

# M8

## New Management Concepts in the Energy Market



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# 1. Energy Service Models

## 1.1. The Question:

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Can we simultaneously improve energy efficiency and economy of buildings?

- ➔ without (or only little) own investment capital ?
- ➔ with guaranteed total cost or guaranteed savings ?
- ➔ with innovative technologies ?
- ➔ with individually compiled services

# 1. Energy Service Models

## 1.2. Energy Management Process

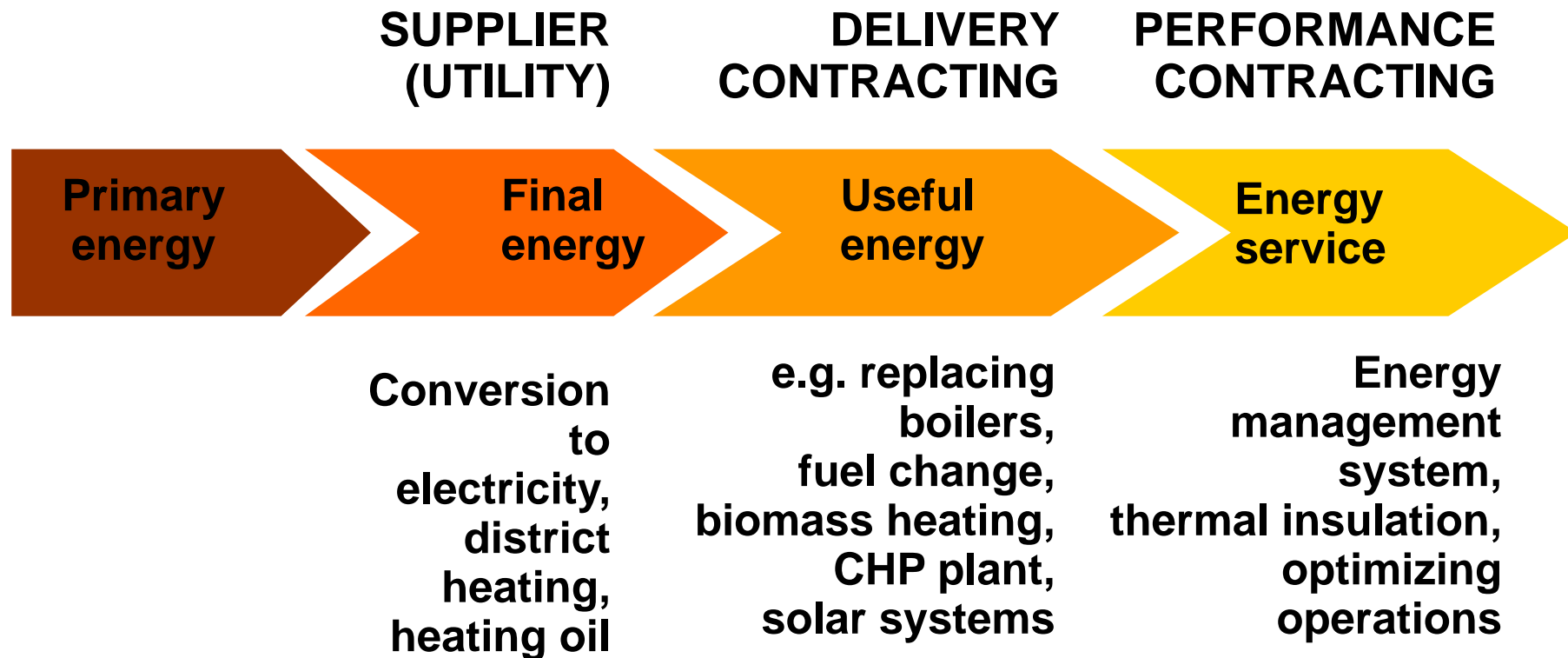
### Energy Services / Third Party Financing as an Instrument in Municipal Energy Policy

1. Why energy services?
2. What exactly is an energy service?
3. Some Good Practice:
  - Small Community Building Pool, Kichbach, Austria
  - Refurbishment of Street Lighting: City of Laa, Austria
  - > 300 public buildings in Berlin: „Energy Saving Partnership“ (ESP), Berlin, Germany
  - Success criteria and recommendations

Source: Boris Papousek, [www.grazer-ea.at](http://www.grazer-ea.at)

# 1. Energy Service Models

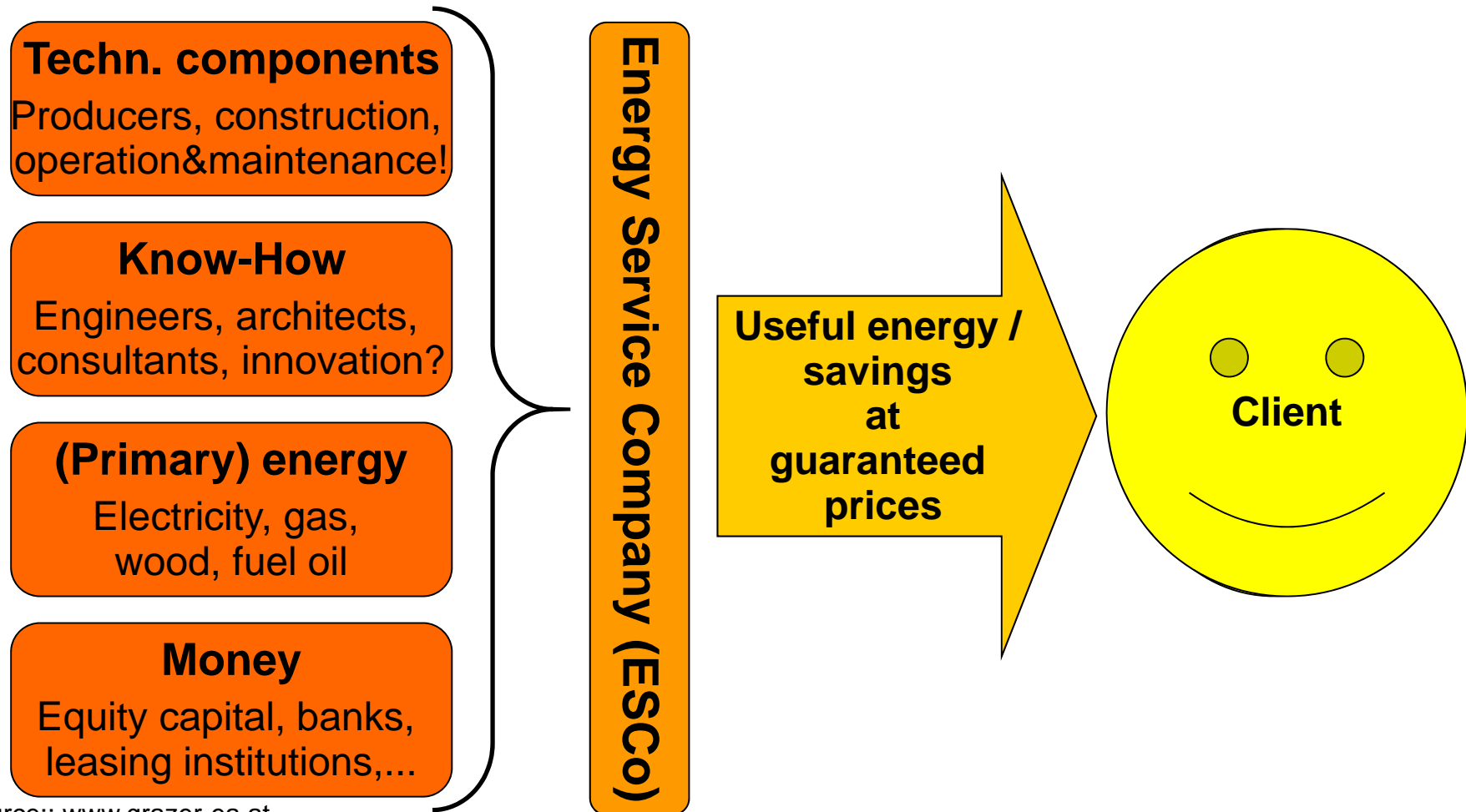
## 1.2. Energy Management Process



Source: Boris Papousek, [www.grazer-ea.at](http://www.grazer-ea.at)

# 1. Energy Service Models

## 1.3. What is Energy Service?



Source:: [www.grazer-ea.at](http://www.grazer-ea.at)

# 1. Energy Service Models

## 1.4. Types of Energy Service Contracts

### Delivery Contracting

- Energy service company (ESCO) designs, constructs, operates and finances the energy supply facilities
- ESCo is responsible for purchasing of fuels (gas, ...)
- ESCo delivers useful energy (heat, electricity, compressed air) with guaranteed prices (all inclusive)
- Payments depend on actual consumption

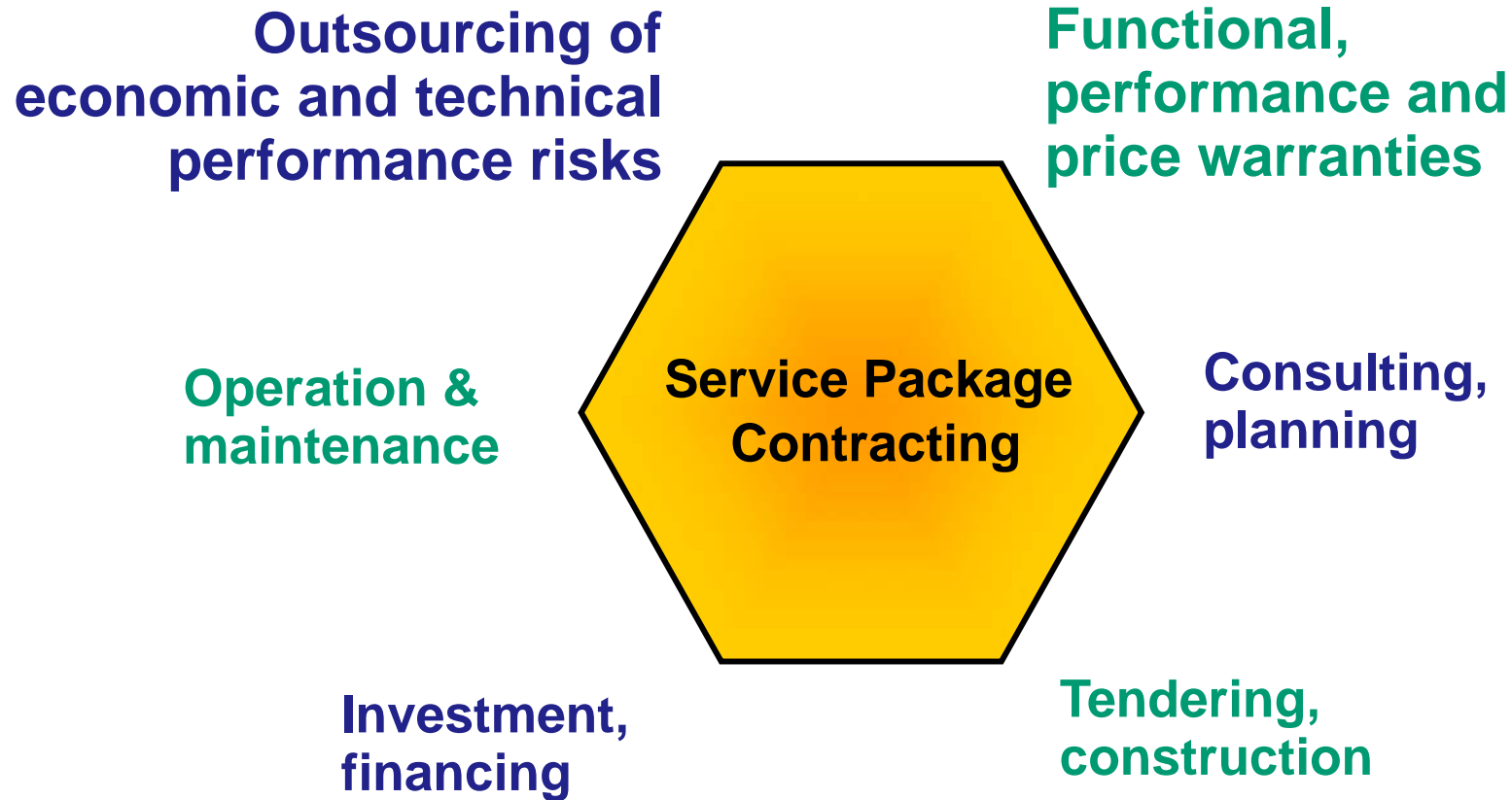
### Energy Performance Contracting

- ESCo designs, constructs, operates and finances energy saving measures in the building
- ESCo delivers energy services (tempered rooms, illuminated work areas, air exchange etc.) at fixed prices (Contracting - rate)
- ESCO guarantees max. energy consumption/cost and is financially responsible for deviations (bonus-malus)

Source:: [www.grazer-ea.at](http://www.grazer-ea.at)

# 1. Energy Service Models

## 1.5. Contracting - a Customized Service Package



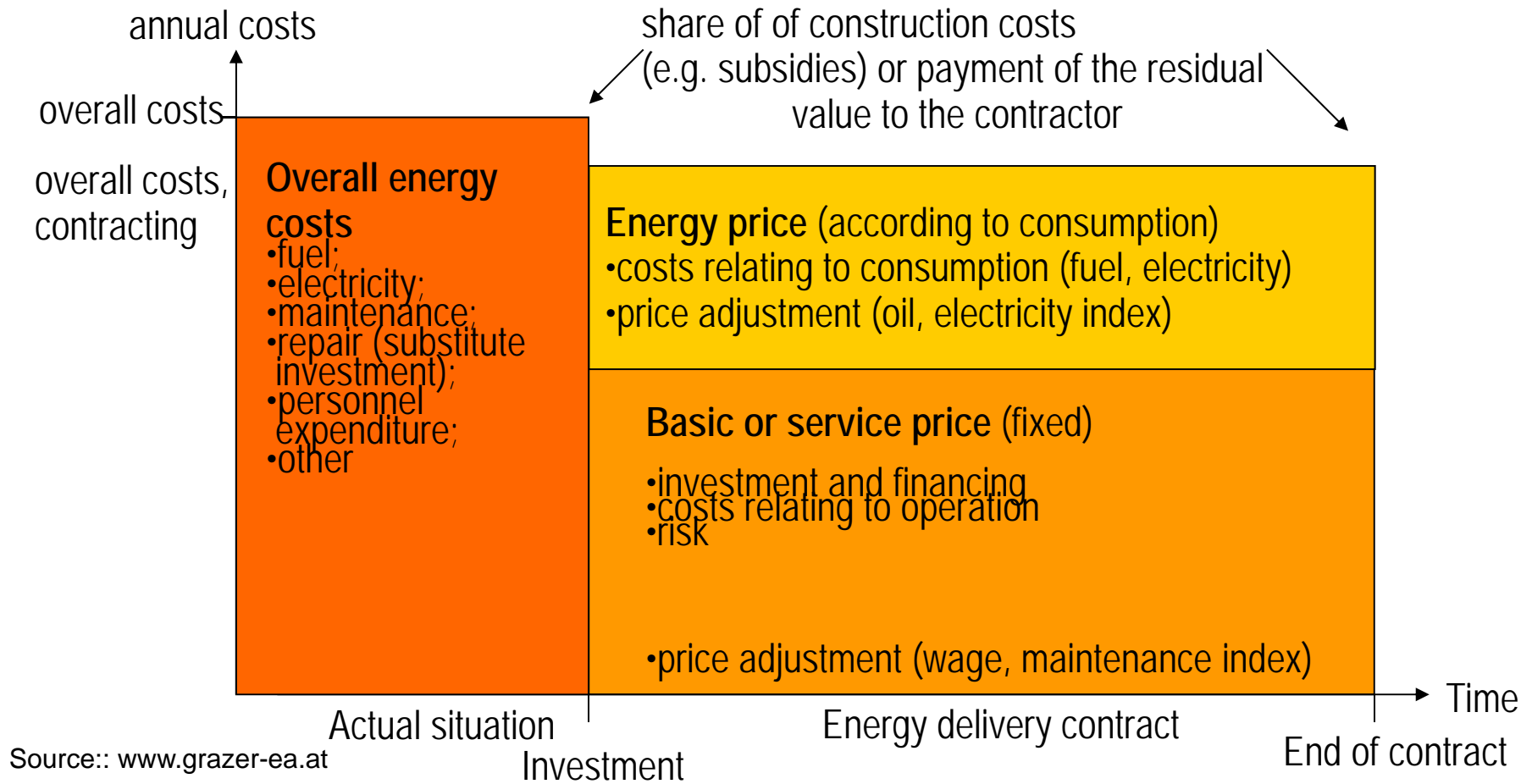
Source:: [www.grazer-ea.at](http://www.grazer-ea.at)



# 1. Energy Service Models

## 1.6. Business Models (1/2)

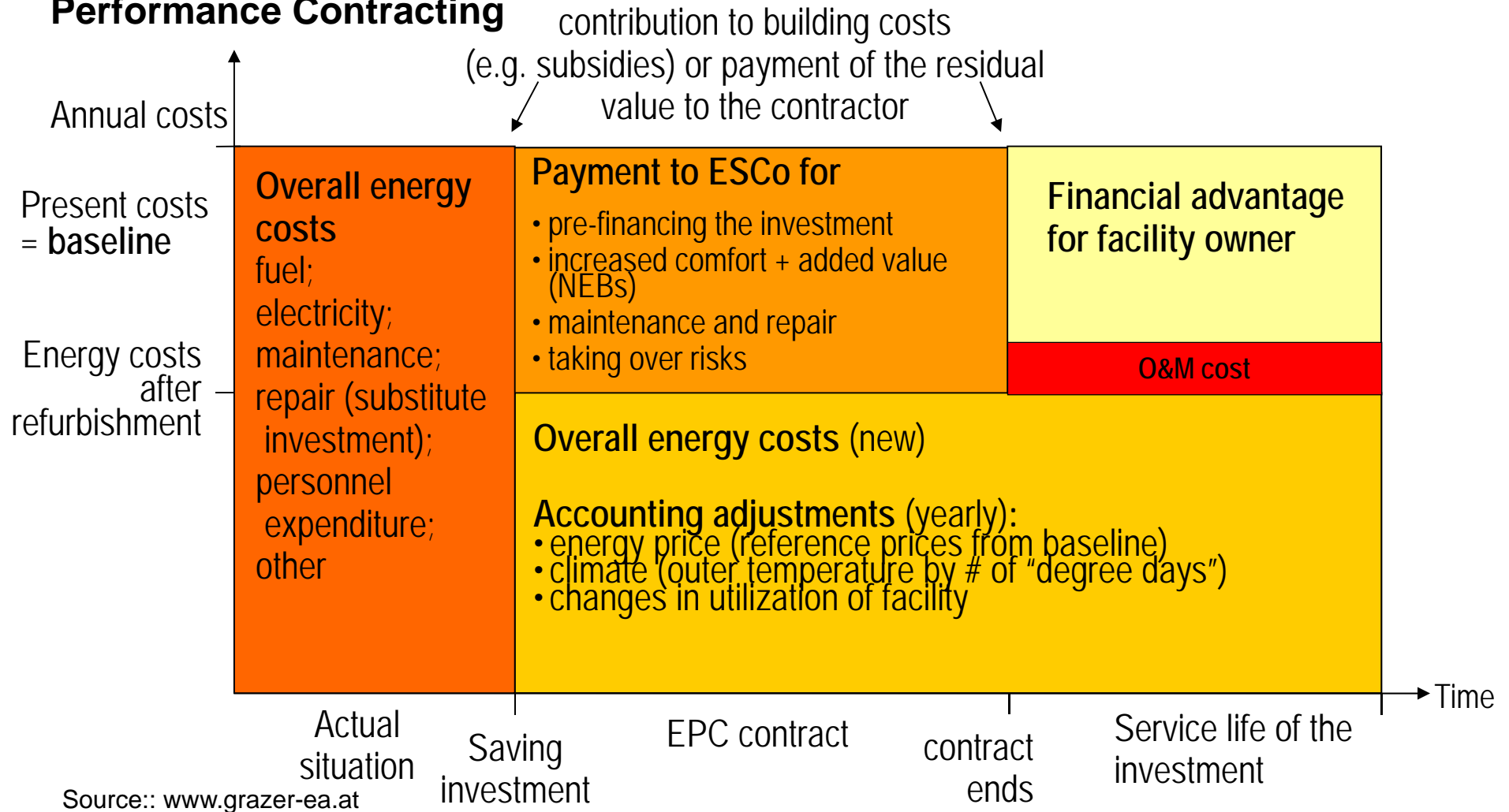
### Delivery Contracting



# 1. Energy Service Models

## 1.6. Business Models (2/2)

### Performance Contracting



# 1. Energy Service Models

## 1.7. Advantages of Contracting Models (Client Perspective)

- ✓ Saving investment costs through third-party financing and (part-) repayment from savings;
- ✓ Eliminating deficiencies and increasing the value and comfort of the building;
- ✓ Shifting technical and economical risks to the ESCo;
- ✓ Warranted savings and energy prices;
- ✓ Focusing on the key business;
- ✓ One contact person for all matters (one face to the customer);
- ✓ Long-term increase in the revenue from the property

The objective is to create a win-win-win situation for all parties involved: financial advantage for supplier and consumer, while the environment benefits too.

Source:: [www.grazer-ea.at](http://www.grazer-ea.at)

## 2. Examples of Energy Service Models

### 2.1. Refurbishment of Street Lighting (1/3)

- Total investment: 450,000 € (excl. VAT)
- The refurbishment measures included:
  - ✓ Some 167 light points in the main streets, including masts, digging, wiring and switching units.
  - ✓ Auxiliary services like removing of old installations, assembling of new street lights, protective earthing,
  - ✓ Some 57 lamp posts are equipped with illuminated advertisement boards (size A0) to generate an income to the city



Source:: [www.grazer-ea.at](http://www.grazer-ea.at)

## 2. Examples of Energy Service Models

### 2.1. Refurbishment of Street Lighting (2/3)

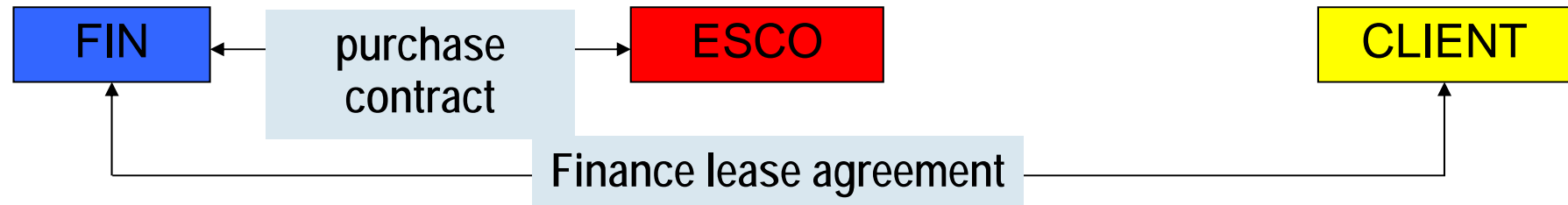
- Financer (FIN) and customer (CUST) have concluded a financing lease agreement.  
The investment is repaid by the city over a contract period of 15 years.
- The new street lighting is planned and built by an ESCO by order of FIN (purchase contract).  
There is no direct contract relationship between ESCO and CLIENT.
- By renting out the advertising boards on the lamp posts, the city generates an additional income.
- Also, a part of the investment is VAT deductible by a contractual differentiation between “sovereign community tasks” and “income from rent and lease”. This accrues to about 5 % (21,000 €) of the investment.

Source:: [www.grazer-ea.at](http://www.grazer-ea.at)

## 2. Examples of Energy Service Models

### 2.1. Refurbishment of Street Lighting (3/3)

#### Contracts:



#### Cash flows:



#### Innovative aspect:

- ✓ contractual differentiation between *sovereign community tasks* and *income* from rent and lease ⇒ Cut down of the investment and additional income from renting for the community.

Source:: [www.grazer-ea.at](http://www.grazer-ea.at)

## 2. Examples of Energy Service Models

### 2.2. Savings Potential in Public Buildings – „Energy Saving Partnership“ Berlin

	<b>Pool 9 F'hain</b>	<b>Pool 10 TFH</b>	<b>Pool 11 Steglitz/Z'dorf</b>	<b>Pool 12 BBB</b>	<b>Contracts in total</b>
<b>Number of properties</b>	30	5	41	11	<b>309</b>
<b>Cost baseline (Euro)</b>	1 090 529 €	928 165 €	1 285 102 €	4 871 293 €	<b>24 523 174 €</b>
<b>ESCo</b>	MVV Energie / WFM	SFW	SFW	Landis & Staefa	
<b>Contract term</b>	10 years	10 years	12 years	10 years	
<b>Initial saving invest. (Euro)</b>	939 243 €	552 195 €	920 325 €	7 925 683 €	<b>23 210 183 €</b>
<b>Guaranteed savings (%)</b>	19,67 %	22,50 %	22,00 %	33,54 %	<b>22,90 %</b>
<b>Guaranteed savings client (%)</b>	3,46 %	4,50 %	2,42 %	6,71 %	
<b>Guaranteed savings client (Euro)</b>	37 753 €	41 767 €	31 099 €	326 766 €	<b>1 652 173 €</b>

Source: Berlin Energy Agency 2002

Source:: [www.grazer-ea.at](http://www.grazer-ea.at)

## 2. Examples of Energy Service Models

### 2.3. Energy services – opportunities, risks and success criteria

<b>Decision criteria:</b>	<b>In house</b>	<b>Energy Service</b>
<b>Investment costs</b>	100 %	0 – 100 %
<b>Economic and technical risks</b>	Owner	Contractor
<b>Optimal maintenance of facility</b>	only with a high owner commitment	Contractor's own interest
<b>Performance warranties (e.g. maximum consumption, efficiency)</b>	No	Yes
<b>Functional guarantees</b>	only warranty period	over total contract period
<b>Cost limits (eg investment, prices)</b>	No	Yes
<b>Long-term contractual obligation</b>	No	Yes
<b>Project co-ordination / know-how</b>	building owner + engineer	Consultant + ESCO
<b>Service package / outsourcing</b>	No	Yes
<b>Size of the building / facility</b>	any	Floorspace > 2,000 m <sup>2</sup> Energy costs > 20,000 €/a
Source:: <a href="http://www.grazer-ea.at">www.grazer-ea.at</a> <b>Life cycle costs</b>	usually higher	usually lower



## 2. Examples of Energy Service Models

### 2.4. Conclusions and Recommendations

1. Energy services – delivered by ESCOs - are a well proven instrument to successfully implement energy conservation measures.  
=> We recommend to publicly call for tenders and compare offers to „in house“ solutions.
  2. Project development and implementation requires a lot of effort and experience (functional tendering, awarding of contract, model contracts, ...).  
=> To support the process, we recommend co-operation with an experienced consultant (eg energy agencies)
  3. The European Community supports the energy service approach, eg:
    - ⇒ The energy end-use efficiency and energy service directive will (hopefully) come,
    - ⇒ [www. Eurocontract.net](http://www.eurocontract.net) supports market implementation in 9 European member states.
- ⇒ **Could your buildings profit from Energy Services?**

Source:: [www.grazer-ea.at](http://www.grazer-ea.at)

# 3. Energy Centers as Partners

## 3.1. Actors

### Local & regional Energy Agencies

- Best knowledge about local needs and conditions
- Influence on local energy policy & decision-making
- Better opportunities to implement change at local level

=> 380 Energy Agencies in Europe.

Source:: [www.grazer-ea.at](http://www.grazer-ea.at)



# 3. Energy Centers as Partners

## 3.2. Tasks of Energy Centers

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- Raise competence & increase knowledge
- Build networks and contacts
- “Learn from each other” – share experiences
- Think Global, Act Local
- Prioritised areas:
  - Energy efficiency
  - Renewable energies (sustainable use of energy)
  - Transport and mobility
- Key Themes
  - Buildings
  - Education

# The UP-RES Consortium

Contact institutions for this module: **Aalto University**



- **Finland : Aalto University School of science and technology**  
[www.aalto.fi/en/school/technology/](http://www.aalto.fi/en/school/technology/)



- **Spain : SaAS Sabaté associats Arquitectura i Sostenibilitat**  
[www.saas.cat](http://www.saas.cat)



- **United Kingdom: BRE Building Research Establishment Ltd.**  
[www.bre.co.uk](http://www.bre.co.uk)



- **Germany :**  
**AGFW - German Association for Heating, Cooling, CHP**  
[www.agfw.de](http://www.agfw.de)



**UA - Universität Augsburg** [www.uni-augsburg.de/en](http://www.uni-augsburg.de/en)



**TUM - Technische Universität München** <http://portal.mytum.de>



- **Hungary : UD University Debrecen**  
[www.unideb.hu/portal/en](http://www.unideb.hu/portal/en)