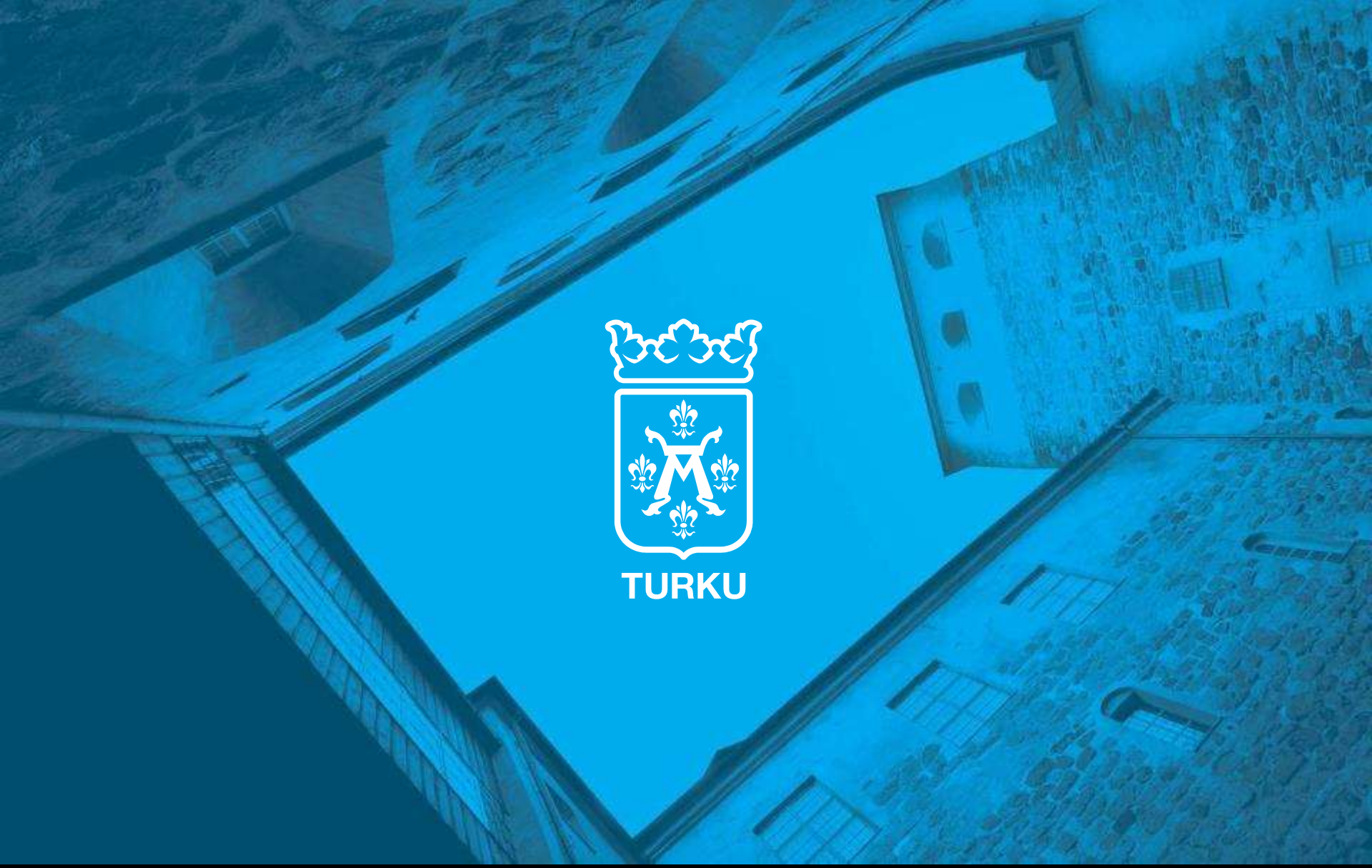

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Turku – The Oldest City in Finland

Turku is Finland's historical centre for culture and education

- The oldest city in Finland (founded in 1229)
- The first capital city of Finland (1809-1812)
- The first university in Finland, Turun akatemia (Academia Aboënsis), was founded in 1640
- Three universities and four universities of applied sciences

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Population

- Inhabitants in Turku 180 000, 6th biggest city in Finland
- Turku Region ca. 300 000
- A bilingual city, Swedish-speaking inhabitants approx. 5 %
- Other than Finnish- and Swedish-speakers 8 %
- 40 000 students

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Public private partnership ESCO

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The first ESCO city in Finland

- **First ESCO agreement was made in 1994**
- **Nearly 20 ESCO agreements made already**
  - Indoor sports halls
  - Swimming hall
  - Schools
  - Indoor market hall
  - City theatre
  - City concert hall
- **5 different ESCO companies**
- **Latest one is street lightning ESCO**

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ESCO for streetlights

- Streetlights has been changed to more energy efficient ones
    - 13 500 light bulbs
- Also the control system is changed
- Total investment need 10 million €
- Total savings 3200 MWh/yr,
- 400 000 €/yr
- Four phases
    1. 2011 HPS
    2. 2013 LED
    3. 2014 LED
    4. 2015 control system

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Process of the PPP - Energy savings project
Impivaara ice hockey and football hall, Turku

Municipal challenges

1. Limited resources (finance and manpower recourses)
2. Need to retrofit and refurbish (modernization due to back-log of maintenance)
3. Need to reduce energy consumption and cost and improve occupant satisfaction and building performance
4. Environmental ambitions

ESCO process Turku

Facility and energy audit	Public procurement	Project implementation	Measurements and verification	Operation
• Agreed targets • Target energy savings.	• **Negotiated procedure** • Energy saving target of 1280 MWh/a	• Delivery of ECM • (Financing)	• Verification of outcomes • Correction of problems • **Guaranteed performance**	• Continuation of project benefits

Case study: Impivaara ice hockey and football hall, Turku

City of Turku needed a partner for retrofitting and refurbishment to assure the quality of the indoor environment, reduce CO2 emission, fulfil regulations and obtain guaranteed energy savings

Case

- Need to reduce energy cost and improve occupant satisfaction and building performance
- Two sports halls,11000 m2, close to each other, an ice hockey hall with two ice rinks and an indoor football hall.

Solution

- Energy savings projects “ESCO” in partnership with an experienced private partner.
- Guaranteed energy savings to pay for the energy measurement improvements.

Technical solution (Energy measures)

- Re-insulation of the hall
- New adjustable LED-lightning
- Heat recovery from ice production and ventilation to heat tap hot water for the showers and heat the incoming air in the nearby football hall.
- New building management system (automation)

Case study: Impivaara ice hockey and football hall, Turku

City of Turku needed a partner for retrofitting and refurbishment to assure a good indoor climate, reduce environmental impact, fulfil regulations and obtain guaranteed energy savings

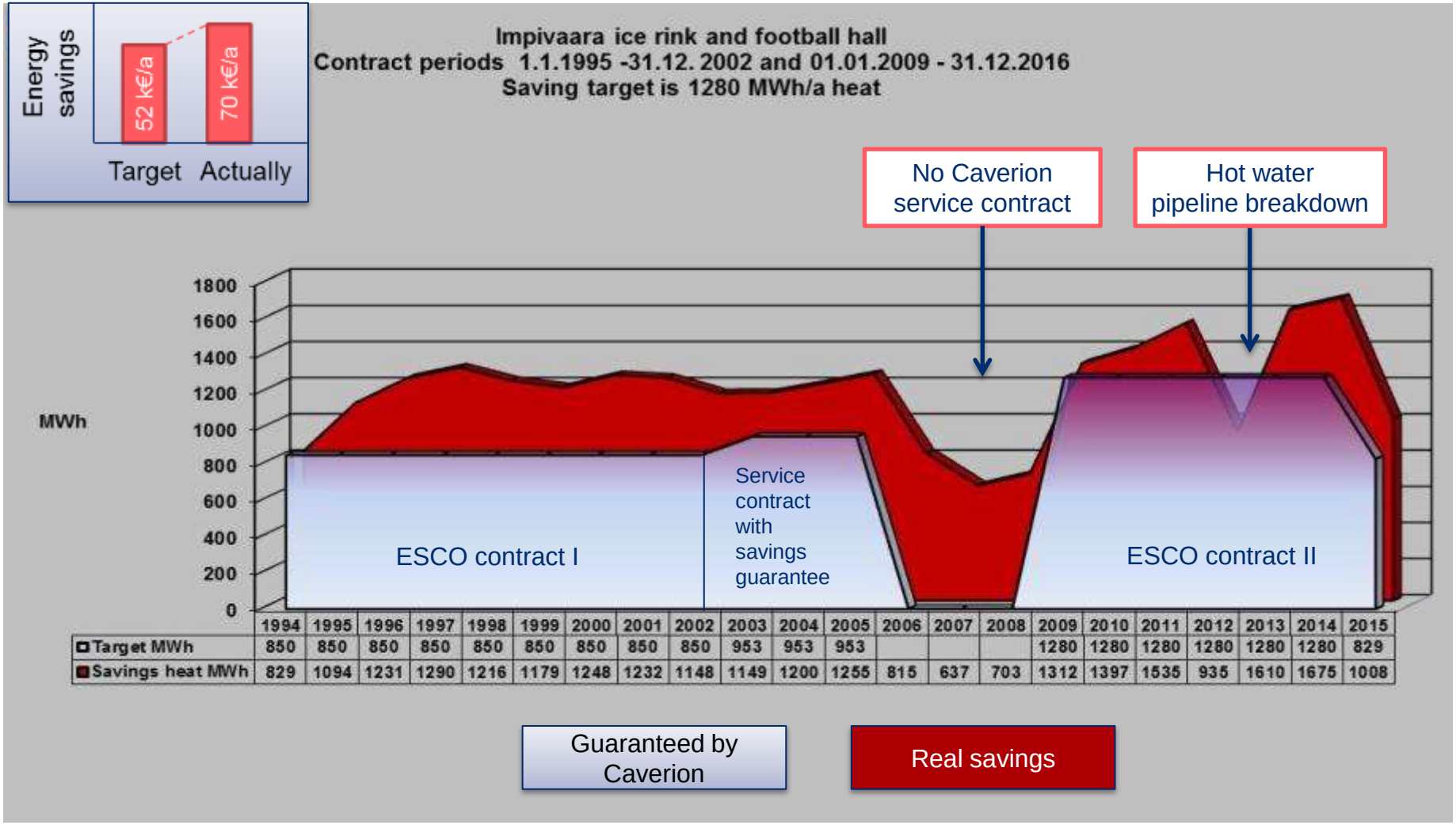
Customer value

- Improved air quality and the temperature of the ice and air is more adjustable than before.
- Caverion responsible for operation and maintenance
- Savings in district heating over 50%, over 70 000 €/year.

Financing

- City of Turku used a leasing agreement with Nordea
- Savings guaranteed for 8 years until 2016
- Total investment 2,2 M€
  - Energy saving investment (500 k€) included air handling units, automation and heat recovery system.
  - Direct investment “maintenance” (1,7 M€) new concrete floor under two ice rink, new cooling pipes inside the concrete, new NH3 compressors, new ice rinks

Case study: Impivaara ice hockey and football hall, Turku



Why Turku likes ESCOs?

- It’s easier to involve the company to the energy efficiency target
  - Company wants to achieve the target, and tries to find the best solutions to do it
  - Company has good knowledge of technology and maintenance
  - Guarantee for the whole contract period
- There is no need to ask the investment money from the city council, included in the maintenance budget
- Subsidies from the state is more than to normal investment
  - ESCO: max. 25%
  - Normal EE investment: max. 20%, normally 10%

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Problems ?

- Usually there are need also for other investments than energy related. ESCO can iclude only energy issues. How to separate the ESCO and other actions?
  - Needs investment decicions from city council and delay is possible.
- How to keep the energy savings level after the contract time?
  - Usually the maintenance contract continues after ESCO time

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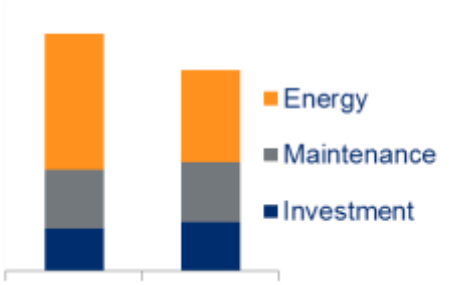
Customer benefits and values of the Energy savings projects

- Guaranteed results. Cost savings are guaranteed with risk of non performance transferred to ESCO.
- Reduced operating and maintenance costs.
- Improved indoor climate and productivity.
- Reduced environmental impact.
- Regulatory compliance to government standards and regulations.
- Ability to redirect capital budget to other more productive purposes.
- Opportunity to upgrade buildings with no initial capital outlay
- Energy savings projects is predictable and proven



ESCO procurement tips 1/2

- Draw up the award criteria with care
- Keep the targets clear in your mind from the start to the end.
- Have an open dialogue with possible tenderers from the start – listen and make notes to avoid misunderstandings
- Publish the questions and answers to the invitations online in examble City website
- Don’t give too strict guidelines, to give the supplier a change to be innovative
- Don’t draw up the final invitation to the tender until the negotiated procedure is almost complete, to meet the targets and the strenghts of the tenderers

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ESCO procurement tips 2/2

- Use the help of a lawer in interpretation of the related laws (don’t trust only the consultant)
- Contract management is important to monitor the savings at least once a year
- Monitoring needs to be clear, for example online metering of heat/oil/gas and electricity, water can be included also
- ESCO projects have a lot of unused potential – they are a good way to improve technical functioning and energy efficiency of buildings
- ESCO projects are a possibility to have new technology as a local pilot and an example for other public organisations and companies

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Advice about PPP and Energy services

- Common goal of the partnership and project is important!
- Involve the municipal council early to avoid delays.
- Assure award criteria that focus on the project goal
  - Don’t buy a black box, you need to understand the cost structure of the measurements as well as the energy savings
- The degree to which energy efficiency could enhance economic and social development is not well understood, and generally considered in national policy decision-making processes only in a qualitative way, if at all.
- Define and agree how to determine and verify Energy and Water Savings
  - EU/National measurement and verification standard?? *E.g. International Performance Measurement and Verification Protocol (IPMVP)*
- Common definitions in EU /National e.g. EPC, ESCO, PPP

Thank you for your attention!