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German financial incentives and innovative financing methods

Belgrad, October 6th, 2006

Overview

- Financial incentives
 - Subsidies
 - Low-interest loans
 - Tax incentives
- Innovative financing methods
 - Performance Contracting
 - Energy Supply Contracting



Financial incentives

General strategies of promotion

Promotion by loans: low-interest loans

Promotion by subsidies: not repayable national investment subsidies

Tax reductions: depreciation / tax reduction

Promotion by Loans: Offers of KfW Bank

- Energy efficient renovation for existing buildings:
 - 1,6 billion € loan commitment (2005)
 - low-interest loans (partly with repayment subsidies)
 - Also energy efficient renovation of Federal Buildings, schools and nursery schools
- Ecological construction of new buildings:
 - 0,4 billion € loan commitment (2005)
- Promotion of Renewable Energies (for trade, municipalities, associations)
 - Promotion 2005 total: 4,2 billion €
 - Program Promotion of Renewable Energies: 336 million EUR loan commitment in 2005
- effects:
 - investment impulse triggered in the building industry and in executing crafts
 - impulse for innovation in the field of technical systems
 - energy efficiency measures are at the brink to economic efficiency

Promotion by subsidies: market incentive program

- Subsidies for the installation and extension of solar thermal plants.
 - Subsidy of 84 EUR/m², 108 EUR/m² per installed m² collector area
- Subsidies for biomass plants (wood-pellets, wood-chips...)
 - Subsidy 40-48 Euro per kW installed heat power
- Heat from renewable energies in schools
 - possible combination: subsidies for solar thermal plants or automatic biomass plant plus an additional subsidy

Promotion by tax deductions.

- Tax deductions (e.g.)
 - From 2006 on: 20% of the costs for services for renovation, conservation and modernisation shall be deductible from income tax (annually up to 600 EUR)
 - Example France: for renovation of private flats generally a reduced VAT of 5,5 % applies instead of 19,6%.
 - Reduced electricity and petroleum tax for contractors (ESCO's)
- Tax exemption (e.g.)
 - CHP-plants $< 2 \text{ MW}_{\text{th}}$ are exempted from the electricity tax, therefore better conditions are possible

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Contracting Models

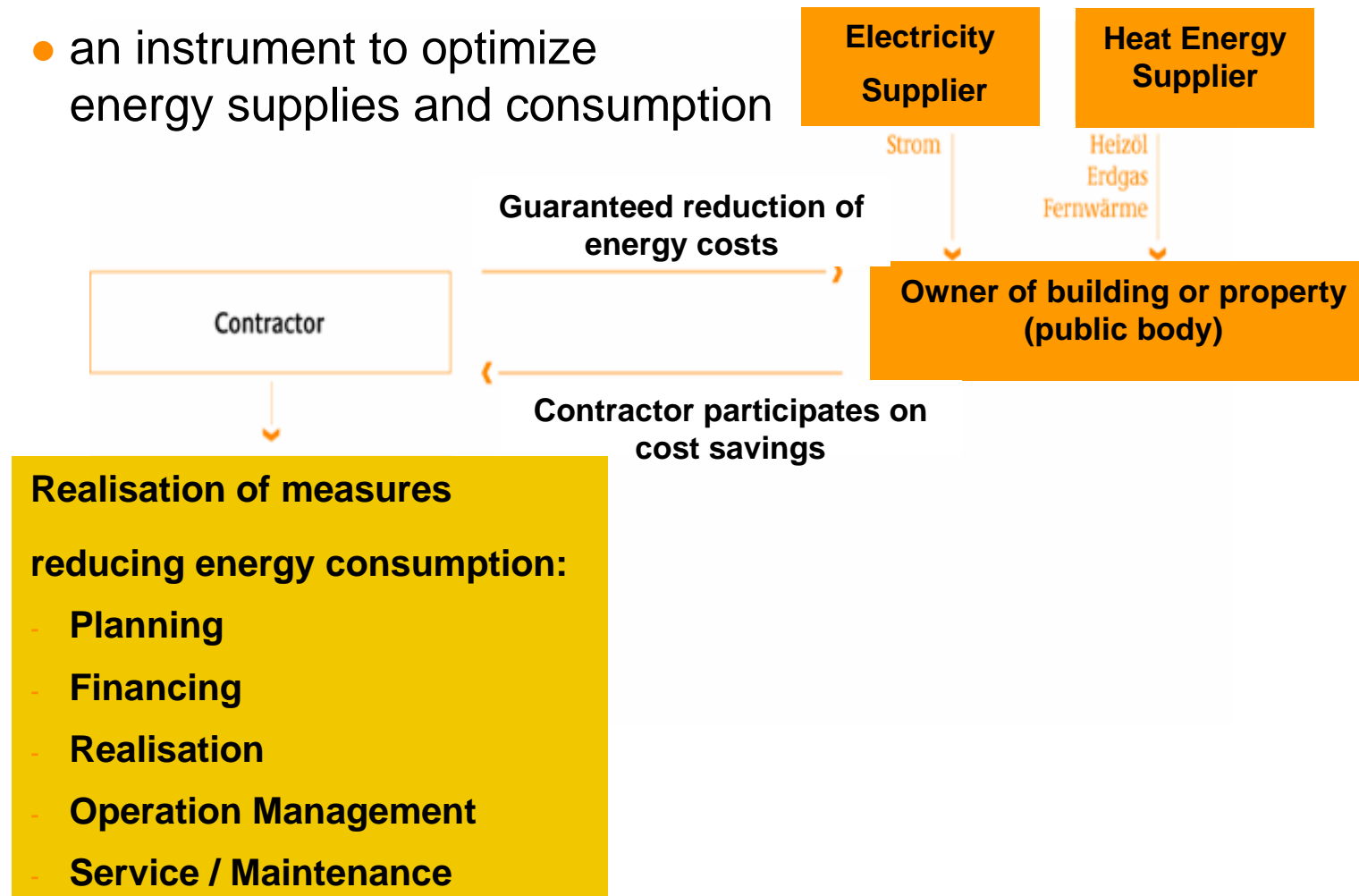


Prospects of Contracting.

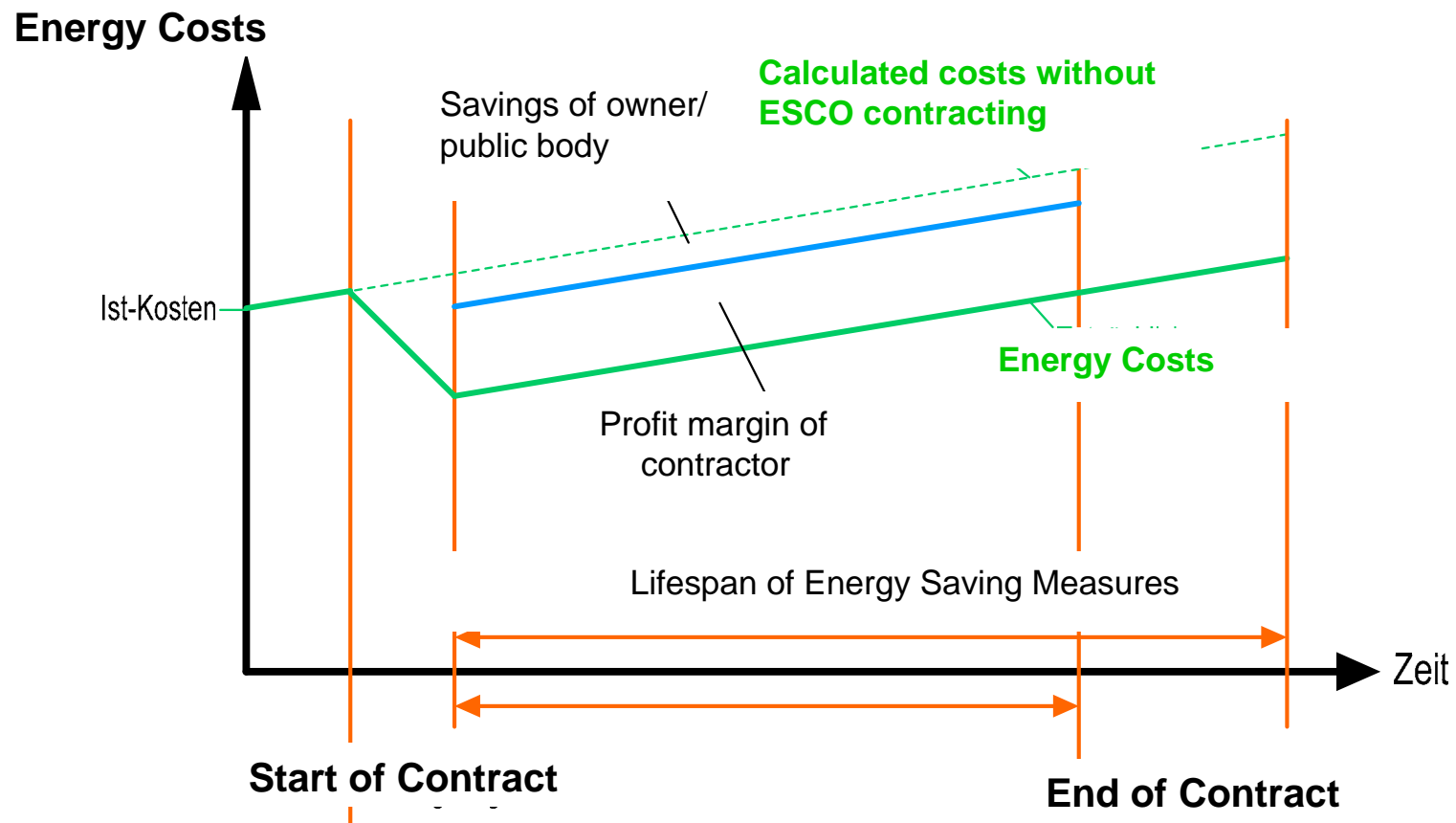
- Budget relief, no use of own funds
- Organizational relief
- Outsourcing of risks (investment, technology, conservation success)
- Use of the contractor's specialization and expertise
- Initiation of competition (ideas, know-how, financing)
- Preservation of value of buildings
- Energy conservation, reduction of CO₂ emissions

Performance Contracting.

- an instrument to optimize energy supplies and consumption



Model of Financing.



Guaranteed Services by the Contractor.

- Reduction of energy costs
- Participation of the owner in a certain percentage (agreed before)
- Investment in energy conservation measures (defined beforehand in extent and nature)
- Introduction and/or optimization of energy control system
- Maintenance of the systems throughout the contract period
- Observance of specified comfort standards
- Annual documentation and invoicing



All aspects are guaranteed in the contract

Typical Optimization Measures.

- Introduction or optimization of building master-control systems and continuous energy control through long-distance monitoring
- Hydraulic balance of distribution systems (heating, ventilation systems)
- Use of speed-controlled circulation pumps and ventilators
- Heat recovery in the ventilation systems
- Optimized lighting technology
- Cold and steam: optimized production, storage, distribution
- Installation of Combined Heat and Power Production (CHP)

- But: Thermal protection measures of the building surface are normally not carried out since they payback period is longer than the contract duration

Energy Supply Contracting.

- Main idea: transfer the economic advantage of efficient energy production to a private service company
- Contractor:
 - Finances, plans, installs and runs a facility for energy production,
 - Delivers und sells useful energy (heat, cool, pressure, electricity etc.),
 - Annual documentation of energy consumption
- Suitable for complete modernization of energy supply or new buildings
- Specific know-how of contractor enables innovative energy supply concepts (use of biomass, CHP)

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Project of the German
Energy Agency:
“Contracting for
Federal Buildings”

dena
Deutsche Energie-Agentur



Background and Goals.

- **Voluntary commitment by the Federal Government**

- October 2000: decision by Federal Government as part of National Climate Protection Program
- CO₂ emissions by federally owned buildings are to be reduced by 25% by 2005 and by 30% by 2010, relative to 1990 level

- **National Strategy for Sustainable Development**

- Decision by the Federal Government of April 17, 2002
- Demonstration project "Contracting for Federal Buildings"
- Demonstration of viability of contracting
- Budget-neutral modernisation of federal buildings

- **Coalition agreement by the Federal Government**

- Nov. 2005: "Application of Energy-Contracting in federal buildings should be increased"

Demonstration Project.

- **Project realization by the German Energy-Agency (dena)**
 - Project guidance and coordination
 - Technical advice for federal building administrations
 - dena does not appear as contractor itself
- **Focus of activities**
 - Development of tender instruments (model contracts, model tender texts)
 - Clarification of budget statutes regarding handling of contracting (payments estimates, commitment authorizations)
 - Selection and offering of suitable federal buildings for contracting projects

Completed Energysaving-Contracting Tenders.

Project	Fede- ral state	Reference energy costs	Contractual guaranteed results					
			Guaranteed investments	Guaranteed reduction of energy costs	Immediate budget relief	contract duration	CO ₂ -reduction	
Federal Police Headquarters Center, Fuldata	HE	260.000 €/a	272.000 €	77.000 €/a 30%	15.000 €/a	10 a	475 t/a 20%	
Customs Office, Cologne	NW	409.000 €/a	336.000 €	128.000 €/a 31%	36.000 €/a	7 a	680 t/a 22%	
Federal research institute for nutrition and food, Kiel	SH	548.000 €/a	720.000 €	228.000 €/a 42%	77.000 €/a	10 a	1.095 t/a 38%	
Federal Institution for hydraulic engineering, Karlsruhe	BW	338.000 €/a	320.000 €	77.000 €/a 23%	2.000 €/a	10 a	350 t/a 20%	
Pool Hamburg	HH	692.000 €/a	1.282.000 €	256.000 €/a 37%	64.000 €/a	10 a	668 t/a 18%	
Federal Employment Office, Frankfurt	HE	235.000 €/a	174.000 €	35.000 €/a 15%	0 €/a	10 a	175 t/a 16%	
German library, Frankfurt	HE	481.000 €/a	662.000 €	120.000 €/a 25%	19.000 €/a	10 a	958 t/a 27%	
Pool German Federal Armed Forces, Hamburg	HH	1.044.000 €/a	1.092.000 €	149.000 €/a 14%	0 €/a	13,5 a	360 t/a 7%	
Kulturforum (Museums), Berlin	BE	2.467.000 €/a	4.470.000 €	751.000 €/a 30%	120.000 €/a	10 a	6.005 t/a 39%	
German Patent and Trademark Office	BY	705.000 €/a	434.000 €	129.000 €/a 18%	42.000 €/a	10 a	742 t/a 18%	
Pool Rheinland-Pfalz (Armed Forces + Federal Police)	RP	435.000 €/a	559.000 €	186.000 €/a 43%	55.000 €/a	10 a	732 t/a 26%	
Federal Institute for Risk Assessment	BE	147.000 €/a	130.000 €	37.000 €/a 25%	0 €/a	10 a	397 t/a 37%	
Sum (12 contracts, 21 real estates)		7.762.000 €/a	10.452.000 €	2.174.000 €/a 28%	429.000 €/a		12.636 t/a 27%	

Results and Prospects.

- Results after the already completed tenders (21 federal real estates):
 - Guaranteed savings of energy costs: a total of 2,17 Mio. €/ year net (28%)
 - Relief of federal budget: a total of 429.000 €/ year net
 - Guaranteed investments: about 10 Mio. € net
 - Reduction of CO₂-Emissions: a total of 12,600 t / year (27%)
(aprox. CO₂-Emissions of 1,000 One-Family-Houses)
- Use of combined heat and power units (CHP) in many of the projects
- The full potential for Performance Contracting in federal public buildings is yet only barely tapped



Example ESC:
Federal Police Headquarter, Fuldataal.

Situation.



- Use:
 - administration
 - housing
 - workshops
 - aircraft hangars
- Number of buildings: 25
- 52.000 m² building area
- Energy needs for 2002:
 - approx. 5.000 MWh/a natural gas
 - approx. 1.000 MWh/a electricity
- Energy costs: 260.000 €/a
- district heating

Results of Tender.

● Energy Services Performance Contract Conditions

- Contract signed: July 2004 with Siemens Building Technologies
- Contract duration: 10 years
- Guaranteed energy cost savings: 77.000,- €/ year (30%)
- Benefit of cost savings by the owner: 15.000,- €/ year (20%)
- Investment of the Contractor: 270.000 €
- Reduction of CO₂ emissions of 535 t / year (-27%)

● Measures

- Installation of a cogeneration plant (110 kW electric, heat conducted)
- Optimization of the control and operation of the heat plant
- Hydraulic optimization of the short-distance heat-transport lines
- Replacement of lighting fixtures and methods in various buildings
- Optimization of the ventilation units in the helicopter hangars
- Optimization of existing building master-control systems

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Example:
Energy Supply
Contracting



Energy Supply Contracting: School for Sports, Federal Armed Force in Warendorf



- Use:
 - school for sports
 - housing
 - administration
- number of buildings: 36
- 37.000 m² building area
- need of heat: 10.000 MWh/a
- heat power: 3.690 kW
- call for tender by the military administration with not fixed technical solution

Results: School for Sports Federal Armed Force.

- Completion of contract: 1st May 2004
- Contractor: Energieagentur Lippe GmbH (EAL)
- Contract duration: 20 years
- Construction of wooden fired heat supply 2 MW_{th}
- Investment of 615.000,- Euros
- Alteration former coal store into wood chipping store
- Substitution of about 850.000 liter / year heating oil
- Delivery of wood mainly by local forestry
- Reduction of CO₂-Emissionen of about 3.000 tons / year
- Initial utilization: February 2005 (9 month after contract signature)

Innovative Technologies: wood chips firing

- Energy Supply Contracting allows innovative technologies:
- Know-how by Contractor
- No maintenance or failure risk for the building owner



Further Information.

- www.zukunft-haus.info
- www.contractingoffensive.de

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Efficiency decides.