

# THE ROPELESS ELEVATOR SYSTEM

engineering.tomorrow.together.

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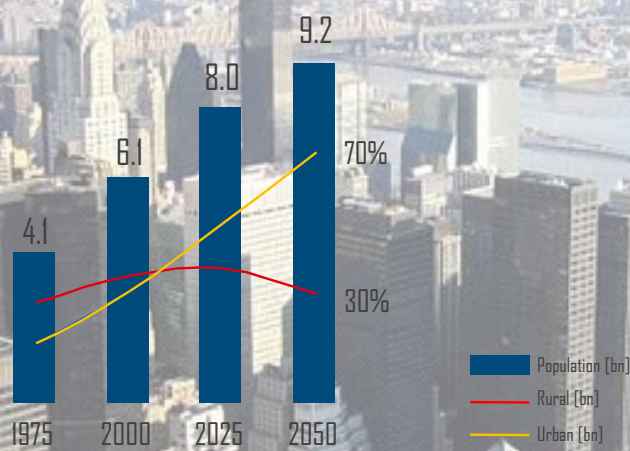


NEXT  
GENERATION  
TECHNOLOGY  
MULTI



# URBANIZATION

## DEVELOPMENT OF URBAN POPULATION

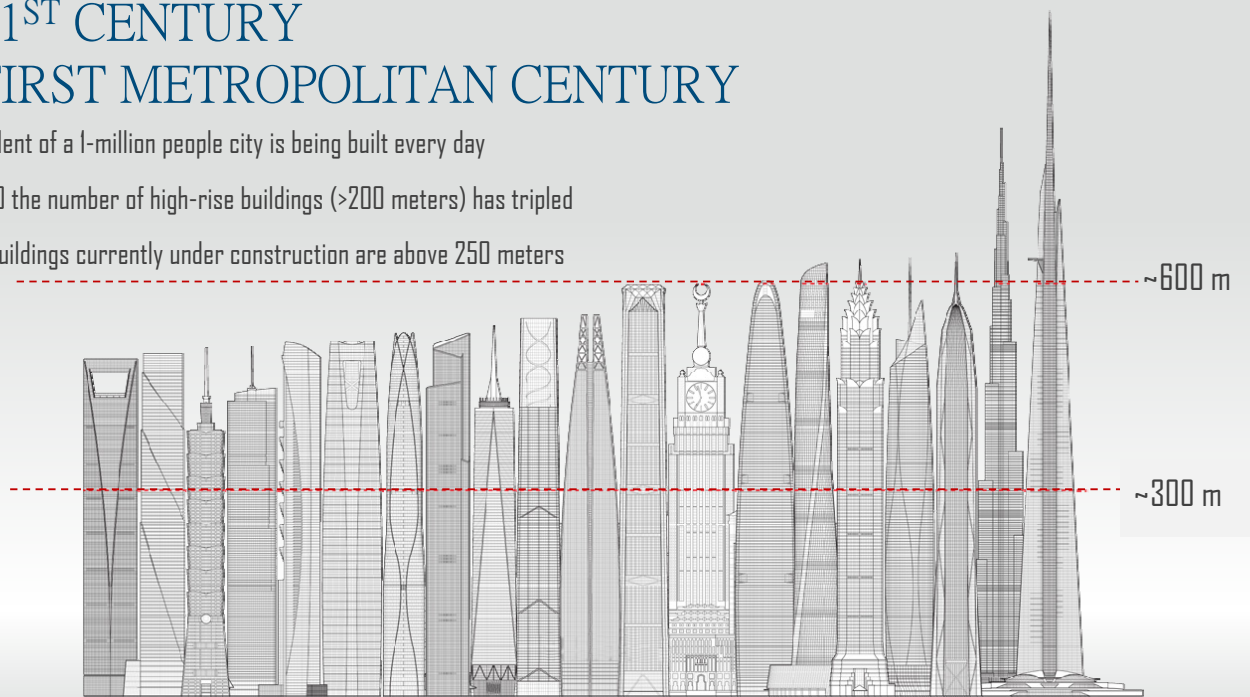


BY 2050 CITIES WILL CONTAIN ALMOST 70%  
OF WORLD' S POPULATION



# THE 21<sup>ST</sup> CENTURY THE FIRST METROPOLITAN CENTURY

- The equivalent of a 1-million people city is being built every day
- Since 2000 the number of high-rise buildings (>200 meters) has tripled
- Over 180 buildings currently under construction are above 250 meters



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## BOTTLENECK ELEVATOR



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ThyssenKrupp Elevator



# TKE PROVIDES AN OPERATING SYSTEM BY MEANS OF ALL...

## LINEAR MOTOR TECHNOLOGY

- Own linear motor technology and competence
- Technology already proven in applications as Maglev Train or ACCEL
- High degree of safety and comfort



## ADVANCED SAFETY FEATURES OF TWIN

- Two cabs independent in one shaft
- Successful use of TWIN concept with independent safety procedure on highest safety level (SIL3)
- Advanced destination dispatch algorithm



## CONTINUOUS PASSENGER TRANSPORTATION

- Former technology in the nineteen fifties
- Various cabs per shaft, moving continuously, enable high transportation capacities
- Based on actual safety standards, the system is not applicable any more since 1974



...ALL PIECES ARE TOGETHER FOR THE NEW PICTURE

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## MULTI – THE NEXT DIMENSION

- A revolutionary idea, but it's not just a new elevator – It's an exciting new “vertical and horizontal transportation system” .
- NO CABLES and no traveling cable required
- Application of totally new technologies, like
  - Linear motor and drive
  - Exchanger, which moves cabin from one shaft to the other
  - New materials (light weight cabin & cabin door)
- It's a shaft-changing cabin system with multiple cabins, running in one shaft – loop. However horizontal links between several loops or to a horizontal track is possible at exchanger levels





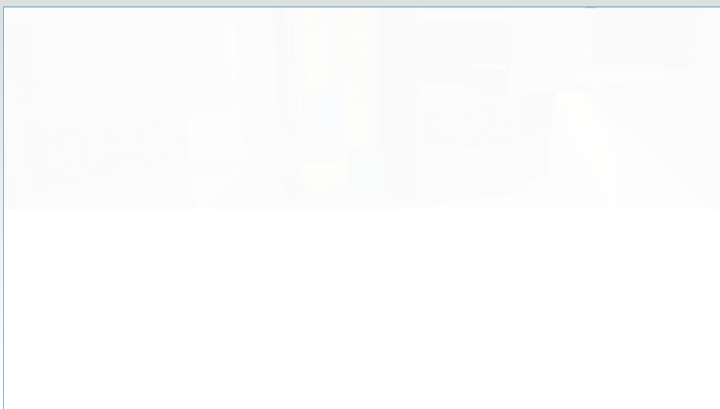
# MULTI – THE NEXT DIMENSION

- The basic approach is a circulating system (paternoster) with an available cabin every 15 - 25s
- The safety concept is based on the TWIN know-how, collision prevention and high level safety features
- Targeted speed: up to 5m/s, extension possible up to 7 m/s
- Ideal with 8 - 10 cabins per side which means 16 - 20 in total in one loop for 600m driveway or 300m height - however not limited



# MULTI – THE NEXT DIMENSION

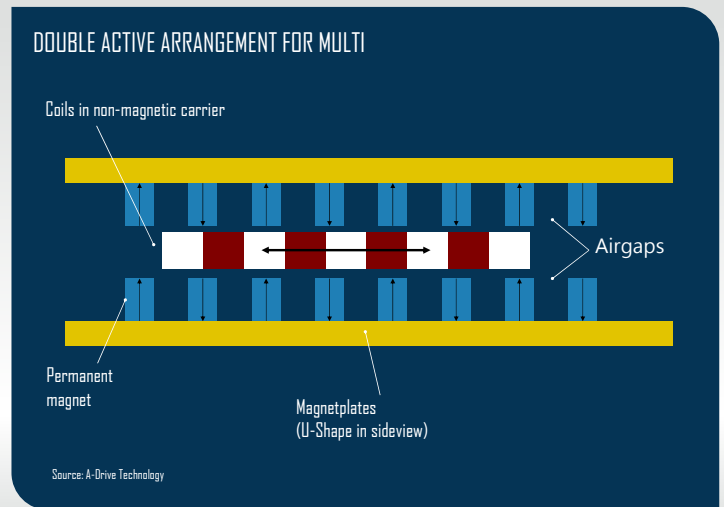
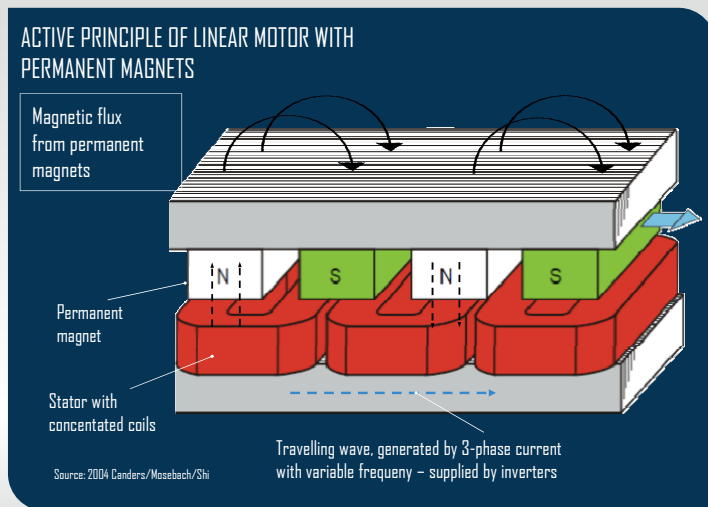
...FROM THE IDEA TO A MODULAR CONCEPT  
VERTICAL MOVEMENT



# MULTI – THE NEXT DIMENSION

## ...VERTICAL MOVEMENT ELIMINATED ROPES

Applying proven technology of Maglev Train to move an elevator vertically and horizontally by means of linear drive

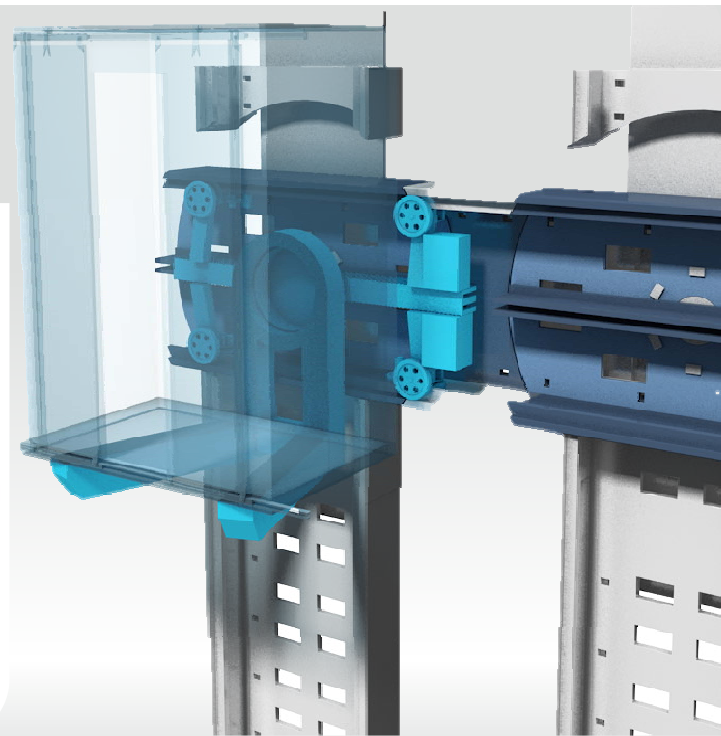
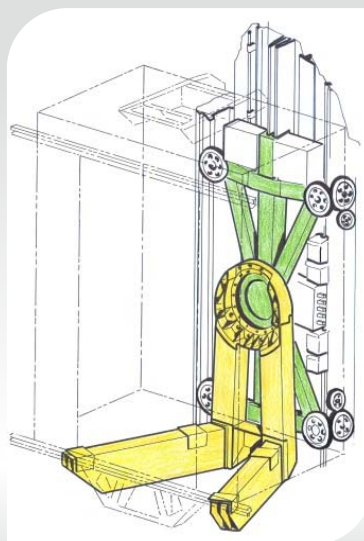


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# MULTI – THE NEXT DIMENSION

## ...WITH HORIZONTAL MOVEMENT

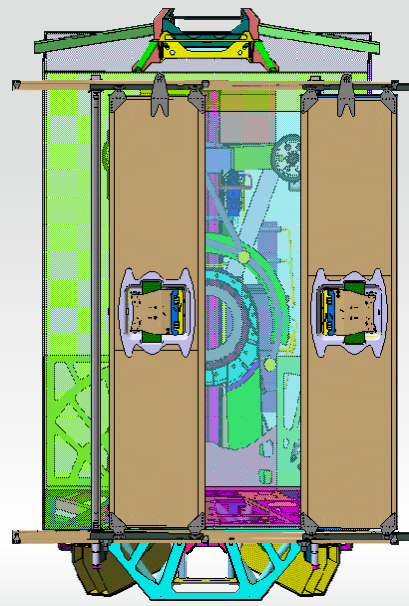
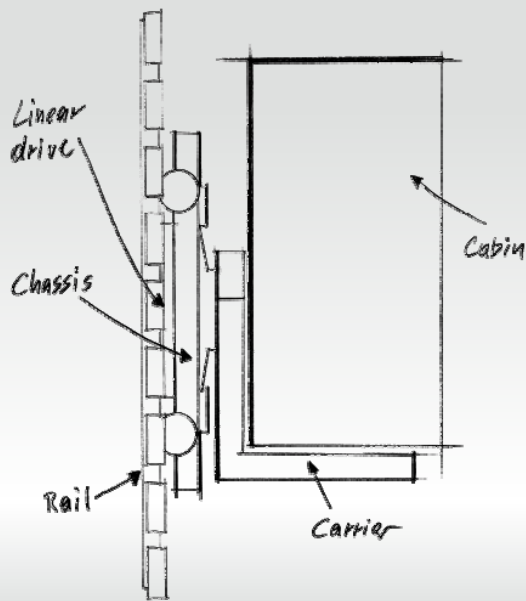
- The miracle of an elevator moving horizontally is the use of linear drive
- Exchanger system which allows a 90° turning of the linear drive and guiding equipment



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# MULTI – THE NEXT DIMENSION

...WITH CANTELEVER CAR DESIGN



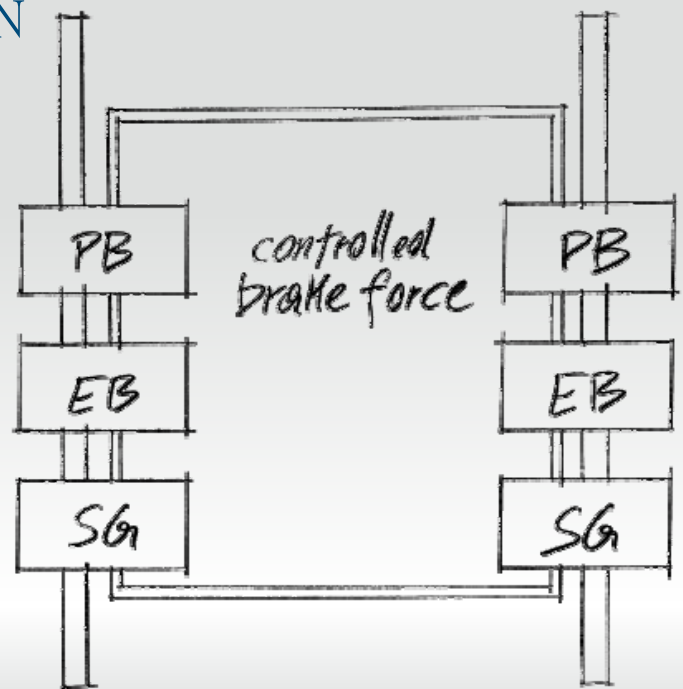
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# MULTI – THE NEXT DIMENSION

...THE BRAKE CONCEPT

Main tasks of Brake system:

- Parking Brake  
→ hold car on position for load and unload of cabin (when propulsion system is deactivated)
- Emergency Brake  
→ decelerate car in case of an emergency stop
- Safety gear  
→ Backup brake, if there is any failure of Parking Brake or Emergency Brake

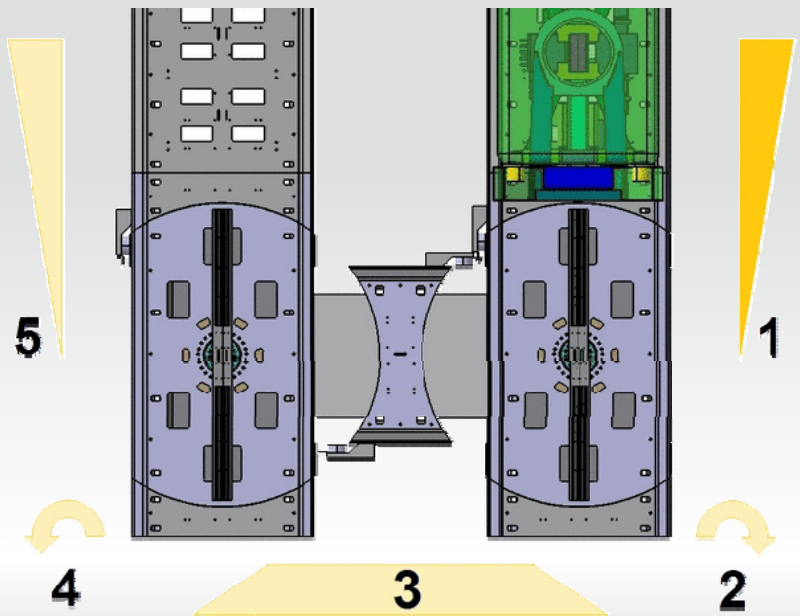


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# MULTI – THE NEXT DIMENSION

...WITH EXCHANGER DEVICE FOR HORIZONTAL MOVEMENT

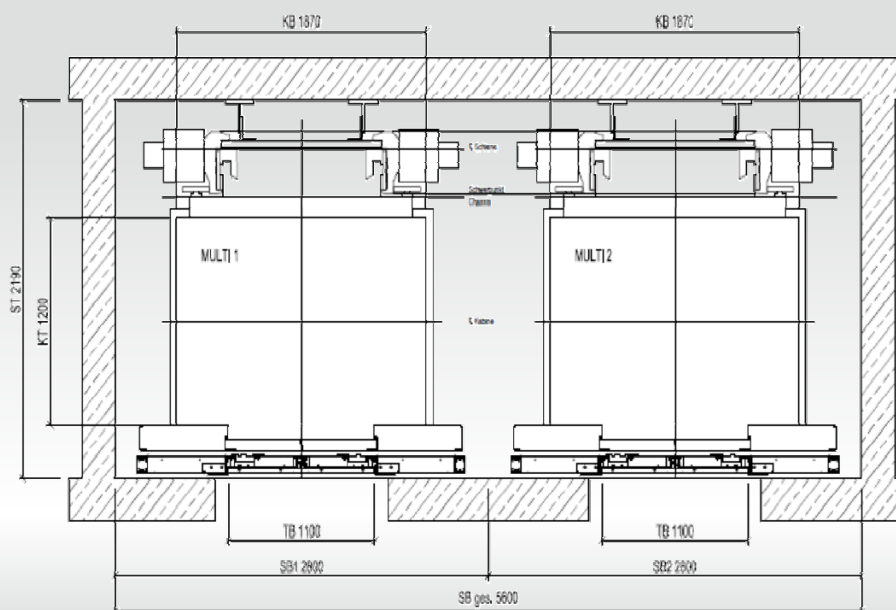
- Vertical movement turns into horizontal movement, using the same linear drive system
- Exchanger module can be placed where needed
- Modular design, with great potential for modular construction
- Horizontal movement provides separate service space



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# MULTI – THE NEXT DIMENSION

TECHNOLOGY FOR NEW VERTICAL TRANSPORTATION CONCEPTS

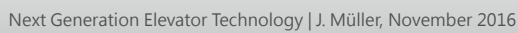


Layout-Example for a double-shaft arrangement

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TECHNOLOGY FOR NEW VERTICAL TRANSPORTATION CONCEPTS – PRELIMINARY SCHEDULE



## 2016: TEST TOWER ROTTWEIL – BUILT FOR MULTI

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