

When the sky's the limit



CBS solutions worldwide

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GRUNDFOS 



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## SETTING OUR SIGHTS SKYWARD

The desire to build high into the sky has been a part of human existence for thousands of years. Just think of the pyramids in Egypt, the Tower of Pisa in Italy, or the Angkor Wat temple in Cambodia. Tall buildings have been used to represent political power and affluence; to honour statesmen or religious icons.

Over the last couple of hundred years, however, a more practical aspect has been built into these high-profile projects. Tall buildings reflected the need to make the best possible usage of a relatively small area of land. The skyscraper was born. Workers, equipment, and information could now be gathered, streamlining processes and increasing effectiveness.

At Grundfos, our approach to working with pumps for commercial building services has similar characteristics: we are driven to provide the best possible results with the utmost in efficiency. Our pump experts engage themselves in creating solutions that stand tall in a bustling metropolis of tenders, contracts, and day-to-day operational issues.

The builders of impressive skyscrapers obviously believe in this method, too. Grundfos is proud to be a major supplier to the consulting engineers, contractors, building owners, and users involved with tall buildings all over the globe. Impressive amounts of pumping solutions in these constructions employ Grundfos pumps and control equipment.

You'll find our solutions in water supply, heating, air conditioning, pressure boosting, fire fighting, and wastewater applications. They are all created with a special focus on sustainability, where we strive to minimise their environmental impact as much as possible.

As we set our sights skyward once again, this brochure presents selected Grundfos solutions that have been created in a mixture of tall buildings. The numerous solutions within are a testament to Grundfos' wide range, and a tribute to the dedication of the skilled individuals who made the buildings possible.



## DARING TO OVERCOME GRAVITY

For the layman, standing at the base of a tall building often involves a combination of awe, admiration, and intrigue. He or she eyes the building most times just as it was intended: as a single, comprehensive element, daring gravity to keep it from reaching the clouds.

For the professional, however the story can sometimes be a bit different. Sure, we all marvel at unique designs, but we hunger to see what is behind the curtain of steel and glass. We know how challenging it is to create, operate, and maintain a skyscraper; things the man in the street doesn't pay a second thought.

Grundfos' expertise within pumps for commercial building services is built on years of know-how and intensive product development. We're dedicated to providing a customer focus, system knowledge, comfort in use, and commitment to the entire building's life cycle that is unparalleled in the industry. In short, we help create the most valuable floor space possible.

Inside this brochure, we'll take you to different skyscrapers around the world, each with its own unique Grundfos solutions. You get to see some buildings you may already know, and discover new ones as well. So step back, look up, and see how others have headed into the heavens.

## SELECTED VENUES

Grundfos pumps and pump systems are present in numerous tall buildings around the world. We have selected the six listed below to give you a glimpse into their world as well as ours. Presentations of these various installations are found in the pages of this publication.

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- 2 ISBANK – ISTANBUL, TURKEY**  
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- 3 MOSCOW CITY NORTHERN TOWER – MOSCOW, RUSSIA**  
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- 4 THE FIGUEROA AT WILSHIRE – LOS ANGELES, CALIFORNIA, USA**  
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# LONG-TERM SAVINGS



Water supply  
6 Grundfos Hydro 2000 MF pressure boosting systems  
featuring CR32 and CR8 in-line pumps  
2 CR multistage in-line pumps

GRUNDFOS SUPPLIED



# SEOUL



*“Grundfos pumps have performed exactly as I need them to: perfect every single day. In fact, they run so well that I did not have a single downtime issue for over seven years”.*

Sang Hyun Lee, Managing Director, I service

The financial district of any city is arguably one of the most vibrant. Bustling with traders and bankers, Seoul’s Gangnam financial district is no different. It draws on the energy provided by the ten million people living in this metropolis.

### LARGEST OFFICE BUILDING IN KOREA

Climbing to over 200m, the 45-floor Gangnam Finance Center is an eye-catching part of the financial district. It is the largest office building in Korea, with floor space on each story running up to 242,000 m<sup>2</sup>. Economically-sensible office layouts abound, thanks to the pillar-less design and a lofty ceiling height of 2.7m.

It is known across the land for its outstanding architecture, where the entire architectural design concept of the building is focused on a complete harmony between its environment, humans, and technology. Opened in 2001, it features a host of tenants, as well as an exciting shopping mall inside its premises.

During construction, builders of the Gangnam Finance Center placed high demands on reliability and user friendliness with regards to all the pumps that were to be installed. Their previous experiences with Grundfos assured them that all requirements would be met.

### HIGH EFFICIENCY

Grundfos emphasised its energy efficiency in terms of Life Cycle Cost (LCC). This entails looking at the cost of a pump system over its entire lifetime. Initial purchase price makes up approximately 5%. Installation and maintenance make up approximately 10%, whereas energy consumption makes up approximately 85%! The high operational efficiency of the Grundfos Hydro 2000 MF system allowed the Gangnam Finance Center decision-makers to see how much this low energy consumption could mean over the lifetime of the entire solution.

Inside, the specially-designed water supply system delivers a constant water pressure for all users of the Gangnam Finance Center at all times. A total of six Grundfos Hydro 2000 MF pressure boosting systems are hard at work every day.

### DESIGNED TO LAST

All Grundfos Hydro 2000 MF booster systems are designed to last: sturdy, compact units with easy access to all service parts. They can be used wherever additional pressure is needed. Each booster model has been designed to meet specific demands for capacity and control that a customer faces.



# ISTANBUL

# STATE-OF-THE-ART SOLUTIONS

*“Our Grundfos solution is even better than what we expected. The entire system performs as promised, and apart from the regular service checks, the pumps are virtually maintenance-free.”*

Dincer Duduoglu, Technical Manager, Isbank

Established in 1924 just after the Republic of Turkey was formed, Isbank holds the honour of being the country’s first truly national bank. Today, Isbank tops the list of Turkey’s most respected enterprises, and is included among the world’s largest corporations.

In 2000, the bank opened its new headquarters in Istanbul. The complex consists of three towers: the highest is 53 stories high and the two smaller towers are 34 stories high. It contains the bank’s main branch office, an 800-seat auditorium, and a shopping centre. The remaining space of the 224,000 m<sup>3</sup> complex serves as headquarters for Isbank and its holding companies.

### PRESSURE BOOSTING

Lifting water 180m straight up from the basement to the 52nd floor was not an option, due to the extreme load that the system would be subjected to. Grundfos pressure boosting systems are placed in the basement, on the 5th floor, on the 23rd floor, and on the 39th floor. Doing so reduced the static pressure on the pumps considerably. Smaller and much more energy efficient pumps could be installed, which would reduce energy and maintenance costs significantly.

### AIR-CONDITIONING

With the chiller in the basement and the cooling tower on the top of the building, the air conditioning pumps would also suffer under an extremely high static pressure. Consequently, cooling tower pumps were also installed halfway up the tower, on the 23rd floor. As a result, the Grundfos solution guaranteed the right inlet pressure and lower initial costs during the creation of the building.

Although the Grundfos solution was somewhat unorthodox, the placing of powerful pumps right between office floors was also rather ingenious. To prevent vibration and noise nuisances, Grundfos custom-built vibration dampers, consisting of a concrete base with built-in springs/shock absorbers, on all floors. As a result, noise and vibration were virtually eliminated.



GRUNDFOS SUPPLIED

**Heating/ventilation/air conditioning**  
111 LM/LME/LP/LPE in-line zone pumps  
53 LMB In-line circulation pumps  
44 NK end-suction pumps  
18 CLM In-line pumps

**Pressure boosting**  
23 Hydro 1000 pressure boosting solutions featuring CR in-line pumps

# HIGH AMBITIONS

# MOSCOW



*“Working with Grundfos pumps offers us a number of advantages compared to other pumps such as reliability and user-friendliness. We also greatly enjoy that all required spare parts and accessories are always available.”*

Sergey B. Burmakins, Engineer, Northern Tower services

The prestigious Moscow International Business Center project covers one square kilometre in Moscow’s central business district, and is due to be completed in 2010. Fifteen skyscrapers climb skyward, requiring you to stretch your neck in wonder at them all. The project has been touted as a Russian counterpart to Manhattan.

Among this fascinating complex is the Northern Tower. This 108m high, 135,000 m<sup>2</sup> tower contains office suites, a concert hall, fitness-centre, restaurants, cafe, and even a medical establishment. Outward-facing offices enjoy spectacular views of Moscow and its surroundings.

The tower features the latest technologies, and Grundfos-based water supply, heating, air conditioning, fire fighting, and wastewater systems.

All Grundfos heating pumps provide a high degree of comfort for the users of the Northern Tower, including a lack of noise in the systems, peace-of-mind thanks to stable operation, and a satisfaction with their dedication to sustainability.

## HEATING

113 Grundfos ALPHA and UPS circulator pumps are in use in the Tower, along with 51 Grundfos TPE pumps which provide the main circulation power and hot water supply for consumption. Additional CR in-line pumps serve as heating system feed pumps.

## PRESSURE BOOSTING

Two Grundfos Hydro 2000 ME pressure boosting systems with CR in-line pumps ensure that all sections of the tower never suffer from a lack of water pressure.

## COOLING AND AIR CONDITIONING

The massive central air conditioning system relies on 26 Grundfos TPD pumps of various sizes, along with Grundfos CR and NB pumps.

## FIRE PROTECTION

Limiting the effects of a fire was naturally important for the people behind the Northern Tower. Therefore, a number of complete Grundfos fire fighting systems were installed. They stand by, ready if the call for pumping comes in. In total, 14 Grundfos NK end-suction pumps and 22 CR multistage in-line pumps are dispersed throughout the building.

## WASTEWATER

Wastewater removal is carried out by several Grundfos Multilift-MD and Sololift+ WC-1 lifting systems installed in lower levels of the Northern Tower.



**Heating/ventilation/air conditioning**  
113 ALPHA/UPS circulators  
51 TP/TPE in-line pumps  
10 NB end-suction pumps  
3 CR in-line pumps

**Wastewater**  
10 AP wastewater pumps  
6 Sololift+/Multilift lifting stations  
6 DW drainage pumps

**Fire fighting**  
22 CR in-line pumps  
14 NK end-suction pumps

**Pressure boosting**  
2 Hydro 2000 ME pressure boosting solutions featuring CR in-line pumps

GRUNDFOS SUPPLIED

MOSCOW CITY NORTHERN TOWER  
MOSCOW, RUSSIA

## LOS ANGELES

## REPLACEMENT SAVES MONEY

THE FIGUEROA AT WILSHIRE  
LOS ANGELES, CALIFORNIA, USA

*“Our customer at The Figueroa is elated by their Grundfos pressure boosting system. They often bring other building engineers to tour the booster pump mechanical room, as they are so proud to be going green, saving energy and maintenance costs at the same time. Grundfos is our first choice!”*

Eric Skjarstad, President/CEO, PumpMan Inc.

Rising dramatically in the heart of Los Angeles' financial district, the attractive Figueroa at Wilshire is a true pleasure on the eyes. It's 52-storeys feature a polished Brazilian rose granite exterior, a pair of 23-metre high atria lobbies, stunning granite floors, and an alluring open-air plaza. Measuring in at 218.5m, it's height makes it the 5th tallest building in the City of Angels.

Built in 1990, the 130,000 m<sup>2</sup> building has enjoyed great success as the home of banks, legal offices, investment councillors, and many more over the years. It has also been home to pumps and pump systems that were adequate when installed, but which could stand to be replaced nowadays.

The water supply and pressure boosting systems found within featured a twin zone, constant-speed pump construction. Each zone was covered by three pumps, all of which had only two operational settings: Either On or Off. Floors 1-25 were covered by the low zone system; floors 26-52 were naturally covered by the high zone system.

### REPLACEMENT THE ANSWER

An energy audit done by the property owners in 2005 identified these pumps as a good place for energy savings. Replacing them was seen as a major operation, and the building owners expressed a strong desire to install the new pump system without disrupting service to the Figueroa's tenants. A two-stage replacement process was put into works, ensuring proper operation during the job.

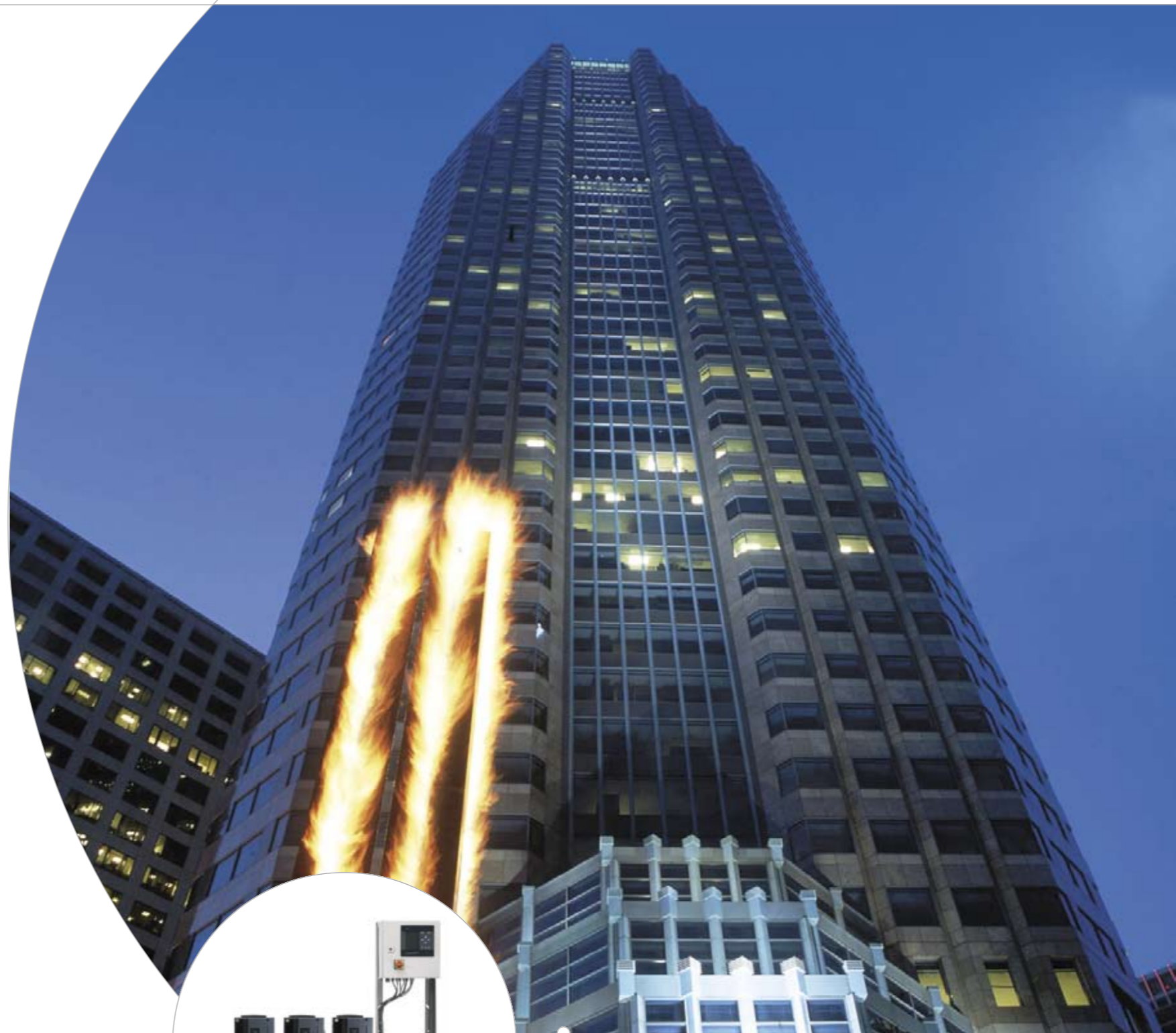
### NEW HIGH-ZONE SYSTEM

The original high-zone system featured two triplex constant speed booster pump systems. These six pumps were replaced by a single Quadroplex Grundfos BoosterpaQ pressure boosting solution. Consisting of four Grundfos CRE multistage in-line pumps, a Grundfos Control 2000 cabinet and all necessary fittings, the solution is mounted on a common base frame.

The variable speed CRE pumps offer extremely quiet, low vibration operation, along with operating efficiencies up to 80%. Prior to delivery at the Figueroa, this Grundfos BoosterpaQ was factory tested and programmed according to the building's unique specifications. This customisation and service is standard procedure for all Grundfos BoosterpaQ systems.

### SAVINGS ALL THE WAY ROUND

The Grundfos BoosterpaQ pressure boosting solution, the building management team at the Figueroa at Wilshire have achieved savings of over USD 40,000 a year. Total equipment operating hours dropped from an average of 184 hours per week for the six-pump system to 60 hours per week for only four pumps.



GRUNDFOS SUPPLIED

1 Quadroplex Grundfos BoosterpaQ pressure boosting solution featuring 4 CR multistage in-line pumps

# ABOVE THE ENTIRE WORLD

# DUBAI



THE BURJ DUBAI  
DUBAI, UNITED ARAB EMIRATES

*“We chose Grundfos due to the superior flexibility they offer. I have personally been working with Grundfos products for 25 years and I know the reliability that stands behind the Grundfos name.”*

George Joseph, General Manager – Projects, Emirates Trading Agency

Can you imagine a single, self-supporting building climbing several hundred metres into the heavens? A building filled with residences, offices, luxurious clubs, a hotel, and even more? Dream no more, for the Burj Dubai has all this, and is still growing.

Even before it has completed, the Burj Dubai has become the tallest man-made structure in the world. The official height has not even been released, and remains secret. The communicated total height of 808m – 300m higher than its nearest competing skyscraper – is subject to change.

This one-of-a-kind project relies heavily on Grundfos pump solutions in a number of applications. Interestingly, everyone working on the project thought that the big challenge would be to pump the water to such great heights. They soon found out that an even bigger challenge was to systematically and efficiently manage the wastewater from a tower of this stature.

## WASTEWATER

Wastewater removal from the thousands of daily user, of the landmark is carried out by over 100 Grundfos SENV submersible wastewater pumps with vortex impellers. These powerful wastewater pumps feature the ability to handle solids up to 100mm in diameter, reducing the risk of clogging. Strategically placed, these pumps are trustworthy partners for Dubai’s magnificent centrepiece.

21 Grundfos AP drainage pumps are furthermore on hand, removing excess water safely, efficiently, and effectively.

## HOT WATER CIRCULATION

80 Grundfos CRN in-line pumps are distributed on several of the 160+ floors of the Burj Dubai. Pump size and placement has been determined in close cooperation with the customer, and adapted to the size of the area they will serve. Common for all of them is their construction in high-grade AISI 316 stainless steel, which offers exceptional corrosion resistance.

After all, a hot shower following a day in the Arabian desert wouldn’t be very satisfying at 600 or 700m up without any hot water, now would it? Thanks to Grundfos, Burj Dubai residents won’t have to worry about this.



**Wastewater**  
108 SENV submersible wastewater pumps  
21 AP drainage pumps

**Hot water circulation**  
80 CRN in-line pumps

GRUNDFOS SUPPLIED





## SEOUL

## EFFICIENCY INCREASED AT ICON

63 BUILDING  
SEOUL, KOREA

*“The customer was very satisfied with the quality and reliability of our Grundfos pumps. All systems fulfilled their requirements, which we believe will help us secure similar remodelling jobs in the future.”*

Hyun Wook Shin, Sales Manager, Grundfos Korea

Tapering gently from its base, the 63 Building in Seoul slopes skyward to 249m above the ground. Built in 1986, this Korean icon amongst skyscrapers held the title of tallest building in Asia upon completion. With its attractive golden exterior, it is a landmark in the capital city.

The many facilities in the tower include a two-floor aquarium, an immense IMAX theatre, and an observatory on the top floor. Getting there is though half the fun. Innovative elevators with large windows offer visitors thrilling views of Seoul along the way.

The 63 building was indeed top-of-the-line when it was built. As time has passed and technologies have improved, however, the pump systems installed in the 1980's became outdated. Electrical consumption had reached 3,700,000 kW per month, and the HVAC system featured a low degree of efficiency when compared to today's offerings. The management decided to spend their money more wisely by replacing the existing installations and raise the overall efficiency.

### AIR-CONDITIONING

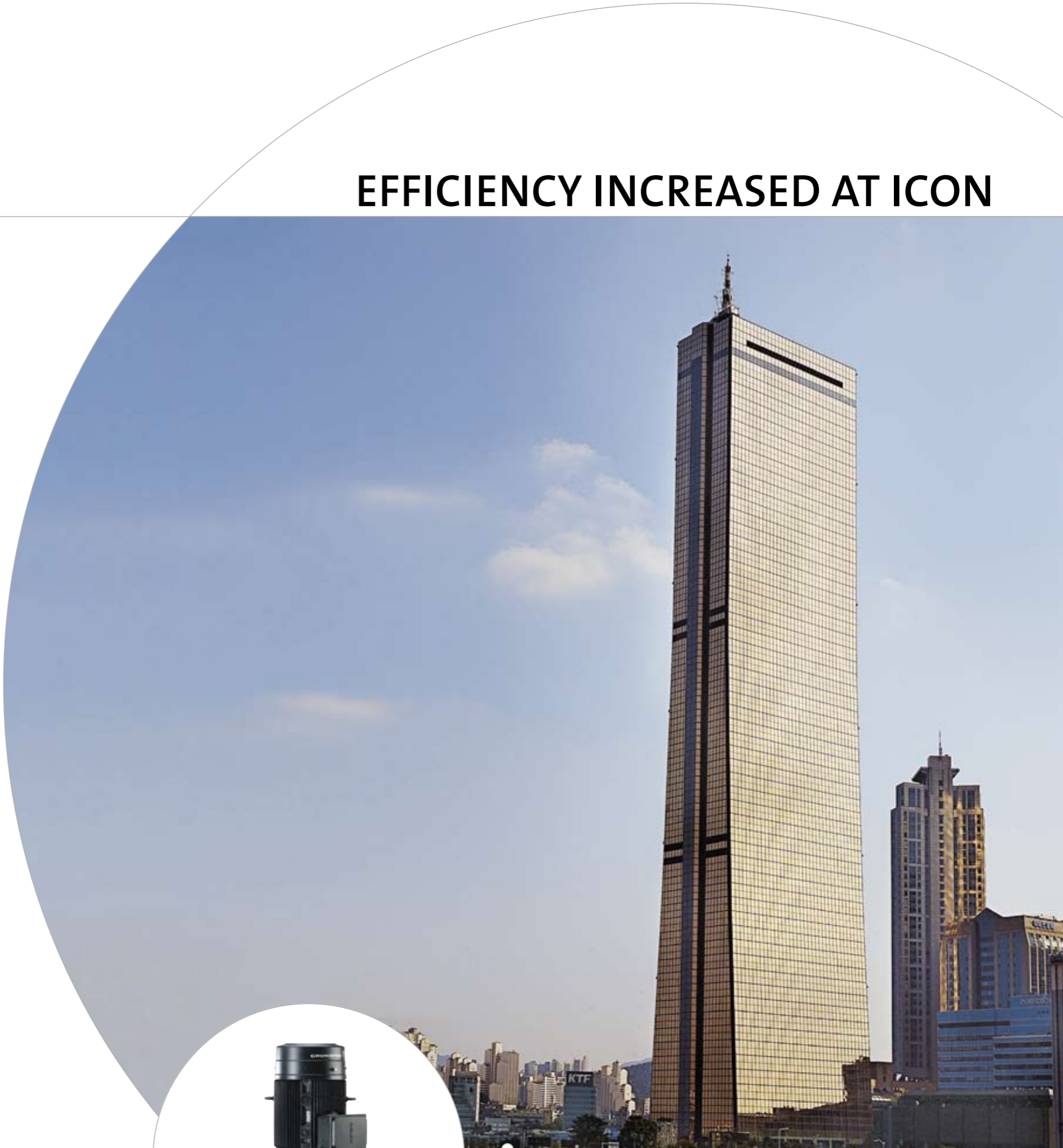
Over 50 Grundfos pumps now compose the heart of the circulation system for hot and cold water in the 63 Building's cooling and air-conditioning systems. 39 TP in-line pumps and 12 CRE electronically speed-controlled multistage in-line pumps ensure comfortable conditions for the users of the building. The previous system has been replaced completely.

When searching for the proper pump supplier, Korea Life Insurance Co., Ltd found three major reasons as to why Grundfos was the best possible solution:

First, Grundfos was able to provide the highest energy efficiency among available pumps for their system. Compared to the other brands, Grundfos provided an efficiency within vertical multi-stage pumps that was up to 15% greater, and an efficiency up to 10% higher within in-line pumps.

Secondly, Grundfos had the trustworthy quality the customer required, especially within the delivery of adequate system pressure.

Finally, the prompt and quick response from Grundfos service personnel, regardless of the subject or time of day, was of great importance to the customer.



GRUNDFOS SUPPLIED

Heating/ventilation/air conditioning  
39 TP in-line pumps  
12 CRE multistage in-line pumps



## GRUNDFOS AROUND THE WORLD

A tall building represents a true melting pot of activities, where diverse elements mesh into a single, unified expression of excellence. Likewise, a partnership with Grundfos combines components that extend beyond sale and delivery: we follow through in all aspects of the agreement.

As a full-line pump supplier, Grundfos is your guarantee for reliable and cost-effective solutions. In close cooperation with you, we can design state-of-the-art pump solutions that match and exceed your expectations.

### GLOBAL SERVICE NETWORK

Our highly efficient worldwide organisation of sales, support and service professionals spans 46 countries in close cooperation with more than 530 service partners. Grundfos service is never far away, no matter where on the globe you are based.

### EXPERTS IN PUMP TECHNOLOGY

Grundfos can assist you through every stage of your building's life cycle: from initial sizing, through installation and commissioning, to energy consumption auditing, and even pump replacement. We are specialists: it is our business to know all there is to know about pumping.

### DEDICATION TO QUALITY

Precisely when you want us to enter the picture, is really up to you. However, you can always be certain of one thing: dedication to quality. To learn more about how Grundfos and your team can unite, please contact your local Grundfos company.

[www.grundfos.com](http://www.grundfos.com)

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BE > THINK > INNOVATE >

Being responsible is our foundation  
Thinking ahead makes it possible  
Innovation is the essence

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