

Hotel Information Display, Air Conditioning & Hot Water Solutions *Energy Saving Case Studies from local market*

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LG Corporation

Holding Structure

Companies **63**

Revenue USD **142.7** Billion (2016)

17 ELECTRONICS



- LG Electronics
- LG Display



16 CHEMICALS

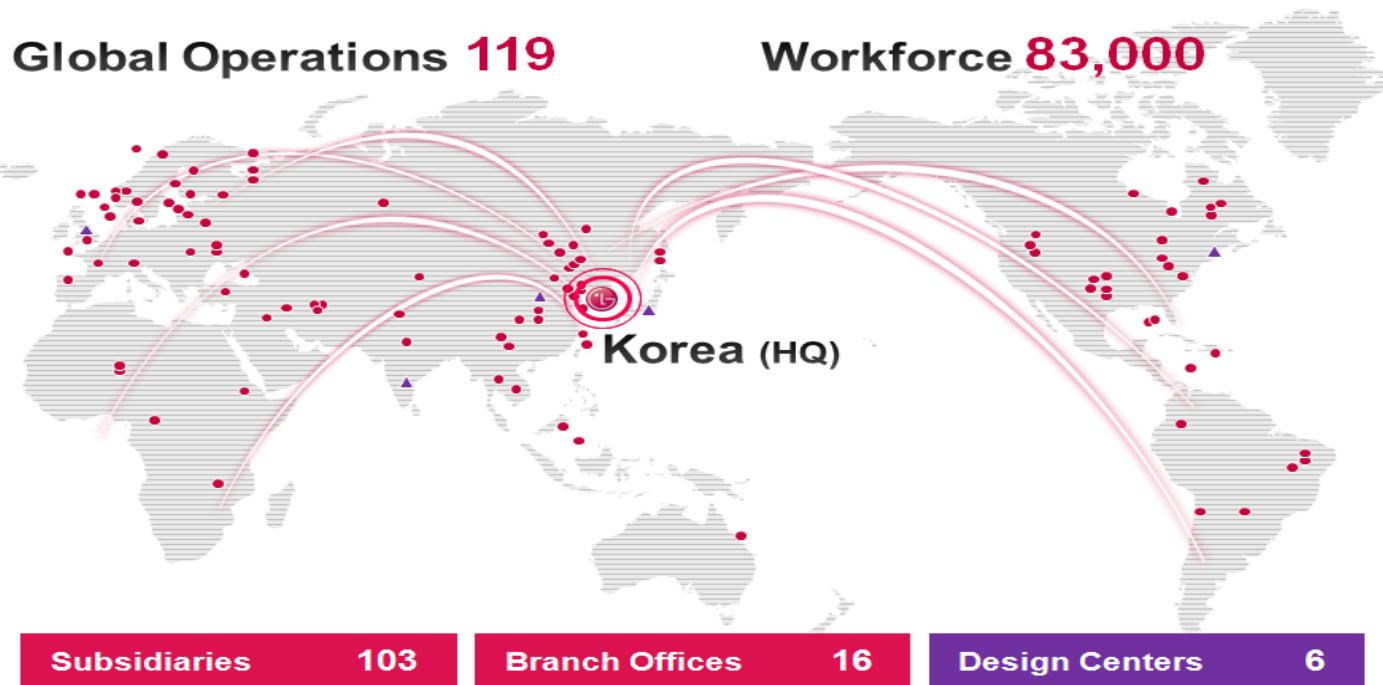
- LG Chem
- LG Household & Health Care



30 TELECOM & SERVICES

- LG U+
- LG CNS





LG Global production infrastructure

Global Production Site Plants Certified by

- ISO 9001 (Quality management)
- ISO 14001 (Environmental Management System)
- OHSAS 18001 (Occupational Health & Safety management system)



Do you know about LG?



Embodying elegant and **stylish designs** across the products, with **superior technologies, environmentally friendly** and incomparable **serviceability**

Market Leadership

- Global presence and referrals in **Hospitality Market**
- Premium Brand for Guests

Product Leadership

- - Vertically integrated R&D for **Hotel products**
- Innovative and integrated Technology
- Reliable Solution / Energy efficient

Strategic Partnership

- Top **Hotel** partners
- Consultative Offering
- Global Network and Service
- Operational excellency

Hotel Business needs to optimize...

- ✓ **Budget** : Total Cost Ownership, Maximized space efficiency
- ✓ **Operating costs** : Efficient resource allocation
 - **Initial Purchasing costs vs. Operational costs**
- ✓ **Tailored Service for Customer experience**: Satisfaction & Retention
- ✓ **Eco friendly and Innovative Brand Image**: Reputation & referral

Hotel Solution should...

- ✓ **Enhance hotel premium image & operational excellency**
- ✓ **Meet challenges and required trends with proven solutions**

LG's Hotel Business and Solution...

What we offer : Value Proposition & Benefit



Devices for LG Hotel Smart Solutions

Multimedia & Entertainment

UHD, OLED, Curved TV, Hotel TV
Sound Bar/Plate
STB
Mobile



Smart IT

Signage
Security
Monitor
Projector



Smart Energy

HVAC
Lighting
Solar



What we offer : Value Proposition & Benefit



LG Hotel Smart Solutions

1. Infotainment Solutions
3. AirConditioning Energy Saving Solutions



Infotainment Solutions : Service Scene

5 Fitness Center



- Cyber Fitness
- Enjoyable Content

4 Hallway



- Way Finding
- Property Information

3 Meeting Room



- Conference/ Meeting
- Collaboration

2 Reception

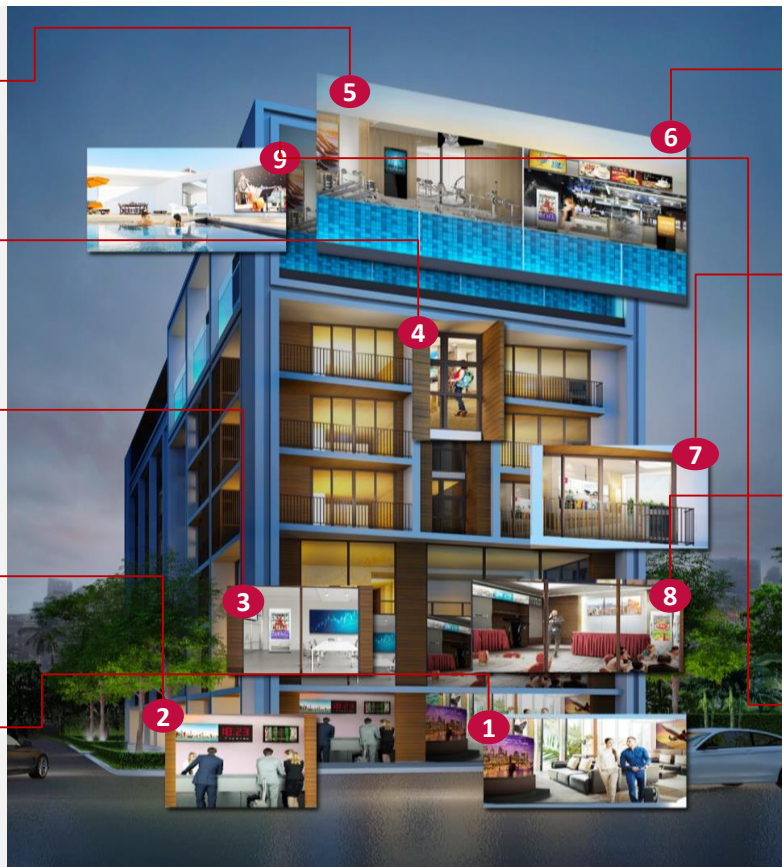


- Welcome Message
- Property Information

1 Lobby Hall



- First Impression
- Enjoyable & Informative Content Service



6 Restaurant / Bar



- Advertisement
- Promotion Information

7 Hotel Room



- Residence
- Rich Content
- Convenient User Experience

8 Conference Center / Event



- Event Information
- Special Effect

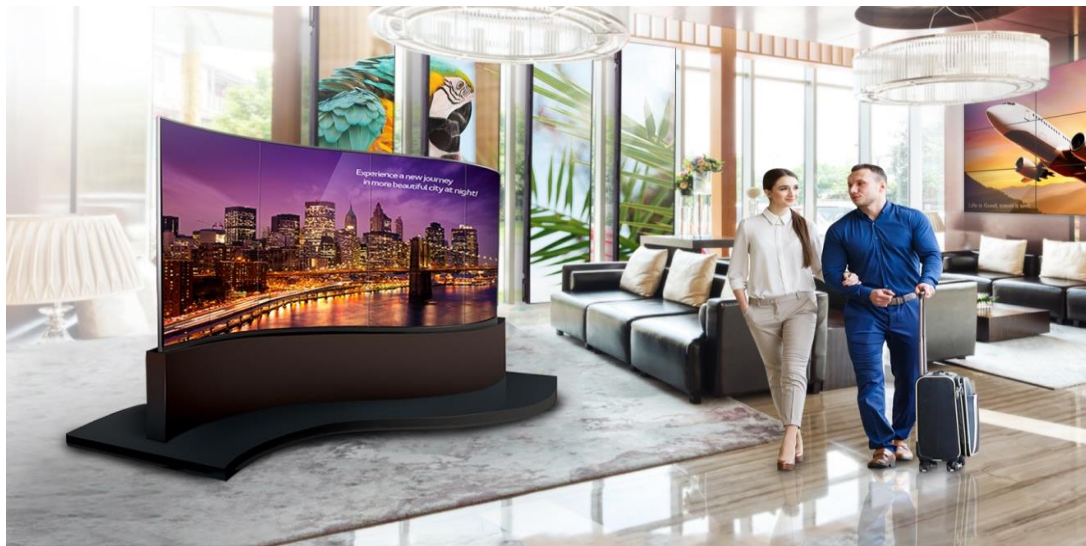
9 Outdoor Swimming Pool



- Outdoor Environment
- Enjoyable & Informative Content Service

1. Service Scene – Lobby Hall

- Provide memorable first impression with unique digital sculpture.



Products & Solutions



Video Wall:
55VH7B /
VM5B
49VH7C /
VM5C



Dual-view Curved OLED:
55VH7B / VM5B
49VH7C / VM5C



Ultra Stretch:
86" BH5C / BH7C / 88"
BH7D



SuperSign:
content management

Space characteristics

- First impression of the hotel
- Need to Create luxury/smart image with visual, informative, and convenience features
- Need to be able to update contents real-time in accordance with changing information such as weather and local news

LG's Solution

- Improved liveliness of the space with video wall and advertisement, video clips, and promotional contents
- Efficient utilization of the space with dual-view OLED signage
- Creation of unique digital sculpture with Ultra Stretch Displays
- Easy, real-time content management with SuperSign Solution

2. Service Scene – Reception

- Improve communication and information sharing at the reception with Smart signage solution.



Products & Solutions



Standard Signage



Ultra Stretch:
86" BH5C /
BH7C / 88" BH7D



SuperSign:
content management

Space characteristics

- Place where the hotel guests are being helped in person for Check-in, Check-out, and Concierge Service
- Need to provide quick service and various information
- May cause inconvenience or complaint when the queue time gets long

LG's Solution

- Ultra Stretch Displays:
 - Provide various information (world time, currency, hotel service, etc.) and images/videos concurrently on one screen
- Standard Signage:
 - Provide useful information such as room service and promotional messages
 - displaying various contents with PBP/PIP function
 - interactive service with Touch Signage

3. Service Scene – Meeting Room

- Provide pleasant and smart work space for business travelers and guests.



Products & Solutions



Video Wall:
55VH7B /
VM5B
49VH7C /
VM5C



Ultra HD TV



**Transparent
Cooler**
49WEC



SUPER SIGN SuperSign:
webOS content
management

Space characteristics

- Need to provide nice service and facility for business travelers and guests who have expectations for the money they paid
- Place where powerpoint/video presentations and discussions take place
- Various service request (F&B, Concierge, etc.)

LG's Solution

- Delivery of presentation/meeting materials with superior image quality, made possible by Ultra HD Display
- Delivery of visual information via Video Wall
- Able to request for service with simple touch via Touch Screen Kiosk
- Easy, real-time content management with SuperSign Solution

4. Service Scene – Hallway

- Provide helpful information to the guests whilst improving the interior design.



Products & Solutions



Standard
Signage



Touch Signage
(KIOSK)



Ultra Stretch:
86" BH5C / BH7C / 88"
BH7D



SuperSign:
content management

Space characteristics

- Place leading the guest to hotel rooms and other accommodations
- Need to provide helpful information such as directory and way finding

LG's Solution

- Delivery of Information and advertisement through Standard Signage
- Interactive customer service with Touch signage (KIOSK)

5. Service Scene – Fitness Center

- Maximizes aesthetic and functionality of communal spaces with Digital Signage



Products & Solutions



Video Wall:
55VH7B /
VM5B
49VH7C /
VM5C



**Standard
Signage**



**Mirror
Signage**



SUPER SIGN SuperSign:
webOS content
management

Space characteristics

- One of critical places in the Hotel as today's guests prioritize well-being and wellness
- Need to create lively and active environment with entertaining yet helpful videos and content
- Interactive service may encourage the users

LG's Solution

- Delivery of lively videos with Ultra Narrow Bezel Video wall
- Interactive service with Mirror signage and touch signage
- Delivery of entertaining contents with various Standard Signages

6. Service Scene – Conference Center / Events

- Upgrade the overall spatial environment of large-scale events and conferences.



Products & Solutions



Video Wall:
55VH7B /
VM5B
49VH7C /
VM5C



LED Signage



**Transparent
Cooler**
49WEC



SuperSign:
content
management

Space characteristics

- Place where large scale events take place, thus overall interior design is critical
- In need of large display with wide viewing angle to deliver message efficiently in the large space

LG's Solution

- Improved delivery of information through LED Signage
- Creation of luxurious interior design with Video Wall
- Able to provide new and differentiated experience to the guests with transparent cooler
- Able to deliver messages effectively with Ultra Stretch Displays which can be installed at various spaces such as ceiling and pillars

7. Service Scene – Guest Room (Suite)

- Let the guests enjoy their stay with unique Hotel TV products and rich contents.



Products & Solutions



OLED/FHD TV



Pro:Centric SMART
Pro:Centric Direct Pro:Idiom



Wall Paper



Mirror Signage



SuperSign:
content management

Space characteristics

- Guests have high expectations for the room features and service as they paid much higher than standard room guests
- Need to provide the guests with luxurious interior design and cutting-edge technology
- Need to bring latest trend in the room, such as BYOD and OTT

LG's Solution

- Delivery of personalized messages and concierge services with Pro:Centric Smart/Direct
- Improved room interior design with Wallpaper OLED, known for its slim and sleep design
- able to provide interesting experience to the guests with Mirror Signage, which can be used both as a mirror and a display signage

7. Service Scene – Guest Room (Standard)

- Let the guests enjoy their stay with unique signage products and rich contents.



Products & Solutions



FHD/UHD TV



Pro:Centric.V
Pro:Idiom

Space characteristics

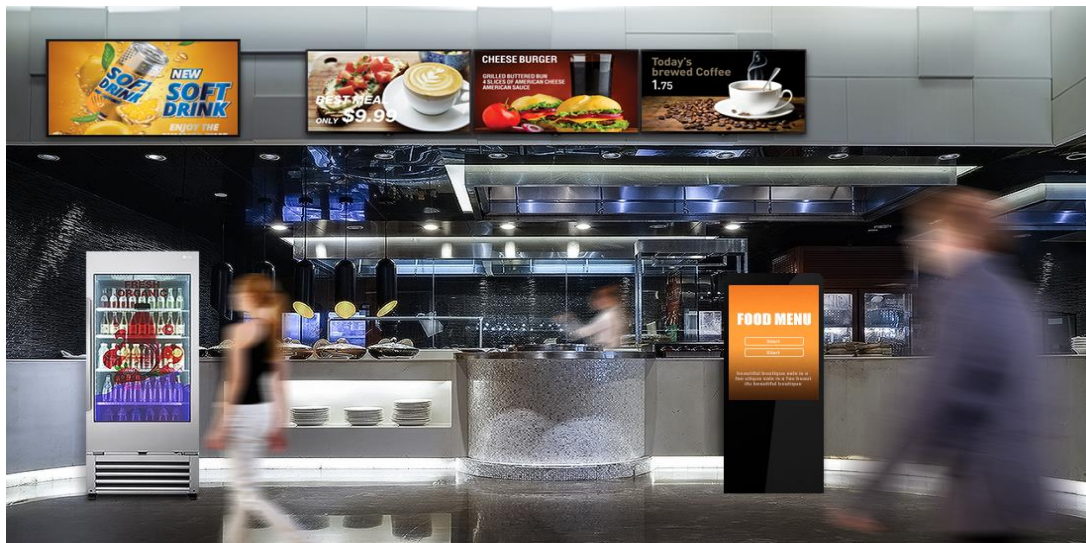
- Place where the guests spend most of his/her time
- Need to provide the guests with comfortable environment like home
- Need to let the guests enjoy their personal devices with BYOD and OTT features

LG's Solution

- Able to provide personalized service with Pro:Centric V
- Able to provide the guests the opportunity to connect their mobile devices to in-room TV with BYOD feature
- High quality Hotel TV such as OLED/FHD/UHD

8. Service Scene – Restaurant/Bar/Cafe

- Deliver the menu, price, promotions, and videos clearly to the guests.



Products & Solutions



OLED/UHD/FHD TV



Ultra Stretch:
86 BH5C / BH7C / 88 BH7D



Standard Signage



Transparent Cooler
49WEC

Space characteristics

- Need to ensure visibility of the menu, price, and promotional information
- Need to provide self-service options
- Need to fully utilize the limited space and provide visually interesting contents

LG's Solution

- Effective delivery of menu and price information using Standard Signage
- Able to provide self-service option with Touch Signage
- Able to create lively environment with high-quality TV Displays

9. Service Scene – Swimming Pool

- Provide vivid images at the outdoor swimming pool regardless of the ambient environment.



Products & Solutions



- **Outdoor Model:**
XF3C, XS2C,
49XS2B



- **Outdoor LED
Signage:**
LBS Series

Space characteristics

- In need of providing entertaining and informative visual media for the hotel guests at the outdoor pool
- Environmental factors such as sun light, temperature, humidity, rain, snow, and etc. should be considered in the space

LG's Solution

- LG Outdoor LED designed to be used 24/7, with a guaranteed lifetime of 100,000 hours with high brightness and vividness
- LG MRI ensures clear visibility in any conditions and guarantee 10 years lifetime
- Display manufactured with 7.5mm / 13.5 mm thick cover glass prevents damage from physical impact

Hotel Room Infotainment Solution

Pro: Centric Application



Project Editor



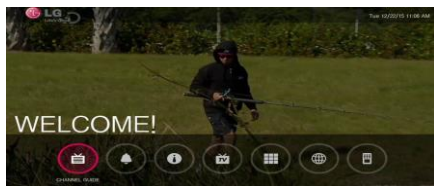
Theme Option (Cinematic)



Theme Option (Grid)



Theme Option (Bar)

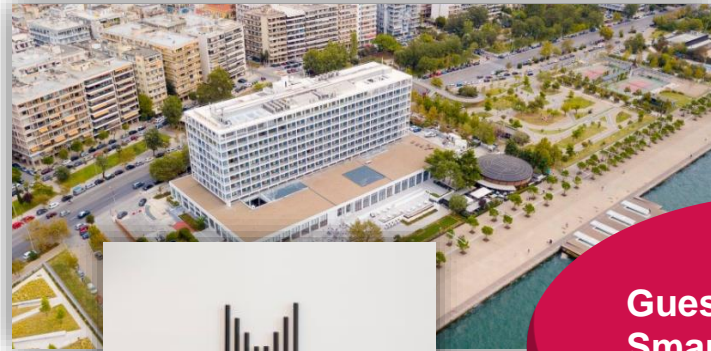


Hotel Room Infotainment Solution

Pro: Centric Solution




Hilton
ATHENS



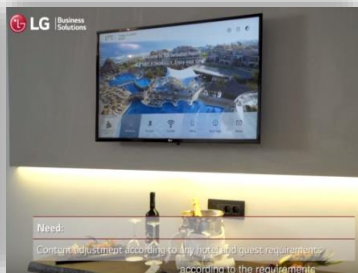

MAKEDONIA PALACE



**Guests Information
Smart TV
Management**

Hotel Room Infotainment Solution

Pro: Centric Direct solution



Hotel Room Infotainment Solution

Pro: Centric Direct solution



Air Conditioning & Hot Water Solutions

- What Are Visitors Expecting during their staying in Terms of Indoor comfort and design:

Guest Rooms



- Air conditioning in hotel rooms should **be quiet, easily adjustable**, comfort temperature Humidity, fresh air.
- Low-noise environment for maximum rest experience
- Simply control room temperature and Humidity
- Interactivity in using HVAC (Movement sensor, door opening etc)

Public Areas in a hotel



- Public areas are generally **the showcase of a hotel**. Special attention must be paid to HVAC

systems to be embedded **into the interior design and** architecture.

Indoor Units, Diffusers supply return, Air grilles etc must be **“invisible”**.

Water Heating



- Domestic hot water requirements are for guest room baths (tubs and showers, lavatories),
- Peak demand, usually from shower use, may last 1 or 2 hours and then drop off sharply. Food service, laundry, and swimming pool requirements are additive.

Air Conditioning & Hot Water Solutions

- Is It Possible to Reduce Costs while Adding Value to the Property?



Hotel Owner Expectations

“Low Cost”

- **Minimizing the total cost of ownership**
- Quick installation of facilities for fast remodeling
- Reducing the operational cost
- Durability and ease of maintenance

“Improved Value”

- **Comfortable building environment to attract and satisfy tenants**
- **High-quality interior & exterior design**
- **Optimized space usage**

MULTI V 5 VRF system Technology

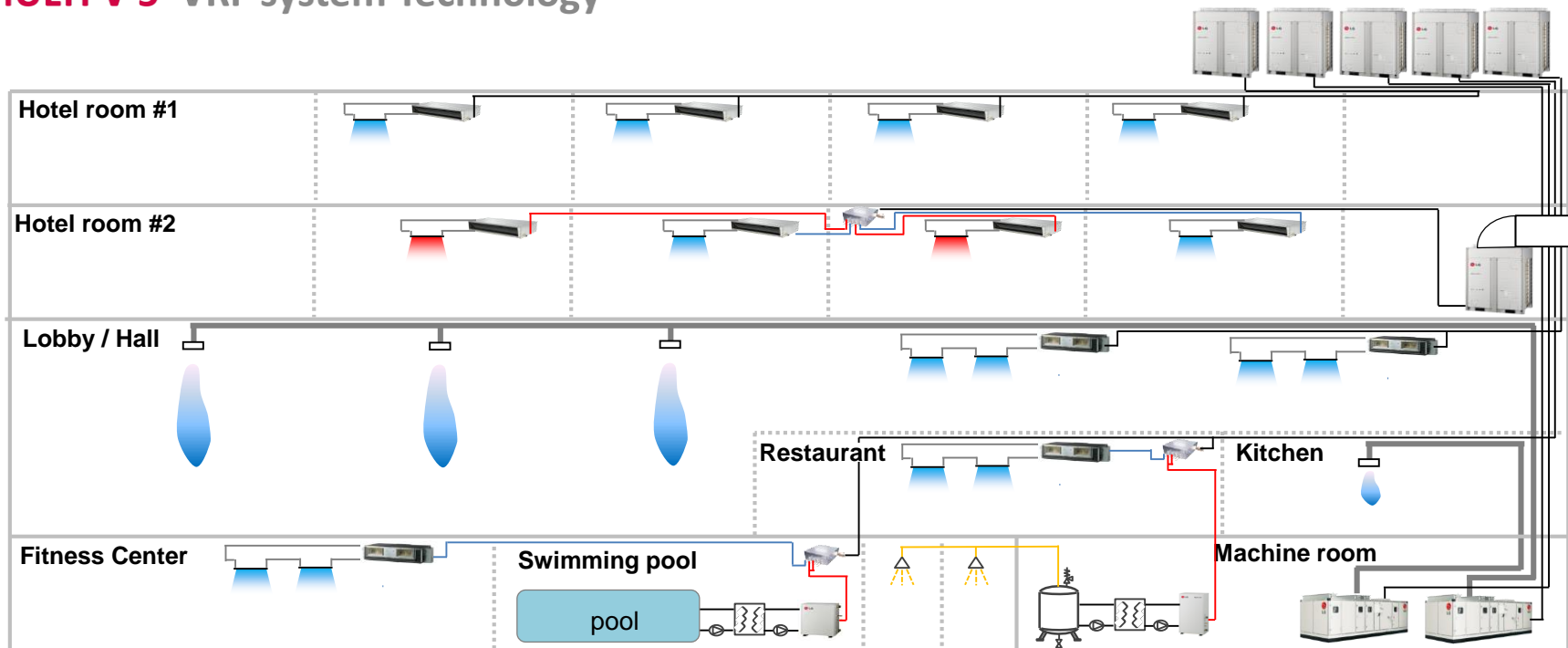
- Variable refrigerant flow (VRF) is an HVAC system **that individually controls the refrigerant amount according to air conditioning demands.** It connects various types of indoor units to a single outdoor unit. VRF enables **individually controlling the climate of hotel Rooms**
- **Combining the advantages of individual HVAC systems,** such as zone control, and central HVAC systems,
- With a VRF system, the climate of separate restaurants, conference rooms, and offices in office buildings **can be controlled individually.** In addition, the HVAC is less costly, more flexible to control, and simple to install.

Heat Pump Technology for DHW

- **Provides High temperature up to 80oC** applicable for hotels that require large amount of hot water supply.
- Very easy installation.
- Huge energy saving hot water production **vs.** Fossil fuels.
- Eco Friendly Green Energy Solution.
- Very High efficiency .

Air Conditioning & Hot Water Solutions

MULTI V 5 VRF system Technology



Air Conditioning & Hot Water Solutions

Heat Pump Technology for DHW

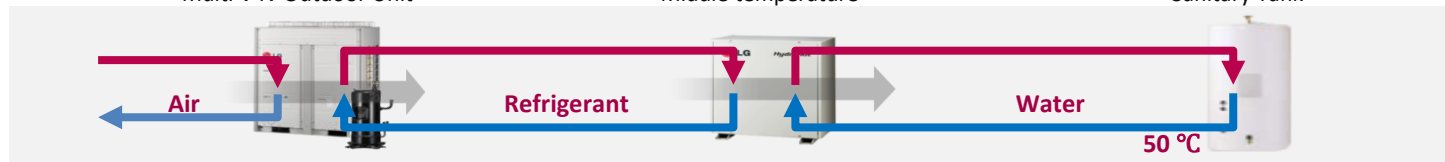


Hydro Kit (Middle temperature)

Multi V IV Outdoor Unit

Hydro Kit
Middle temperature

Sanitary Tank



Hydro Kit (High temperature)

Multi V IV Outdoor Unit

Hydro Kit
High temperature

Sanitary Tank



Air Conditioning & Hot Water Solutions



Low noise indoor unit, Simple controller for hotel guests, Fresh air, Infotainment experience

Ventilation (AHU)



Low noise indoor unit
(23 ~ 39dB(A))



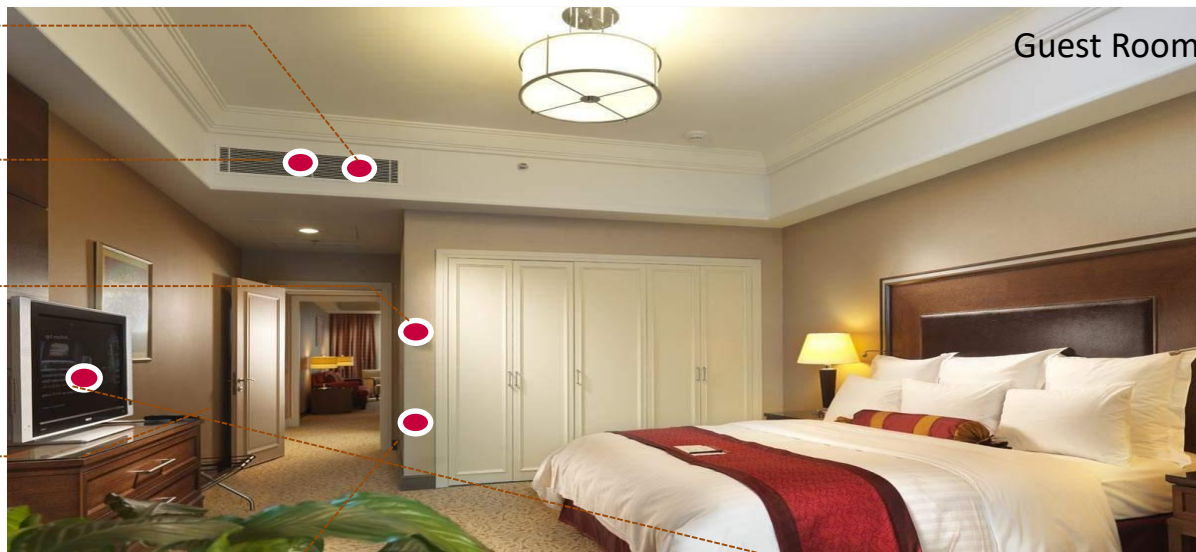
Simple controller



Dry contact (for a card key)



Refrigerant leak detector
(Optional)



Guest Room



Procentric V

More efficient HVAC systems are required to significantly reduce energy consumption and to meet energy regulations.



Efficiency

- EU enforces energy efficiency
 - HVAC composes more than 50% of a building's energy consumption
-



Electricity cost saving

- Climate change increases HVAC usage
 - Electricity prices are constantly rising
-



Comfort

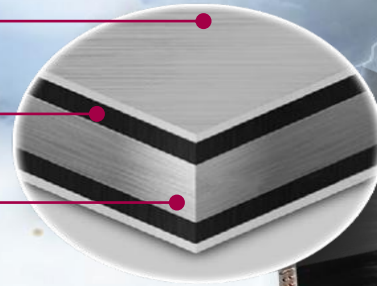
- For a comfortable environment, humidity has to be considered

LG's exclusive "Ocean Black Fin" heat exchanger is designed for Improved Corrosion Resistance.

Ocean
Black Fin

Ocean Black Fin

- **Hydrophilic film (Water flow) $0.2 \sim 0.3\mu\text{m}$**
The Hydrophilic coating minimizes moisture buildup on the fin.
- **Epoxy resin (Corrosion resistant) $1.6 \sim 2.0\mu\text{m}$**
The Black coating provides strong protection from corrosion
- **Aluminum Fin**
- Certified protection



- Test Method B Simulation Validated
- Test condition: Salt contaminated condition
+ severe industrial/traffic environment(NO2/SO2)
- * Based on 1,500 UL test hours



Hot Water Solution

HYDRO KIT, using MULTI V to provide floor heating and hot water supply as a total HVAC solution.



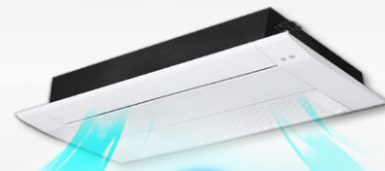
MULTI V 5
Outdoor Unit



Indoor Unit

HR Box

HYDRO KIT



Cooling



Heating



Hot Water



LG

Business
Solutions



Features

- Single HYDRO KIT provides **Max. 80°C** water
- Saving Cost through High efficient operation up to **41%**
 - * Electricity cost : 0.063 € per kWh / LNG cost : 0.107 € per kWh (2015, Spain)
 - * HYDRO KIT COP : 3.75 / Boiler using fossil fuel : 87%
- Energy Saving through MULTI V Heat Recovery

Air Conditioning & Hot Water Solutions

Central Controller AC SMART BACNET IV



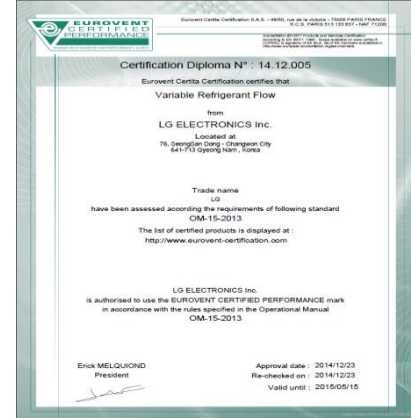
- Multiple control functions
- **Set-up min & max temperature** (avoid over-heating / cooling spaces)
- **Lock function of IDU running mode** (temperature, fan speed, star/stop)
- Embedded **Bacnet Gateway** for immediate connection with the BMS (Building Management System) for easy control.

LG HVAC : Eurovent Certification

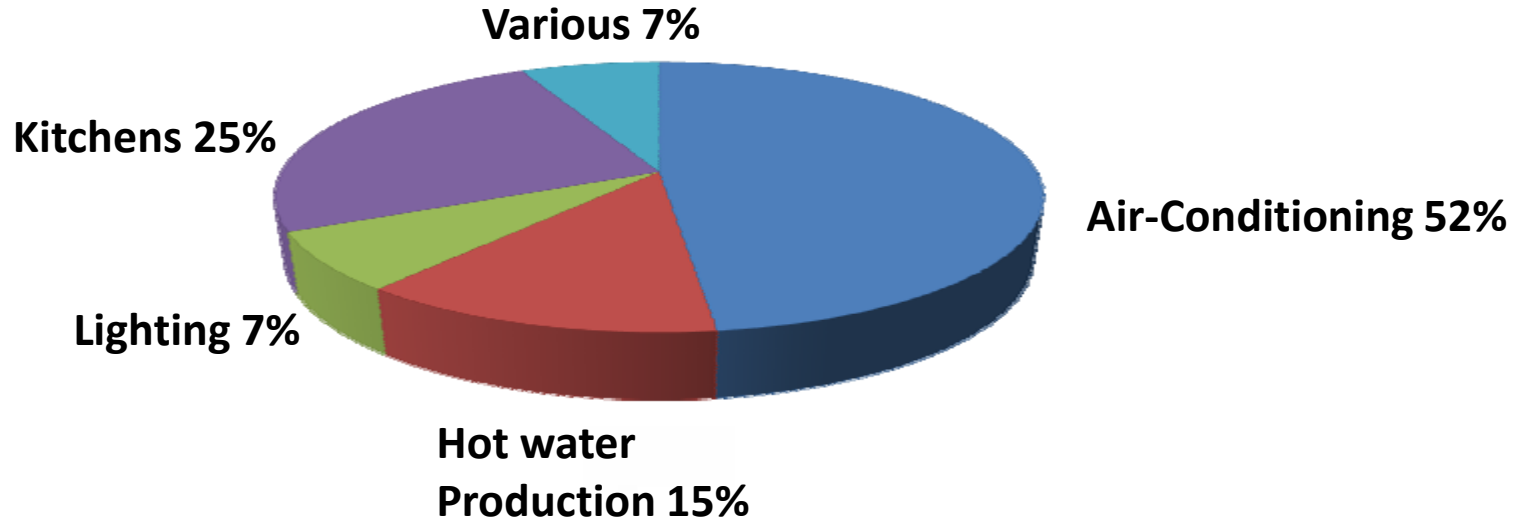


Certified performance items are:

1. Outdoor cooling capacity at standard conditions
2. Outdoor heating capacity at standard conditions
3. EER: Outdoor Energy Efficiency Ratio in cooling
4. COP: Outdoor Coefficient of Performances in heating
5. A-weighted sound power level outdoor side



Main Hotel Energy Demands



Depending on the units we can have a reduction in operation cost up to :

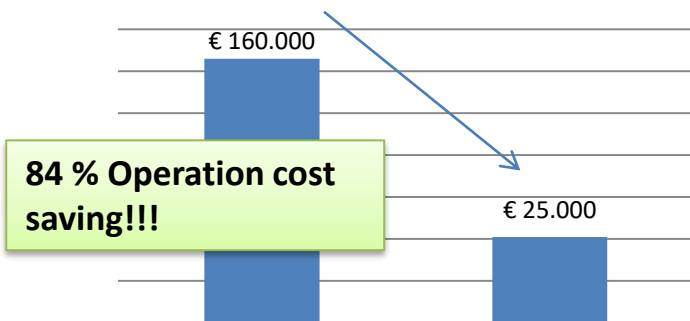
- -65% in air-conditioning
- -85% in hot water production
- -60% in lighting.

Air Conditioning & Hot Water Solutions

Hot Water energy saving case study



First year Cost Energy saving
€135.000 ,00



Rodos Maris

Pay back Period less than two (2)years

- 1200 Beds
- Water storage 40.000 lt in 65o C
- LPG Gas Boiler replacement
- Hotel operation:180 days
- Target: To reduce the total operation cost for domestic hot water.

Energy consumption results

2016 (LPG Amount)	2017 (Electricity Amount)
€160.000	€25.000

Air Conditioning & Hot Water Solutions

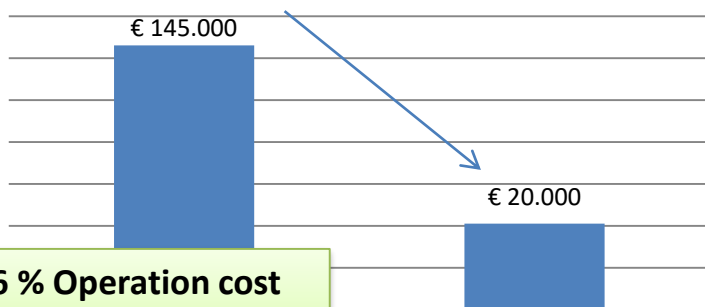
Hot Water energy saving case study



Rodos Village

- 1100 beds
- Water storage 30.000 lt in 65o C
- LPG Gas Boiler replacement
- Hotel operation: 180 days
- Target: To reduce the total operation cost for domestic hot water.

First year Cost Energy saving
€125.000 ,00



86 % Operation cost saving!!!

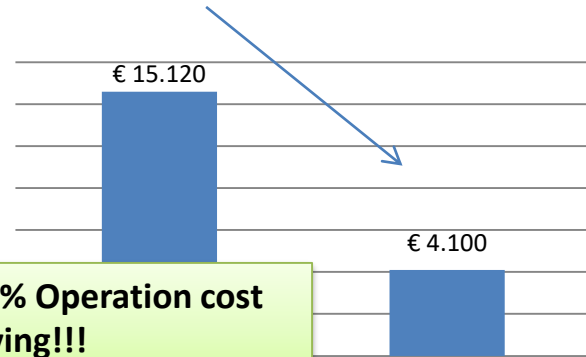
2016(LPG Amount)	2017(Electricity amount)
€145.000	€20.000

Air Conditioning & Hot Water Solutions

Hot Water energy saving case study



First year Cost Energy saving
€11.020,00



73 % Operation cost saving!!!

Blue Lagoon Resort

- 200 Beds
- Daily demand in hot water 10.000 lt.
- Gas Boiler replacement
- Hotel operation: 180 days
- Target: To reduce the total operation cost for domestic hot water.

2014 (Oil Amount)	2015(Electricity Amount)
€15.120	€4.100

Air Conditioning & Hot Water Solutions

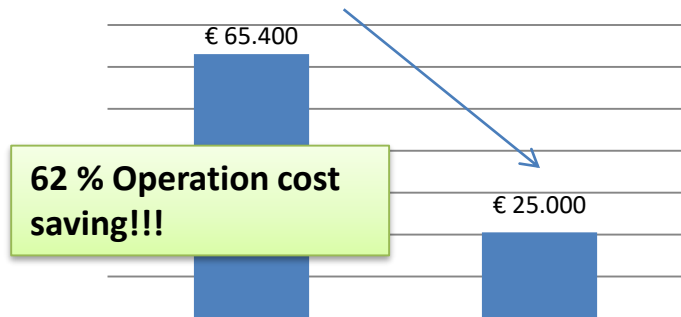
Air Conditioning energy saving case study



Atlantica Aegean View

- Split Room air conditioning replacement with VRF MULTI V
- 252 Rooms cooling capacity 12,000 btu/h
- Hotel operation: 180 days
- Target: To reduce the total operation cost for domestic hot water.

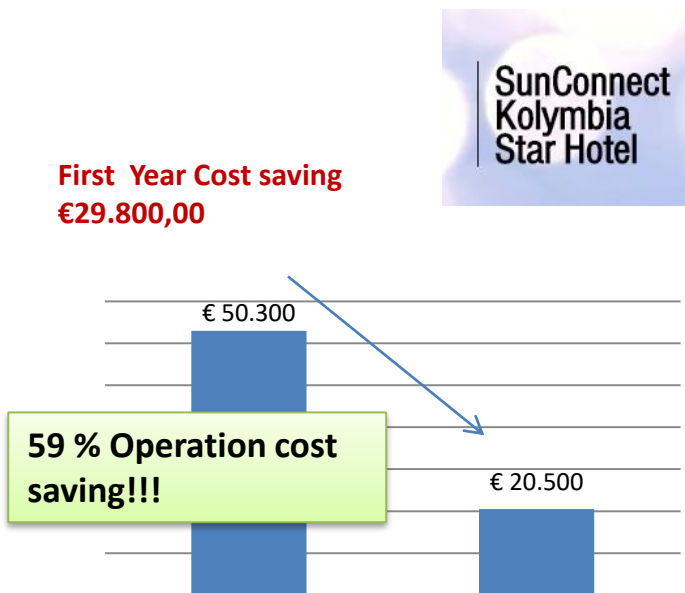
First Year Cost saving
€40.400,00



2016(Electricity Amount)	2017(Electricity Amount)
€65.400	€25.000

Air Conditioning & Hot Water Solutions

Air Conditioning energy saving case study



Kolymbia Star

- Split Room air conditioning replacement with VRF MULTI V
- 194 Rooms Cooling Capacity 12.000btu/h
- Hotel operation: 180 days
- Target: To reduce the total operation cost for domestic hot water

2016(Electricity Amount)	2017(Electricity Amount)
€50.300	€20.500

Thank you