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"INOGATE Technical Secretariat & Integrated Programme in support of the Baku Initiative and the Eastern Partnership energy objectives"

BUILDING PARTNERSHIPS FOR ENERGY SECURITY

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New Technical Secretariat

EU/Swedish practice on EPC and ESCO legislation framework

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What is Energy Performance Contracting (EPC) ?



- EPC is about reducing operative expenses by saving energy in existing buildings
- A typical EPC project is delivered by an Energy Service Company (ESCO) and consists of the following main elements:

- **Turnkey Service**

- The ESCO provides all of the services required in a comprehensive project

- **Comprehensive measures**

- The ESCO tailors a comprehensive set of energy efficiency measures to fit the needs of a particular facility

- **Energy savings Guarantee**

- The ESCO provides a guarantee that the savings produced by the project will be sufficient to cover the cost of project financing for the life of the project

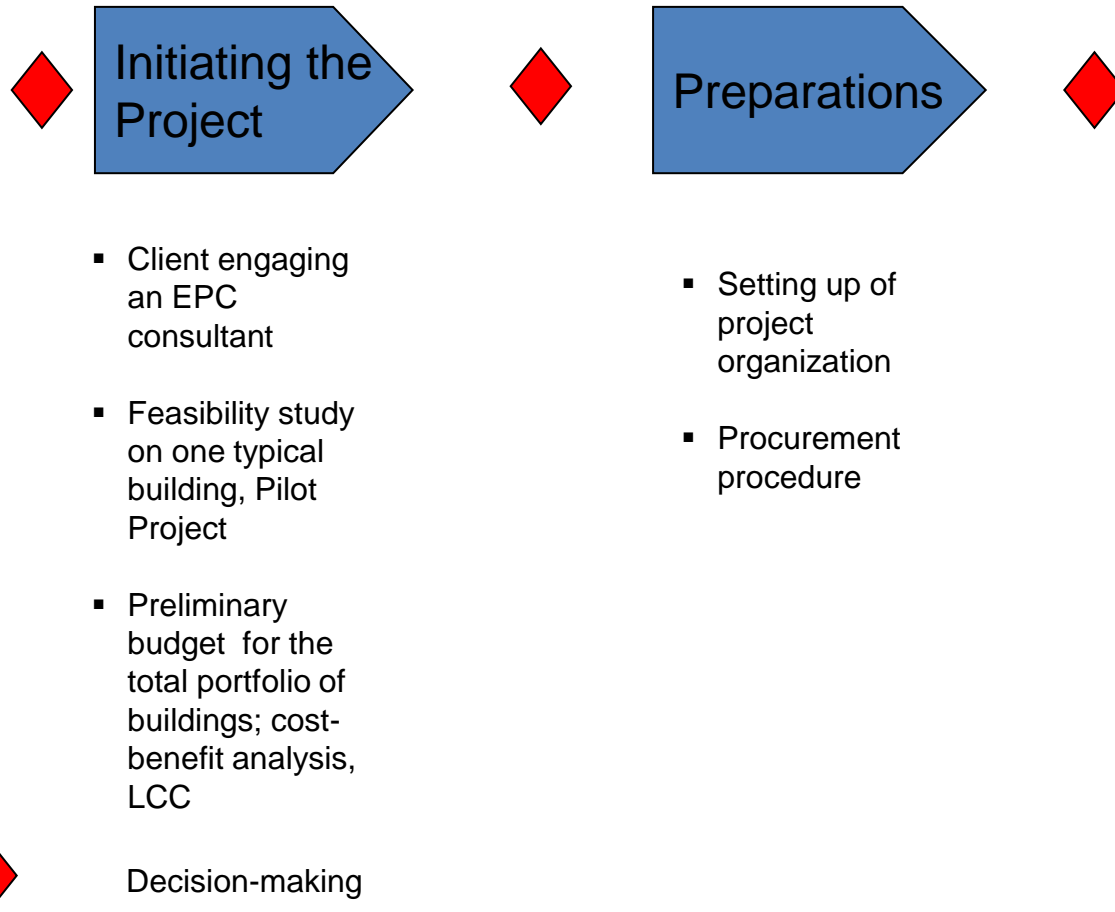
- **Project financing**

- Normally the Client will finance the project. Some ESCO:s can arrange for long-term project financing

Project process



Project process, part one



Project process



Project process, part two

Phase 1 Project Development

- Energy audit
- Proposals energy saving measures
- Verification level use of energy, baseline
- Strategy for control systems
- Strategy for verification
- Strategy for operations & maintenance
- Cost budgeting
- Revision of total project budget

Phase 2 Project Implementation

- Design engineering
- Implementation of energy saving measures
- Documentation
- Inspection
- Training operations & maintenance staff

Phase 3 Project Follow up

- Savings monitoring
- Recalculations related to changes in buildings and use of buildings
- Monthly energy-reports
- Annual reports; verification use of energy
- Bonus/Fine statement
- Guarantee inspection



Decision-making

Energy efficiency measures are normally carried out in the following building systems



- Heating
- Ventilation
- Air Conditioning
- Lighting
- Climate Control and Communication Systems
- Water supply
- Building envelope improvements: insulation

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Results in some EPC projects



Karlstad municipality		Lund municipality	
Number of buildings:	156	Number of buildings:	98
Built up area:	321 910 m ²	Built up area:	303 910 m ²
Contract amount:	7 800 000 EUR	Contract amount:	14 800 000 EUR
Annual savings heating and el :	10 %	Annual savings heating and el:	29 %
	753 000 EUR		1 245 000 EUR
	5 679 000 KWh		14 471 000 KWh
Reduced CO ₂ emission:	2 000 tons	Reduced CO ₂ emission:	4 800 tons
Annual savings water:	15 %	Annual savings water:	11 %
	41 600 EUR		13 000 EUR
	23 013 m ³		11 416 m ³

Laxå municipality		Halmstad municipality	
Number of buildings	10	Number of buildings:	187
Built up area	26 719 m ²	Built up area:	349 773 m ²
Contract amount	2 200 000 EUR	Contract amount	9 000 000 EUR
Annual savings heating and el.	31 %	Annual savings heating and el:	21 %
	120 000 EUR		1 200 000 EUR
	1 380 000 KWh		12 734 000 KWh
Reduced CO ₂ emission:	156 tons	Reduced CO ₂ emission:	5 400 tons
		Annual savings water:	11 %
			17 200 EUR
			16 195 m ³

Payback period of an EPC Project



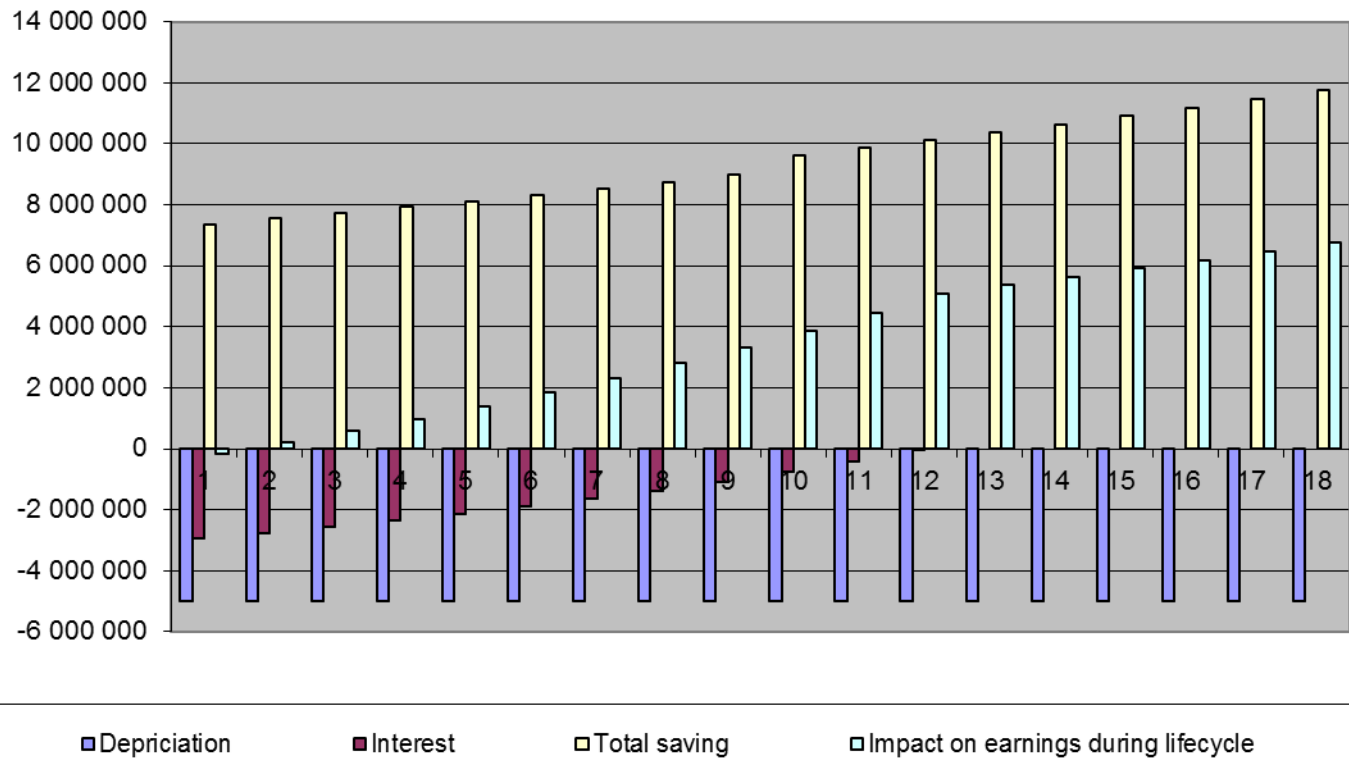
Example

- Investment; the total cost of an EPC Project: 900 000 EUR
- Annual energy saving (avoided KWh. X energy price EUR/KWh): 90 000 EUR
- Payback period: Ten Years

Cash-flow calculation of an EPC Project



EXAMPLE OF CASHFLOW IN AN EPC PROJECT



How to verify annual energy savings in an EPC Project



Example: first year of follow up

▪ Used energy before Project, as per energy meters (baseline):	30 770 MWh
▪ Actual used energy during the first year, as per energy meters:	24 670 MWh
▪ Adjustments due to changes in use of buildings and in climate:	370 MWh
▪ Adjusted used energy for the first year of follow up:	25 040 MWh
▪ Energy saving; avoided MWh: $30\,770 - 25\,040 =$	5 730 MWh
▪ Energy price: 105 EUR/MWh	
▪ Value of the avoided MWh during the first year of follow up:	601 650 EUR

Referens: Example of a transparent calculation methodology to verify guaranteed savings

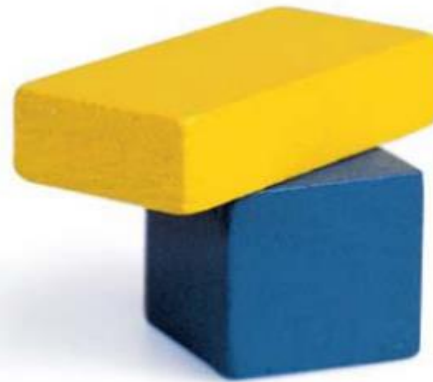


EPC Procurement and contracting model Agreements



Procurement of EPC contracts in the Swedish public sector is done by following the Swedish Public Procurement Act

Swedish Public Procurement Act



Either of the following three procurement procedures are normally followed:

- Open procedure
- Selective procedure
- Negotiated procedure

EPC Procurement and contracting model Agreements, cont.



General Conditions of Contracts normally used in EPC

Contracts in Sweden

- General Conditions of Contracts for design and construct contracts for building, civil engineering and installation works
- General Conditions of Contract for Work in Property Management and Facility Management

Set of agreements in EPC Contracts normally used in Sweden,
“Guaranteed savings” model

- Principle Agreement
- Agreement regarding Phase 1, Project Development
- Agreement regarding Phase 2, Project Implementation
- Agreement regarding Phase 3, Project Follow up

Laws, regulations, guidelines in EU to facilitate EPC/ESCO



European legislation

- Directive on End-use Efficiency & Energy Services (2006/32/EC)
- Energy Performance of Buildings Directive (2010/31/EU)
- European standard EN 15900:2010
- Energy Efficiency Directive (2012/27/EU)

EU programmes and other measures

- Energy Performance Contracting Campaign
- Covenant Mayors
- Intelligent Energy Europe
 - European Energy Service Initiative
 - European Energy Service Initiative towards the EU 2020 energy saving targets
 - Transparency project

Financing

- Multi-annual Financial Framework
- Project Development Assistance
- European Energy Efficiency Fund



Laws, regulations, guidelines in Sweden to facilitate EPC/ESCO



- Energy certificates for buildings
- Subsidy scheme for public buildings, KLIMP
- Subsidy scheme for public buildings, OffRot
- Market instruments:
 - CO₂ taxes
 - Green certificates
 - Electricity tax for energy incentive companies
- VA PFE; tax relief on electricity tax
- Procurement guidelines for EPC
- Procurement models
- The National Energy Efficiency Action Plan of Sweden (Government of Sweden 2011)

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