



# Energy demand-side management: which actions to improve Energy Efficiency in buildings? (Example Hungary)

Csaba Demzse



# Table of contents

- Example in Hungary
- Condition precedent for performance contracting

# Example: Hospital of Szombathely\* city

## ■ General overview

- Foundation year: 1919
- Number of beds: 1309 beds
- Heated air-space: 233.994 m<sup>3</sup>
- Domestic hot water need: 122 m<sup>3</sup>/day
- Technological steam need: 4,9t/h

## ■ Legal environment

- In Hungary there is an adequate legislation background for energy performance contracting

## ■ Commitment

- The owners of hospital were strong committed to improve the energy efficiency of the hospital
- Willingness to outsource the heat supply of the building



\*Szombathely: city in West Hungary (80.000 inhabitants)

# Example: Hospital of Szombathely city

- **Technical and technological situation before investment**
  - Aging equipment: 5,24 MW steam boiler (12 years old), 8,9 MW steam boiler (18 years old), 8,9 MW steam boiler (23 years old)
  - Obsolete heating technology: heating system based on steam, lack of automated heating control in function of weather condition, recurring maintenance problems
  - Fuel: heating oil
- **Financial situation of the hospital**
  - Lack of funding capital
  - High maintenance and energy costs
- **Human resources situation of the hospital**
  - Little energy engineering skills of the employees

# Example: Hospital of Szombathely city

## Action taken by the hospital

### ■ Team assembling

- The hospital assembled a team (maintenance, financial, legal and procurement staff) in order to explore the possibility of performance contract

### ■ Development of a facility profile

- Description of hospital's buildings (classification by uses, sizes (m<sup>2</sup>), beds or number of visits, etc.), energy use, equipment, operating schedule, maintenance problems, etc.
- Definition of required temperature and humidity by building
- Collection of the utility bills for the past three years

# Example: Hospital of Szombathely city

## Action taken by the hospital

- Development of a request for proposals based on lump-sum contract and invited ESCOs to tour the facility and to respond
- Organization of the public procurement tender
- Evaluation of the proposals and selection of the best ESCO

# Example: Hospital of Szombathely city

## Action taken by the hospital

- Energy performance contracting
- Surveillance of the implementation of the energy efficiency improvement measures
- Surveillance and monitoring of the supplied services
- Measurement and evaluation of the results

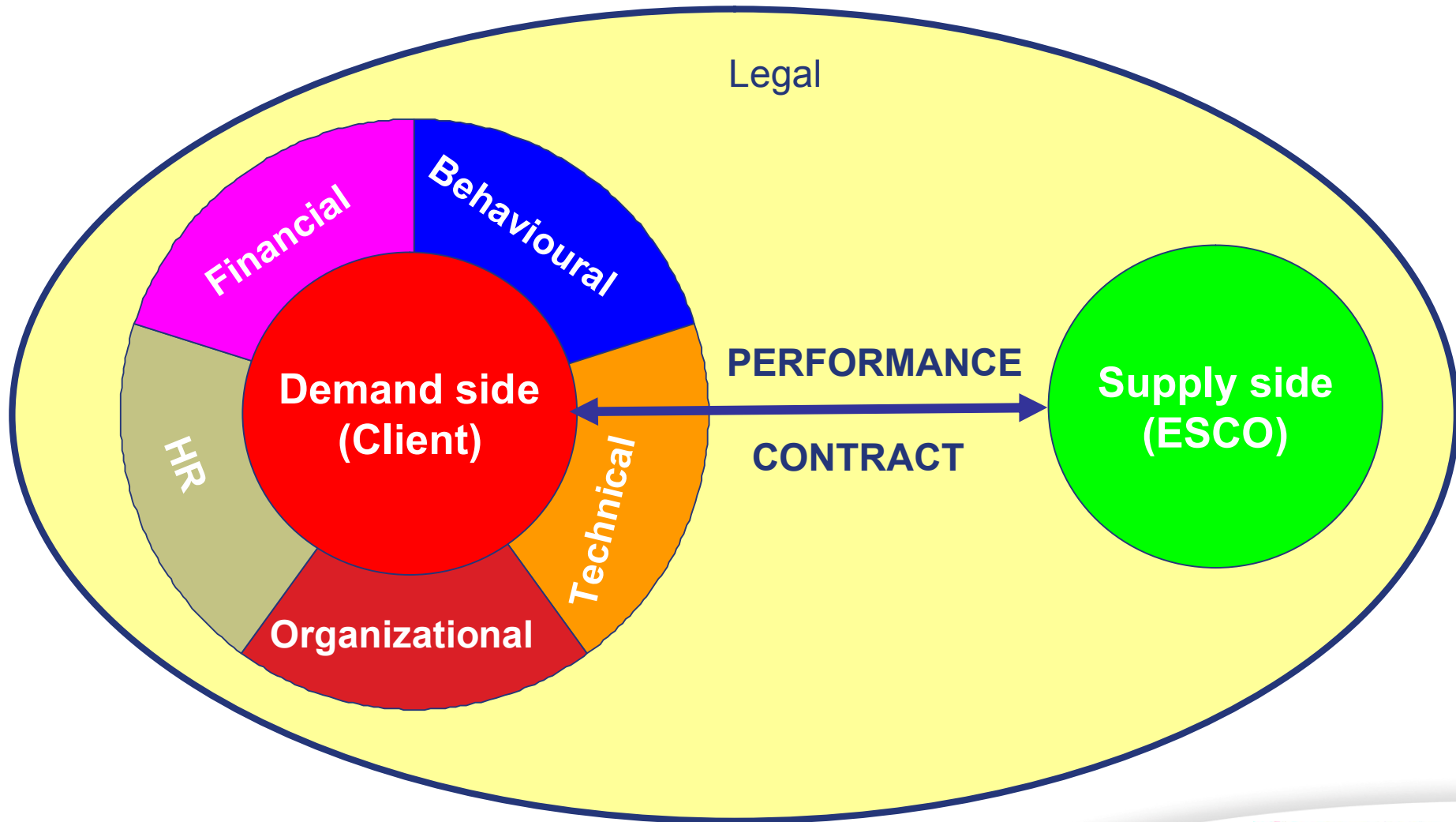
# Example: Hospital of Szombathely city

## Situation after reconstruction

- Energy efficiency improvement measures implemented by ESCO
  - Change of steam based heating to warm water based heating
  - Change over from heating oil to natural gas
  - Replacement of two older steam boilers with two warm water boiler (3,37 MW capacity each)
  - The third steam boiler was converted to warm water boiler
  - Build in a 500 kW power capacity gas engine
  - Build in of automated control system

The result: 40% energy savings and 45% cost savings

# Condition precedent for performance contracting



# Condition precedent for performance contracting

- **Legislation conditions (essential condition)**
  - Favourable legal background for performance contracting
- **Behavioural conditions (essential condition)**
  - Strong commitment to improve energy efficiency of the building at senior management level
  - Willingness to outsource the energy supply of the building
- **Technical and technological conditions**
  - Aging buildings and equipment
  - Recurring maintenance problems
  - Obsolete heating technologies

# Condition precedent for performance contracting

## ■ Financial conditions

- Lack of funding capital
- High energy costs
- High maintenance and operation costs

## ■ Human resources conditions

- Lack or little energy management skills
- Lack or little energy engineering skills
- Lack of manpower or management time

# Condition precedent for performance contracting

## ■ Organisational conditions

- Team assembling and development of a facility profile
- Development of a request for proposals based on lump sum contract and invitation of ESCOs to tour the facility and to respond
- Organisation of the public procurement tender
- Evaluation of proposals and selection of the best ESCO
- Energy performance contracting
- Surveillance of the implementation of the energy improvement measures
- Surveillance and monitoring of the supplied services
- Measurement and evaluation of the results