

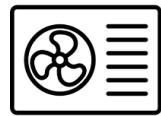


**ENERGY EFFICIENCY FIRST:  
FROM ENERGY EFFICIENCY PROJECTS UP  
TO ENERGY SAVING AND ECOLOGICALLY  
FRIENDLY EXPLOITATION**

# Main directions of our activity

- Turnkey energy efficient projects
- Commissioning of engineering systems

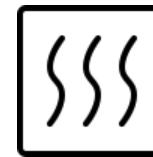
for next systems:



Air  
conditioning



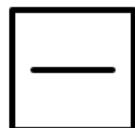
Ventilation



Heating



Heat  
recovery



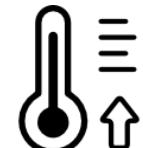
Drying



Humidification



Cold supply



Hot water  
supply

A photograph of a large industrial facility, likely a chemical or petrochemical plant. The image shows several large, white, cylindrical storage tanks in the foreground and middle ground. In the background, there are tall, light-colored industrial buildings with multiple levels and walkways. The sky is a clear, pale blue. The overall scene conveys a sense of industrial scale and modern infrastructure.

TURNKEY ENERGY EFFICIENT PROJECTS

# Benefits of developing integrated engineering projects with our company



## Optimize costs

Optimize capital costs and offer systems with guaranteed energy efficiency



## Minimizing engineering risks

ready to predict operating costs and therefore calculate the payback period of various energy-saving systems



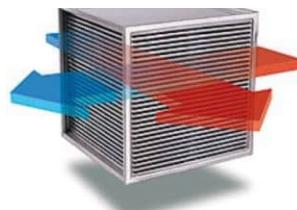
## We create projects with an optimal price / quality ratio

We use an integrated approach to the design of various engineering systems in order to optimize the capital and operating costs of the Customer

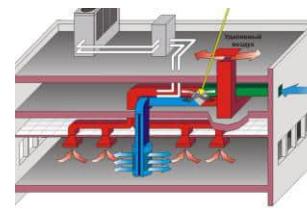
# When designing systems we use advanced technology:



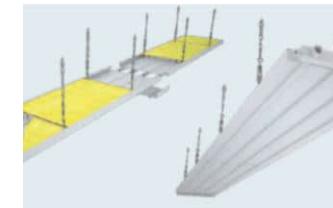
Heat pumps



Air heat exchangers



Water heat exchangers



Water Infrared Heating and Cooling System



Free cooling systems



Variable air flow ventilation systems



Heat and cold storage systems



Heat Recovery Systems in Cooling Systems

# Examples of projects

## CONFECTIONERY FACTORY ROSHEN IN VINNITSA (UKRAINE)



### SYSTEM DATA

- HVAC and cooling systems
- Workshop area – 10 800 m<sup>2</sup>
- Ventilation capacity – 425 000 m<sup>3</sup>/hour
- Cooling capacity – 4 280 kW

## CIGARETTE FACTORY PHILIP MORRIS IN KHARKIV (UKRAINE)



### SYSTEM DATA

- HVAC
- Explosive production
- Ventilation capacity – 9 000 m<sup>3</sup>/hour
- Using heat pump and free cooling mode

# Examples of projects (2)

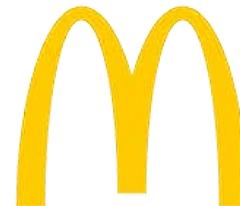
**PJSC «KOZIATYN SKYI MIASOKOMBINAT»  
(MAJOR SUPPLIER OF BEEF FOR THE  
CHAIN OF RESTAURANTS MCDONALDS)  
IN KOZIATYN (UKRAINE)**

## SYSTEM DATA

- HVAC and cooling systems
- Workshop area – 1 200 m<sup>2</sup>

## PROJECT RESULTS

- The project was designed and implemented for 25 rooms with temperatures from -25°C to +12°C



**KRIUKIV RAILWAY CAR  
MANUFACTURING PLANT IN  
KREMENCHUK (UKRAINE)**

## SYSTEM DATA

- Heat Pump Water Heating System 605 kW
- Daily hot water consumption - 68 m<sup>3</sup>
- Peak hourly consumption - 18 m<sup>3</sup> /h
- The maximum difference in hot water heating is 53°C (from + 7°C to +60°C)

## PROJECT RESULTS

- A system for reheating hot water using a water-to-water heat pump was designed and put into operation
- Reduced cost of hot water preparation
- Reduced gas consumption and complete refusal of gas in the summer
- Payback period of project – 8 month



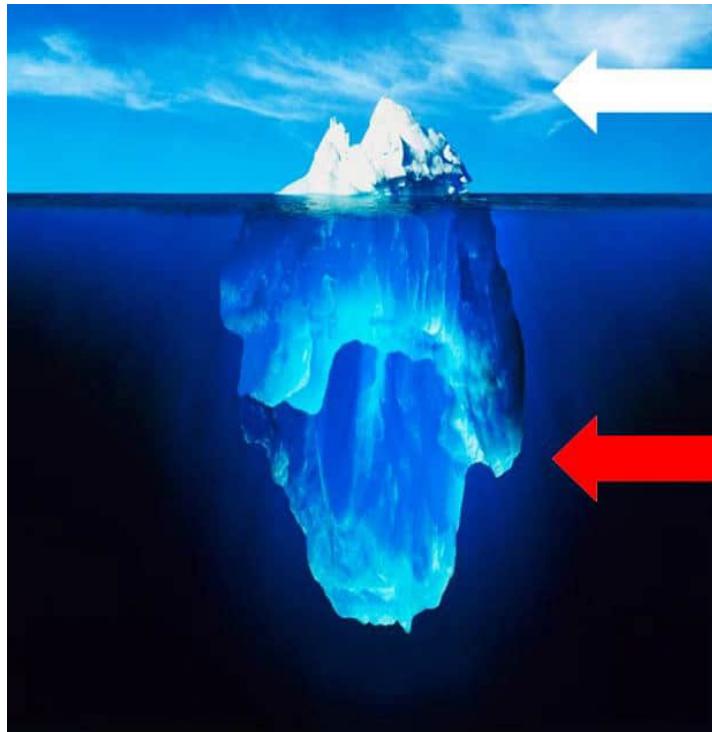


# COMMISSIONING (DIAGNOSTICS) OF ENGINEERING SYSTEMS BUILDING AND ENTERPRISES

# WHY COMMISSIONING?

## CONTINUOUS COMMISSIONING

- is an ongoing process to resolve operating problems, improve comfort, optimize energy use and identify retrofits for existing commercial and institutional buildings and central plant facilities.



VISIBLE PROBLEMS

INVISIBLE PROBLEMS

CONTINUOUS COMMISSIONING  
(trademark registered by A&M Texas University)



# How we are working?



## We carry out commissioning of the main energy-consuming systems

When analyzing the engineering systems of a particular building, we determine the main energy-consuming systems to which we install the sensors, and in real time transmit the necessary data on their state

## Define "low hanging fruit"

On the basis of the data obtained, we form a list of free or low-cost activities that allow in the shortest time to reduce the costs of energy consumption of enterprises

## We provide the implementation of solutions to reduce energy consumption

on the basis of decisions agreed with the Customer and adopted for implementation, optimizes engineering systems and confirm the estimated payback period

# The main advantages of commissioning (diagnostics)



**Short time for commissioning**



**Minimum load for customer's employees**



**Quick return on investment**



**Switch to preventive maintenance**



**Reducing the likelihood of emergency situations**

# Commissioning of engineering systems of enterprises

**12**  
years on the market

**105**  
completed  
commissioning projects

**650 000 € +**  
saved by our clients over  
the past 5 years due to the  
implementation of energy  
efficient solutions

# Examples of projects

## PEPSICO FACTORY IN KHARKIV (UKRAINE)



### SYSTEM DATA

- Refrigeration unit
- Cooling capacity – 236 kW
- Workshop area – 2 700 m<sup>2</sup>

### RESULTS OF COMMISSIONING

- Inefficient operation of the economizer
- Inefficient operation of condensers
- Increased energy consumption of compressors

## SWIMMING POOL OF THE OLYMPIC SPORTS CENTER IN RIGA (LATVIA)



### SYSTEM DATA

- Air handling units with inside dehumidifiers - 2 units
- Area - 760 m<sup>2</sup>
- Air volume exchange – 24 000 m<sup>3</sup>/hour

### RESULTS OF COMMISSIONING

- Optimization of volume of external air
- Re-adjustment of the dehumidifiers
- Adjustment of the exhaust ventilation systems
- Energy saving - minimum 17-22% of annual consumption

# Examples of projects (2)

## SHOPPING MALL RAJON IN KYIV (UKRAINE)



### SYSTEM DATA

- HVAC and cooling systems
- The total area is 66,000 m<sup>2</sup>

### RESULTS OF COMMISSIONING

- Exceeding the optimal temperature level of 23°C...25°C throughout the mall
- Inefficient cold water temperature control algorithm
- Increased electricity consumption by chillers

## THE HOTEL IN THE SUBURBS OF LONDON (GREAT BRITAIN)

### SYSTEM DATA

- DHW system with gas boiler
- Problems with hot water during peak morning hours

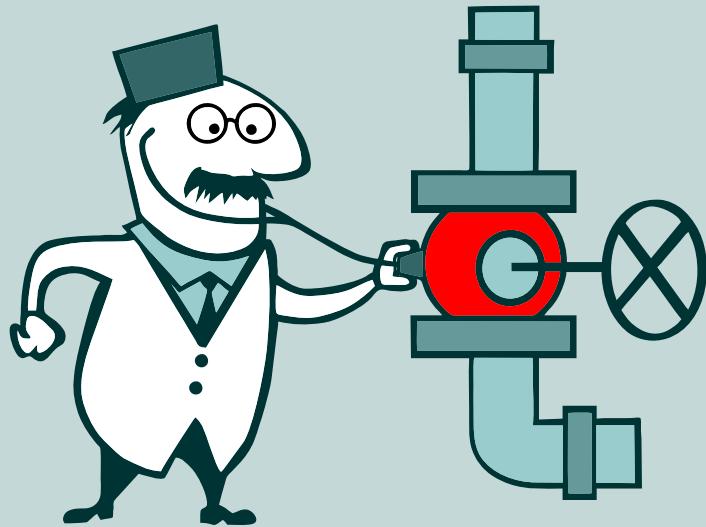
### RESULTS OF COMMISSIONING

- The problem is not in the gas boiler (customers two times changed it), but in water-to-water heat exchangers

# NEW OPPORTUNITIES IN COOLING ENERGY EFFICIENCY



# FIRST STEP IN COOLING ENERGY SAVING



## ONLINE MONITORING & COMMISSIONING

*- direction #1 with minimum terms of returning funds to energy saving*

COMMISSIONING ON THE BASIS OF MONITORING - DIRECTION #1

*(SIEMENS «TOP 10 ENERGY SAVING OPTIONS», 2016)*

**#1**



LOOKING FOR (HUNTING)  
"LOW-HANGING FRUITS"



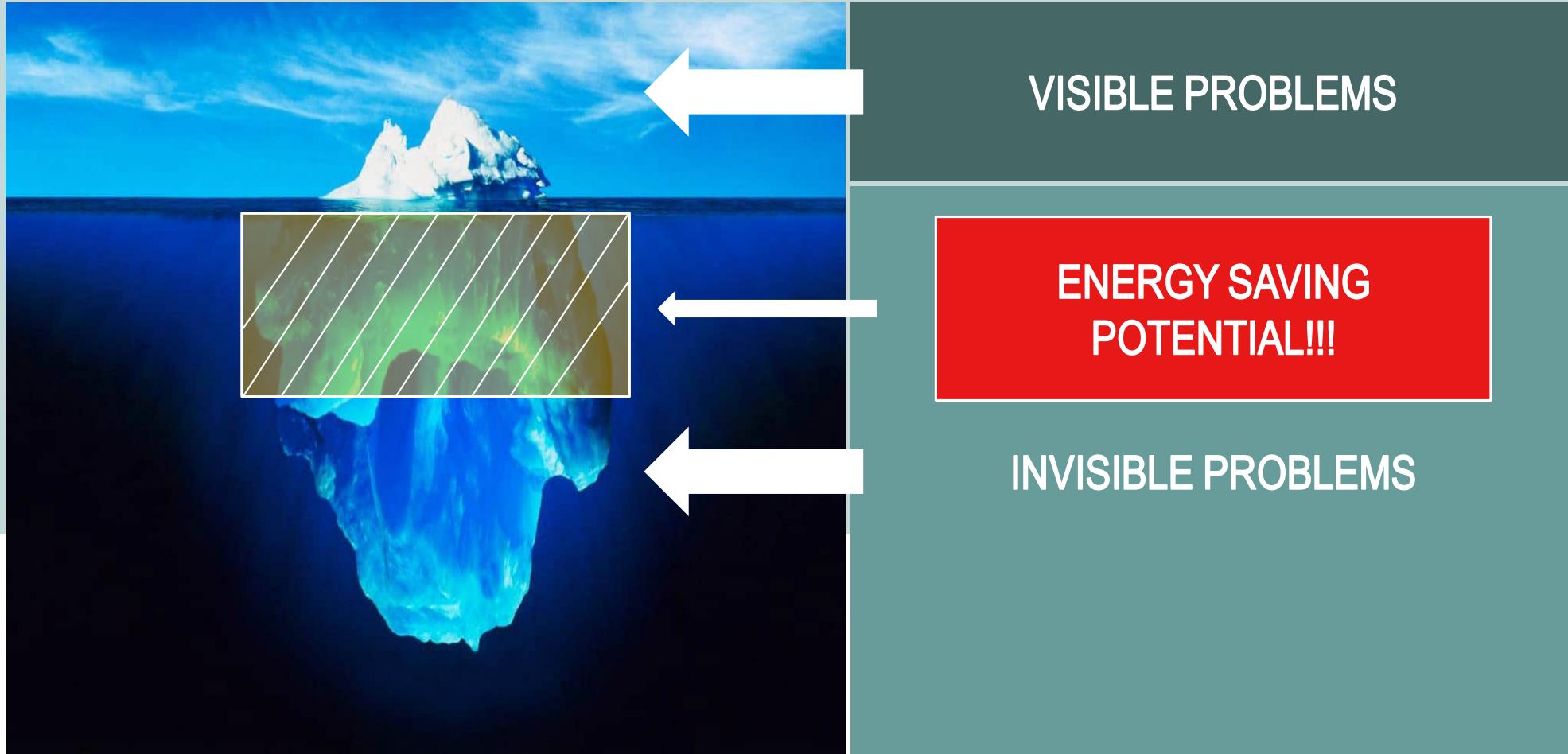
"LOW COST"

"NO COST"

THE MAIN TASK OF COMMISSIONING IS TO IDENTIFY, IMPLEMENT AND VERIFICATE  
LOW-COST / NO-COST ENERGY SAVING MEASURES

*«low-hanging fruit» –  
something that is easy to  
get, achieve or take  
advantage*

# WHY COMMISSIONING?



# COMMISSIONING OPTIONS

COMMISSIONING



ENERGY AUDIT

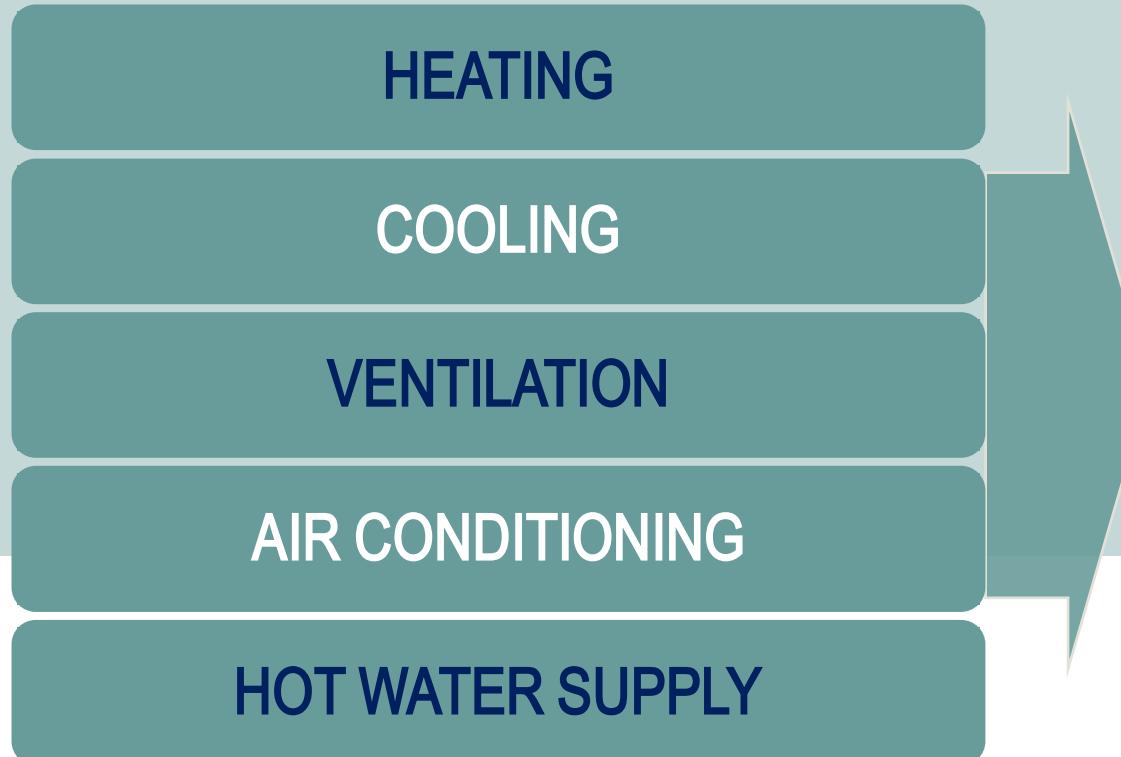
ONLINE MONITORING



ENERGY MANAGEMENT



# OBJECTS OF DIAGNOSTICS CAN BE ENGINEERING SYSTEMS:



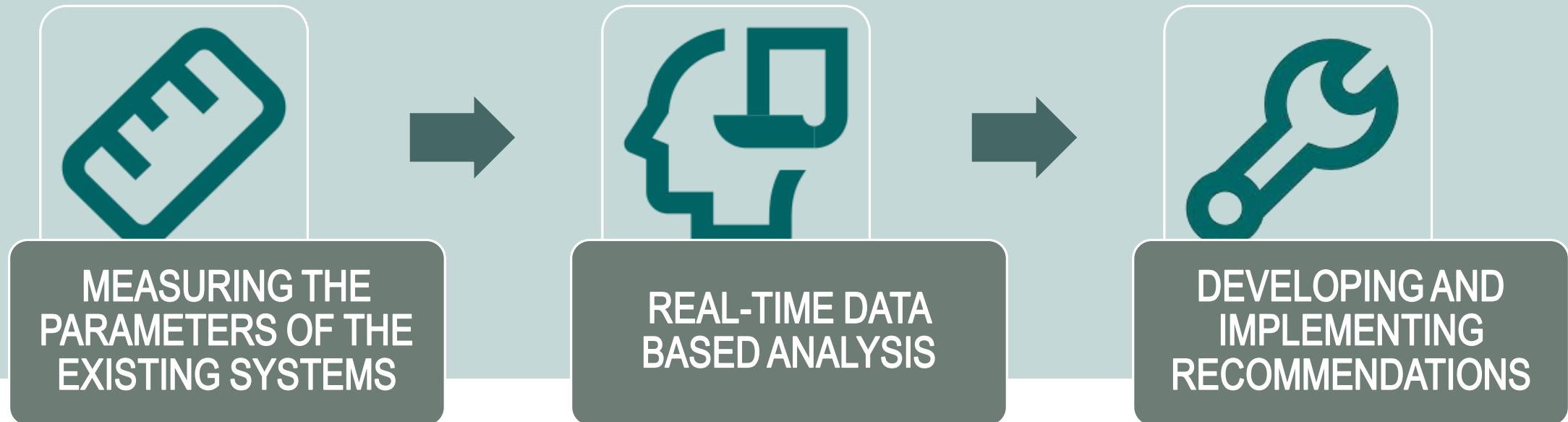
From 45% to 85% of the  
enterprise's energy  
consumption



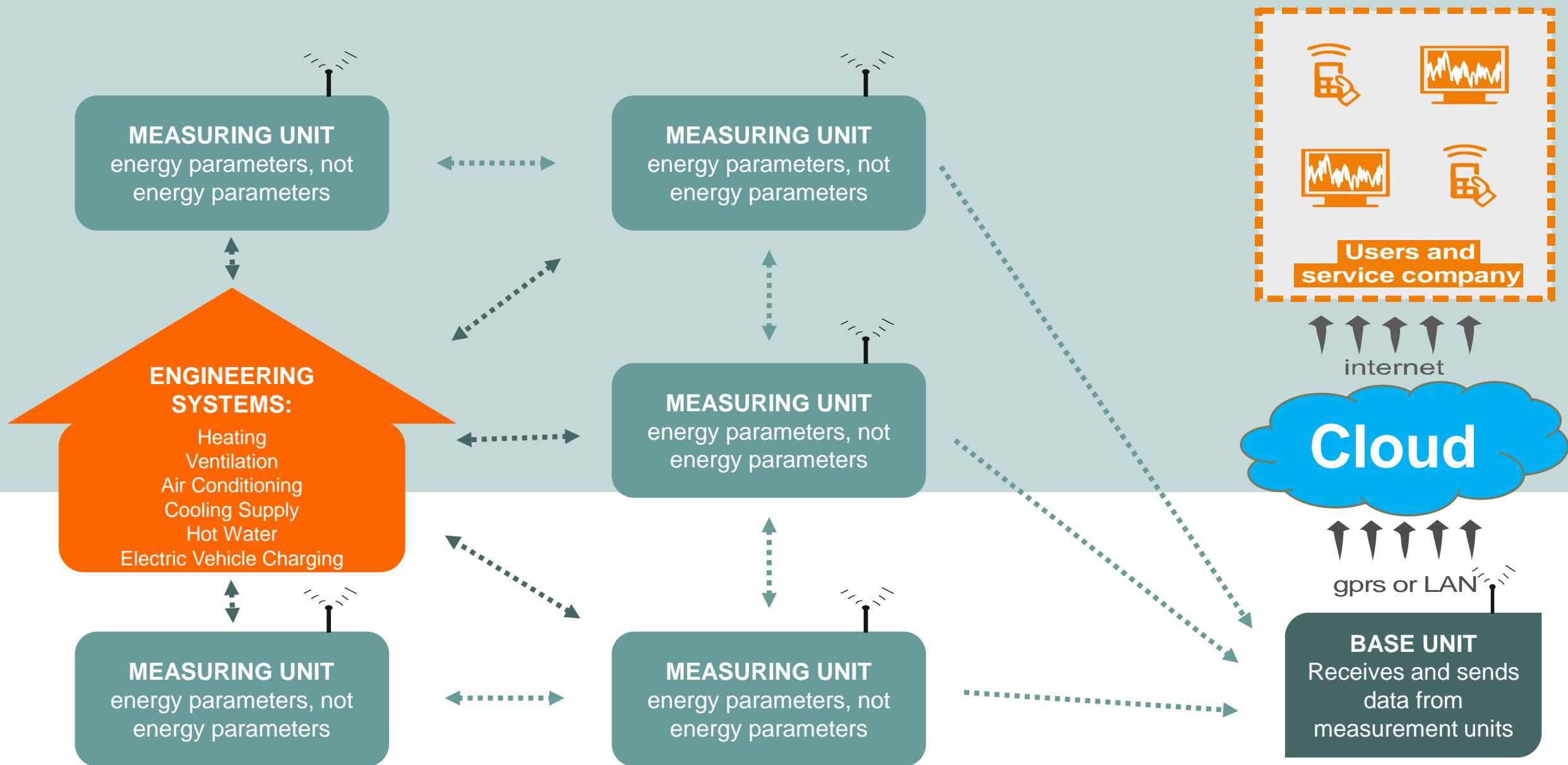
«ONE ACCURATE MEASUREMENT IS WORTH A THOUSAND EXPERT OPINIONS»

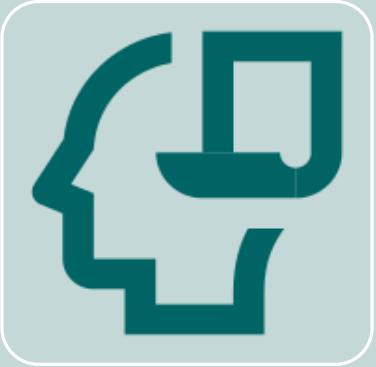
*Grace Hopper - pioneering computer programming*

# OUR SKILLS



# SMART TELEMETRY & SERVICE - a new approach to the organization of maintenance and service cooling systems using the Internet of Things( (IoT) and Cooling Efficiency as a Service (CEaaS).





**SOME OF OUR REFERENCE CASES  
“COOLING EFFICIENCY AS A SERVICE”**

 INSOLAR  
climate

# FOOD ENTERPRISE COOLING AND VENTILATION SYSTEMS

## SYSTEM DATA

- Refrigeration capacity - 1040 kW
- Workshop area - 2700 m<sup>2</sup>

## RESULTS OF COMMISSIONING

- Identified capacity failure in fan management
- Corrected this and other issues
- Reduced energy consumption by 30%
- **PAYBACK PERIOD ≈ 1 MONTH**



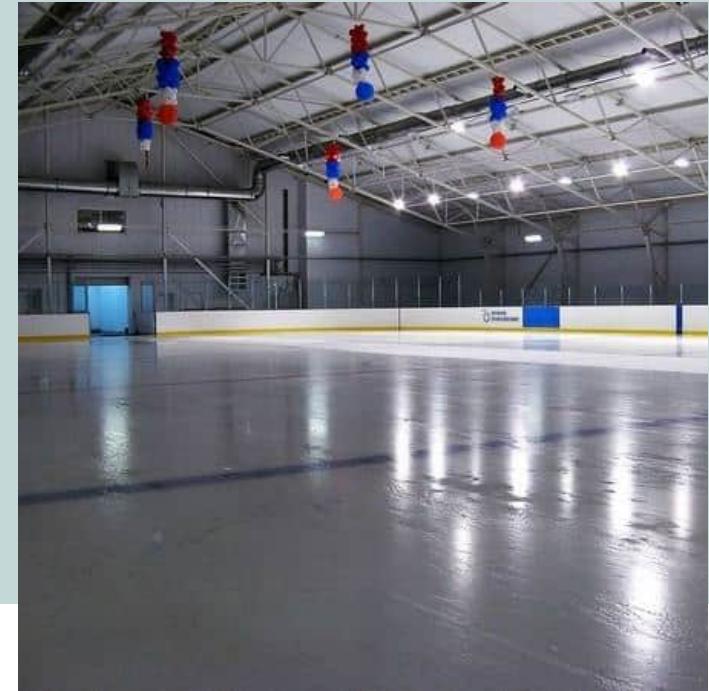
# ICE RINK COOLING SYSTEM

## SYSTEM DATA

- Refrigeration capacity - 220 kW
- Ice rink area - 1800 M<sup>2</sup>

## RESULTS OF COMMISSIONING

- Reduced energy consumption by 35%
- **PAYBACK PERIOD ≈ 2 WEEKS**



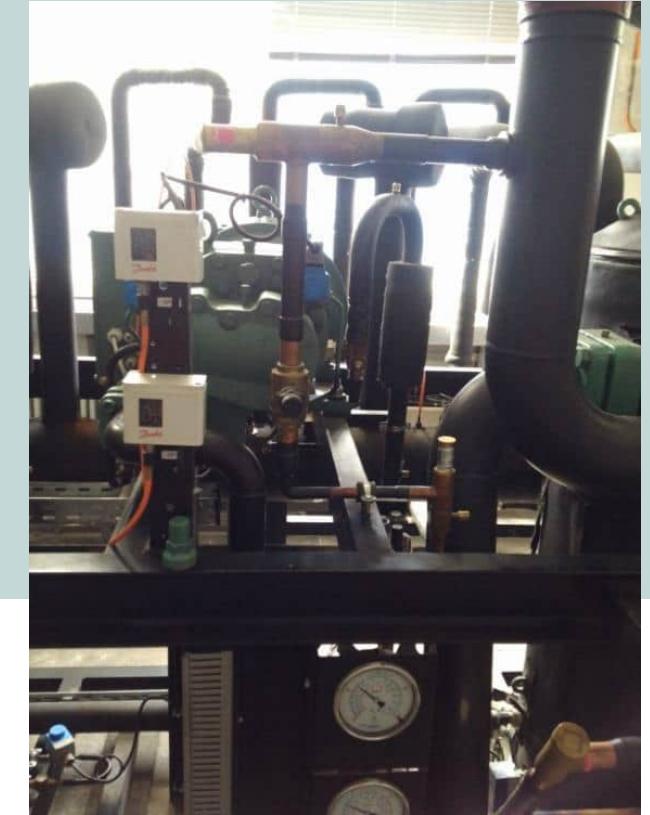
# MILK PROCESSING PLANT REFRIGERATION STATION

## SYSTEM DATA

- Refrigeration capacity - 236 kW
- Refrigerator temperature +2...+4°C

## RESULTS OF COMMISSIONING

- Thermostatic expansion valve setting problem
- Oil circuit problem
- Inefficient work of the economizer
- Inefficient operation of capacitors
- Increased energy consumption of compressors
- **PAYBACK PERIOD ≈ 2 MONTH**



# ROOFTOP-BASED SHOPPING MALL AIR CONDITIONING SYSTEM

## SYSTEM DATA

- Mall area – 38 500 m<sup>2</sup>

## RESULTS OF COMMISSIONING

- Different freon quantity in the rooftop circuits
- Low temperatures of evaporation
- Incorrect work of the economizer
- Increase in energy efficiency by 30%
- **PAYBACK PERIOD ≈ 5 MONTH**



# POTENTIAL ENERGY SAVING FROM COMMISSIONING PROCEDURES

**FROM 10 TO 30% OF ANNUAL  
POWER CONSUMPTION**

