 10% higher primary energy demand (PED) at 2-3 stops than the hydraulic elevator.

At 6 stops, this trend reverses and the Synergy MRL generates less PED than the hydraulic elevator.

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Global Warming Potential

Global Warming Potential (GWP) relates to the amount of greenhouse gas emissions generated throughout the elevator's life cycle. The Synergy MRL elevator has 11% higher GWP at 2-3 stops than the hydraulic elevator.

At 6 stops, the converse is true, with the MRL measuring 47% less GWP than the hydraulic elevator. At 12 stops, the MRL has 44% less GWP than the geared traction elevator.

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Global Warming Potential – Manufacturing

Contributions to the global warming potential from manufacturing energy consumption and raw materials increase with the number of landings.

The energy required to manufacture the elevators is clearly a dominant factor over the production of raw materials.

A RUNDOWN ON THE IMPACT OF GOING UP AND DOWN

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Global Warming Potential – Service

Raw materials impacts — cables, machines, interior, modernization, etc. — account for 70% or more of the global warming potential associated with the elevator service phase.

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Eutrophication Potential

This is the process by which a body of water acquires a high concentration of nutrients, especially phosphates and nitrates. Unchecked, eutrophication can deplete the water of available oxygen, causing the death of other organisms, such as fish.

The largest contributor to overall eutrophication is the production of materials used to construct the elevator.

This effect is primarily attributed to water-borne emissions created in the production of cold-rolled steel.

Acidification Potential

Measuring emission levels that produce acidification is important because these effects have a negative impact on water supplies, forests and soil, causing defoliation and weakening of trees.

It can also compromise the soil content and threaten aquatic organisms. The results in this LCA follow the same pattern observed in Primary Energy Demand and Global Warming Potential.

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Smog Formation Potential (Photochemical Oxidant Creation Potential)

Photochemical Oxidant Creation Potential measures emissions of precursors that contribute to low-level smog.

These results also follow the same pattern observed in Primary Energy Demand and Global Warming Potential.