



Task XVI  
"Competitive  
Energy Services"  
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RWE Energiedienstleistungen



# An Introduction to Energy and Demand Response Services

Task XVI Platform Meeting,  
September 14<sup>th</sup> - 16<sup>th</sup>, Madrid

Jan W. Bleyl-Androschin

# Overview

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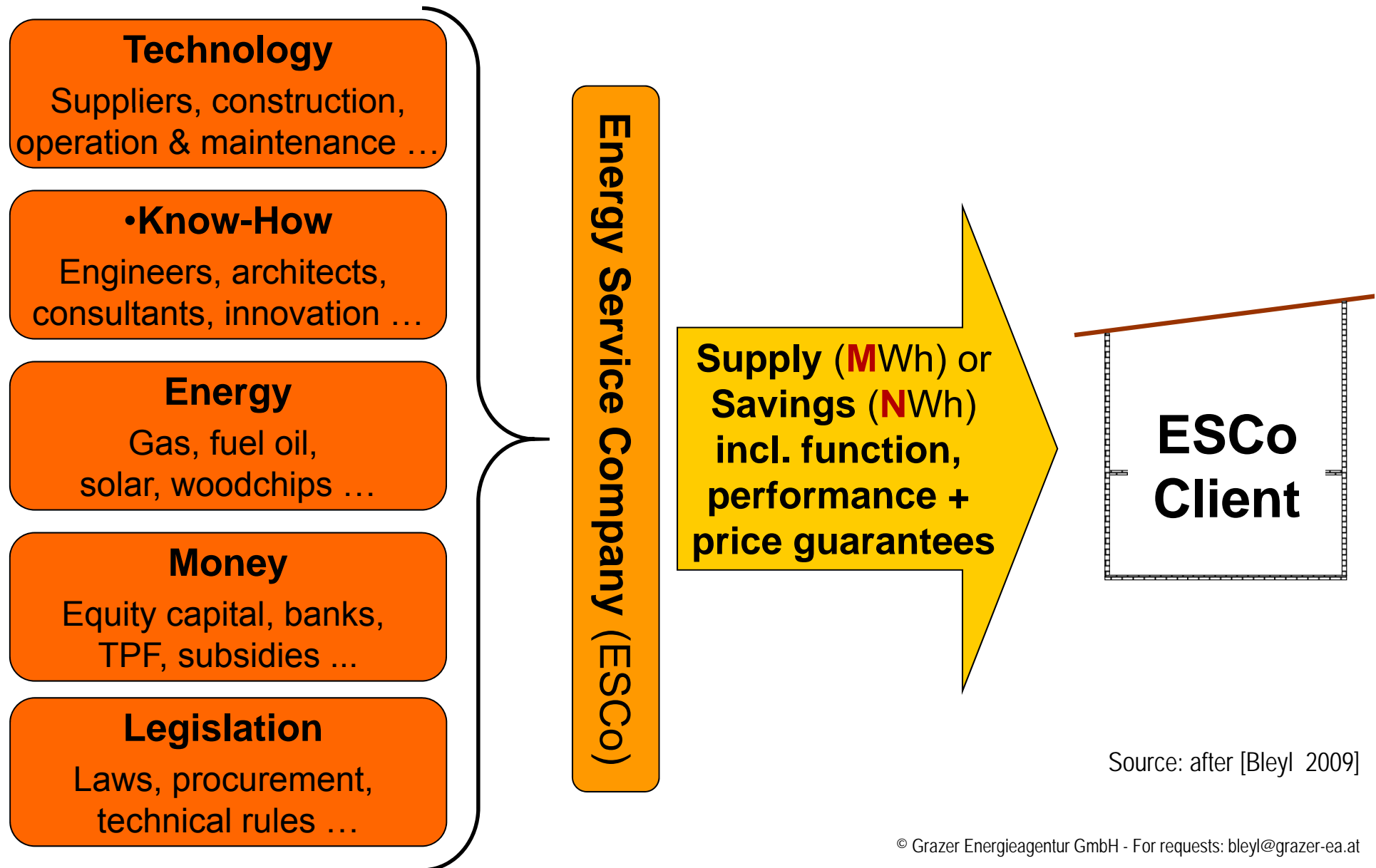


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1. What is a „real“ ESCo product?
2. Standard and innovative business models
3. Markets and types of ESCos
4. Market development: Facilitators are key!
5. Energy services and demand response
6. Two demand response examples
7. Discussion and Outlook

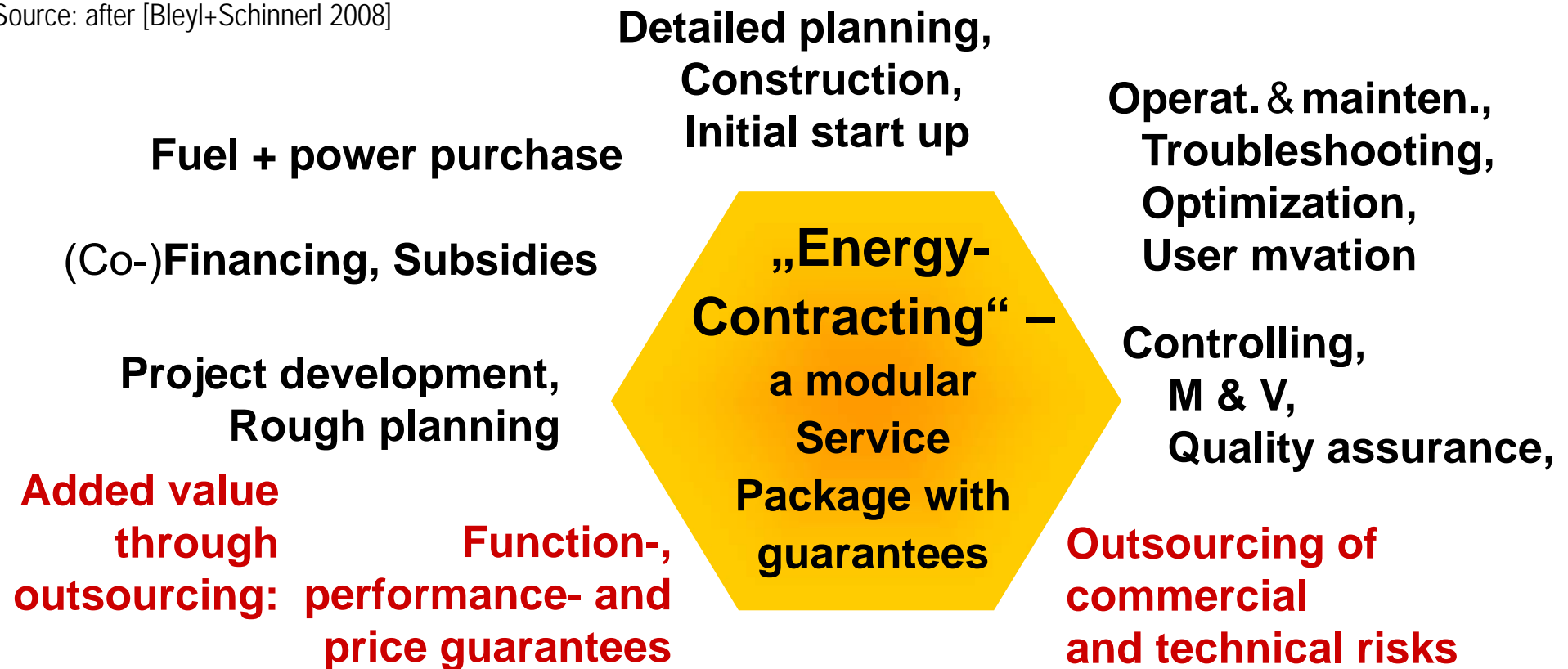
# What is Energy-Contracting / ESCo Services?

## An integrated service with results guaranteed



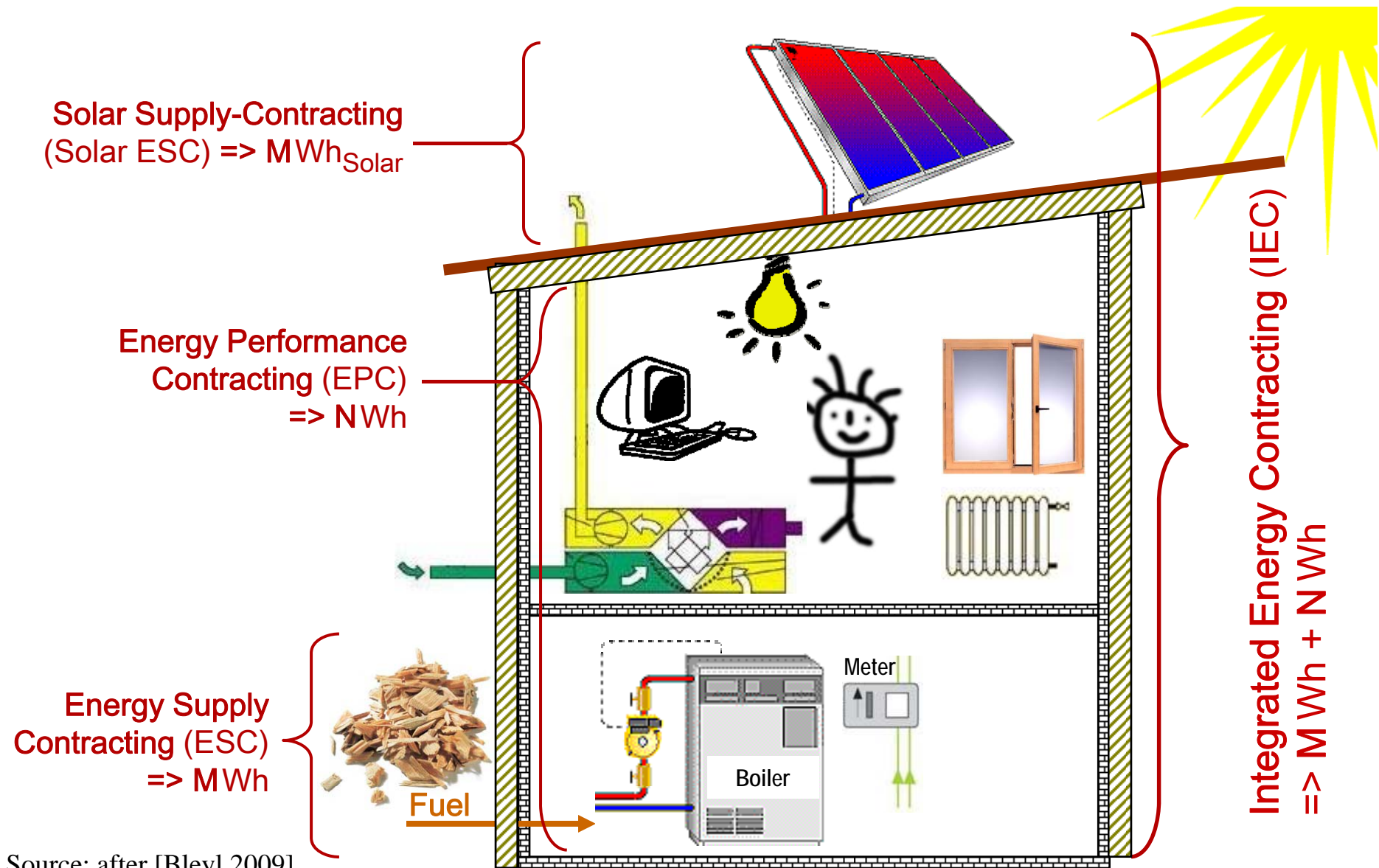
# Energy-Contracting: A modular Package with Success Guarantees

Source: after [Bleyl+Schinnerl 2008]



**=> “Energy-Contracting“ is the guarantee, that the overall system performs to specifications. Over the whole contract term.**

# ESCo business models and Scope of Services



Source: after [Bleyl 2009]

# What is Energy-Contracting?

## Task XIV Definition:



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***Energy-Contracting*** - also labeled as ***ESCo*** or ***Energy Service*** - is a ***comprehensive energy service product*** to execute ***energy efficiency projects*** in buildings or production facilities according to minimized ***project cycle cost***.

An ***Energy Service Company (ESCo)*** implements a ***customized efficiency package*** (consisting of planning, building, operation& maintenance, optimization, fuel purchase, (co-)financing, user motivation), ***takes over technical as well as commercial implementation and operation risks*** and ***provides guarantees for it's all inclusive cost and results***. Over the whole project term of typically 5 to 15 years.

*(after [Bleyl+Schinnerl 2008]): Bleyl, Jan W.; Schinnerl, Daniel "Energy Contracting" to Achieve Energy Efficiency and Renewables using Comprehensive Refurbishment of Buildings as an example in: Urban Energy Transition edited by Peter Droege, Elsevier 2008*

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# Two Basic ESCo Products (in German) Markets: ESC and EPC

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German ESCo market: ~ 1,600 Mio €/a [Prognos 2009]

Energy  
Supply-  
Contracting

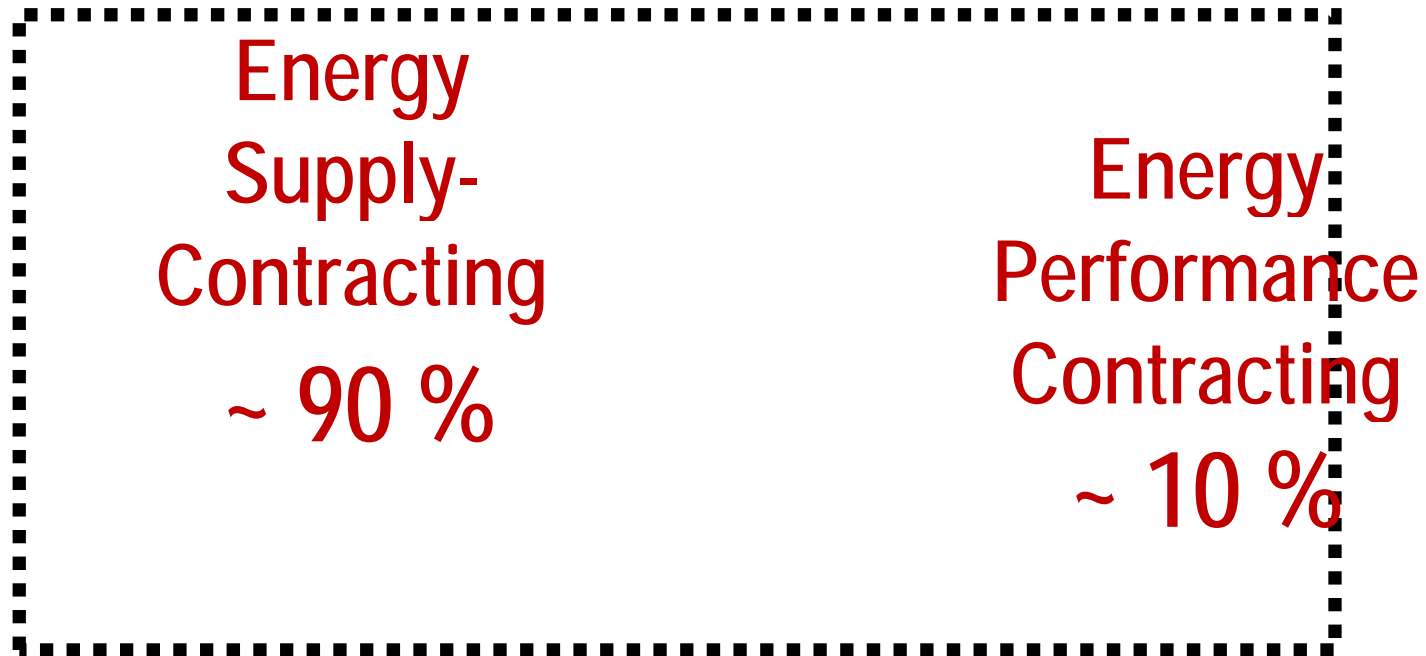
Energy  
Performance  
Contracting

Market shares?

# ESC is Dominating the Market

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German ESCo market: ~ 1.6 Bio €/a [Prognos 2009]

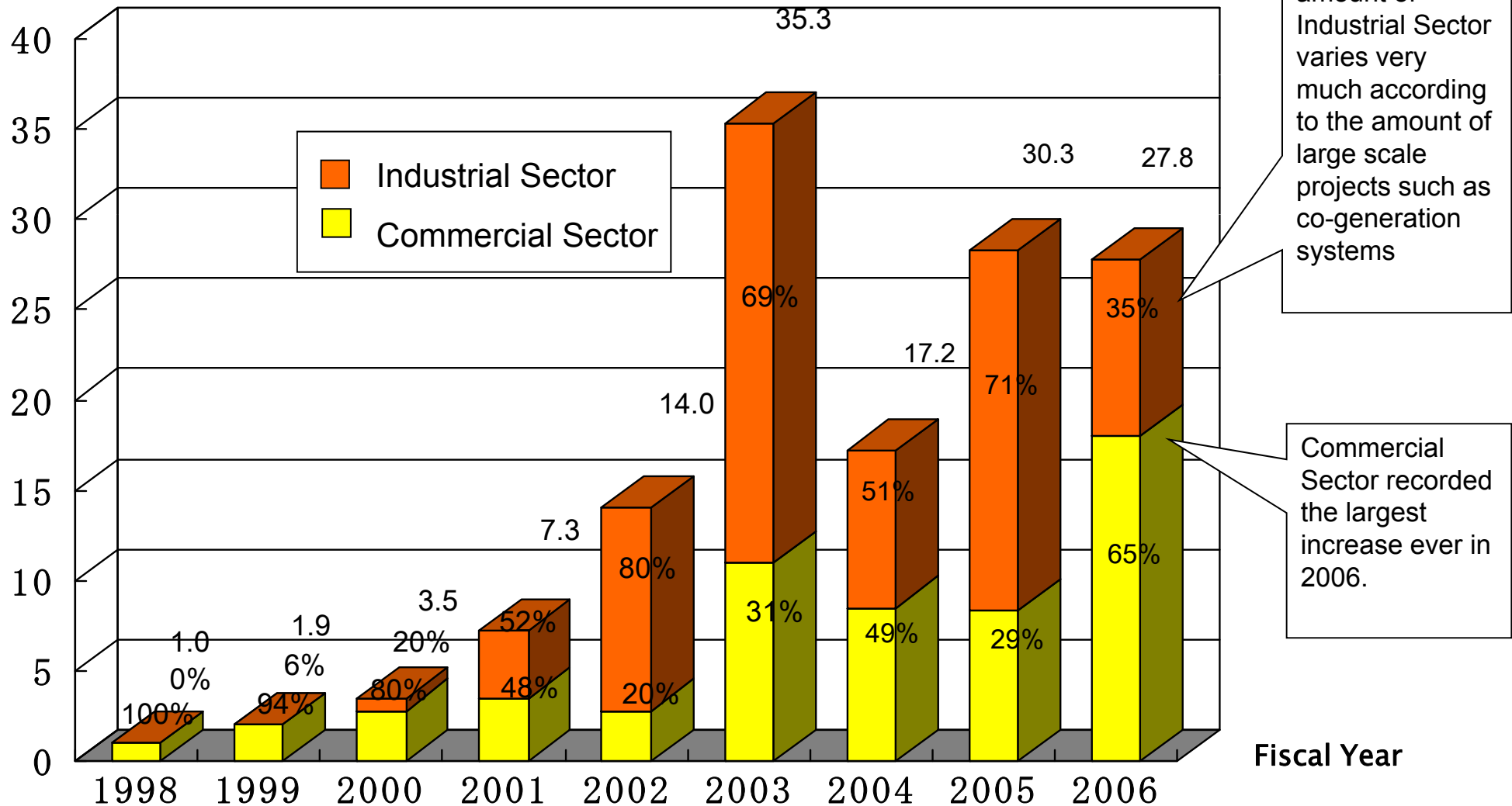


Sources: [Prognos 2009], [VfW 2009]



# Japan ESCO market: Contract Growth by Sector

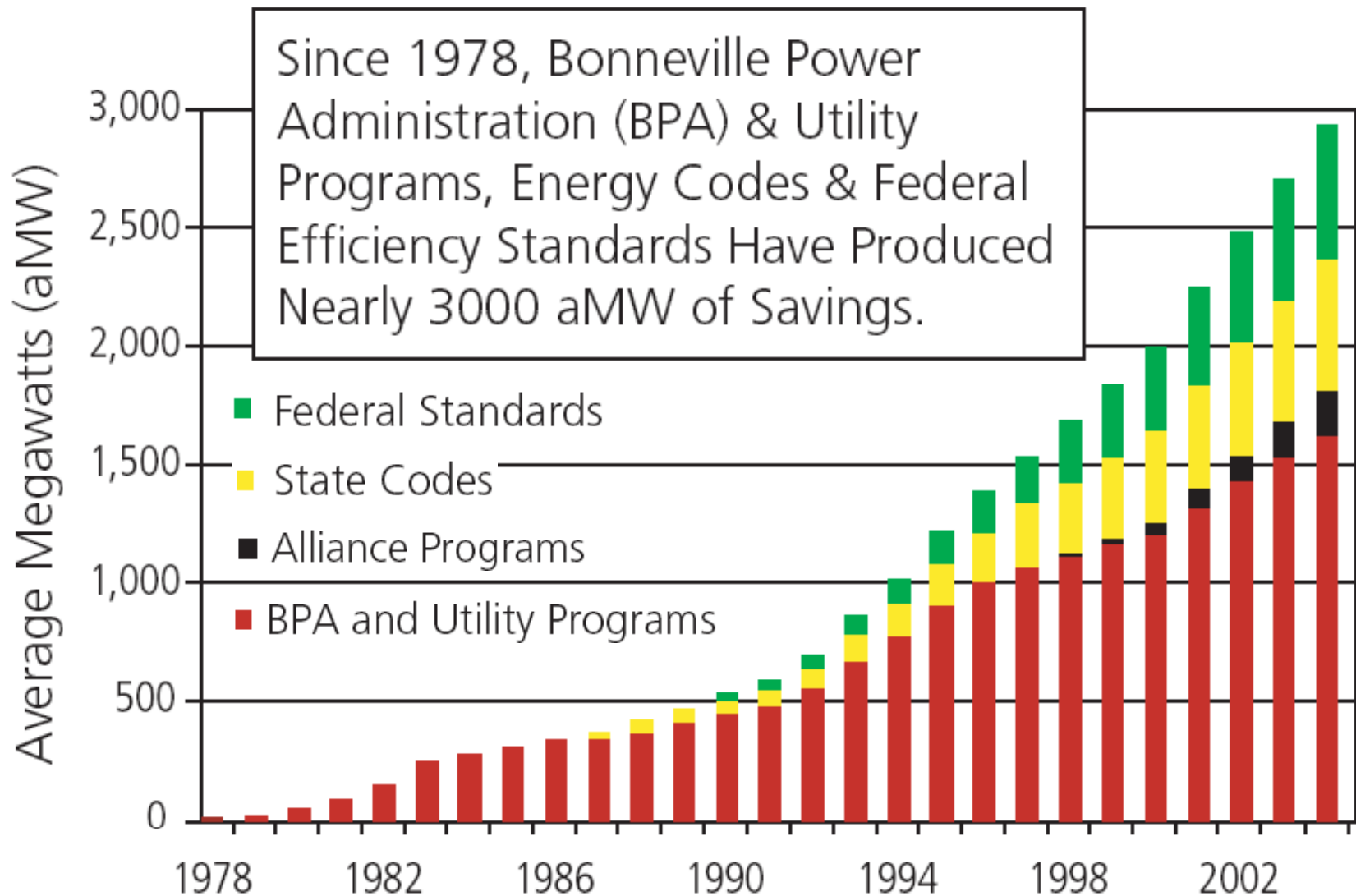
Billion yen      1 Billion yen = 0.63 Million euro



( Survey by Japan Association of Energy Service Companies )

# DSM / EE-achievements in Pacific Northwest (US) 1974-2004

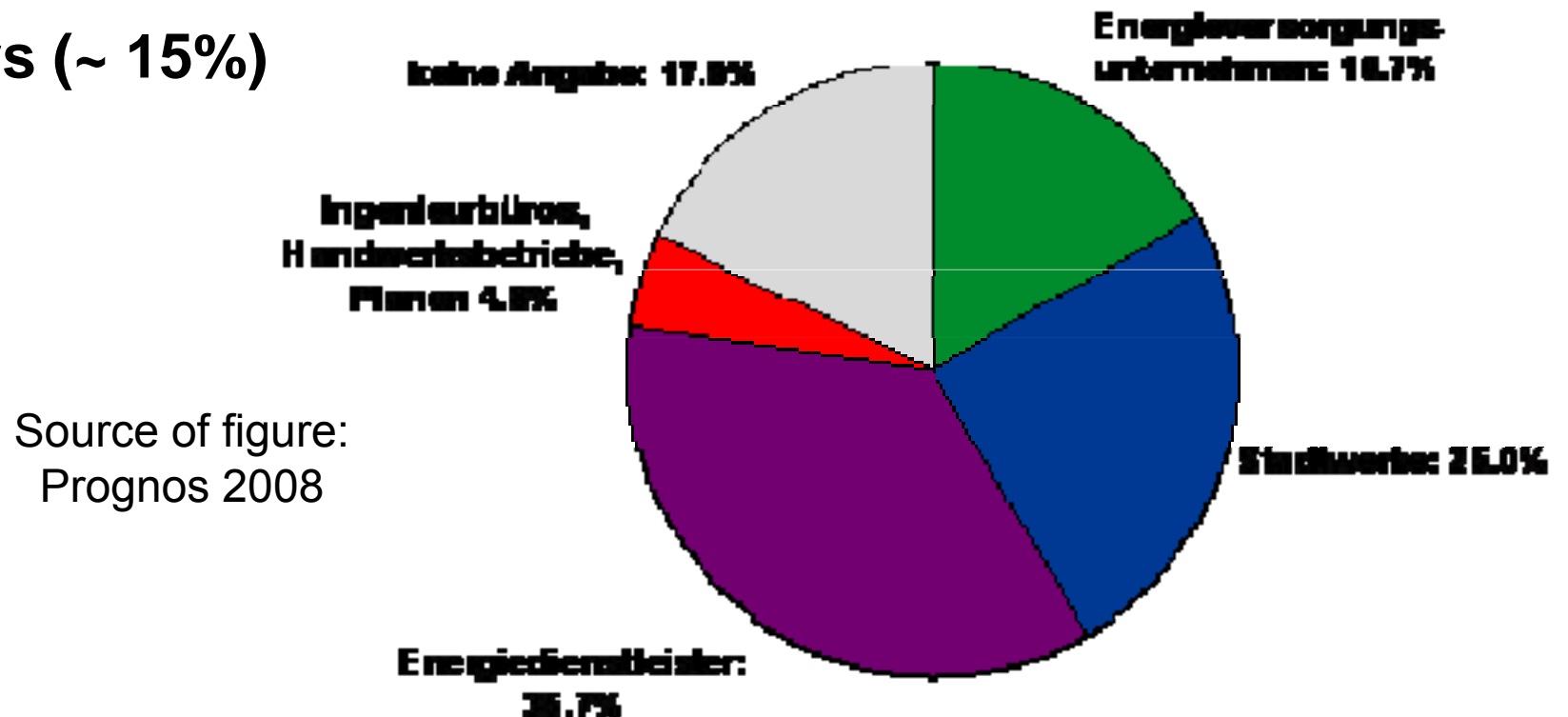
Source:  
US National  
Action Plan  
for EE\_2006



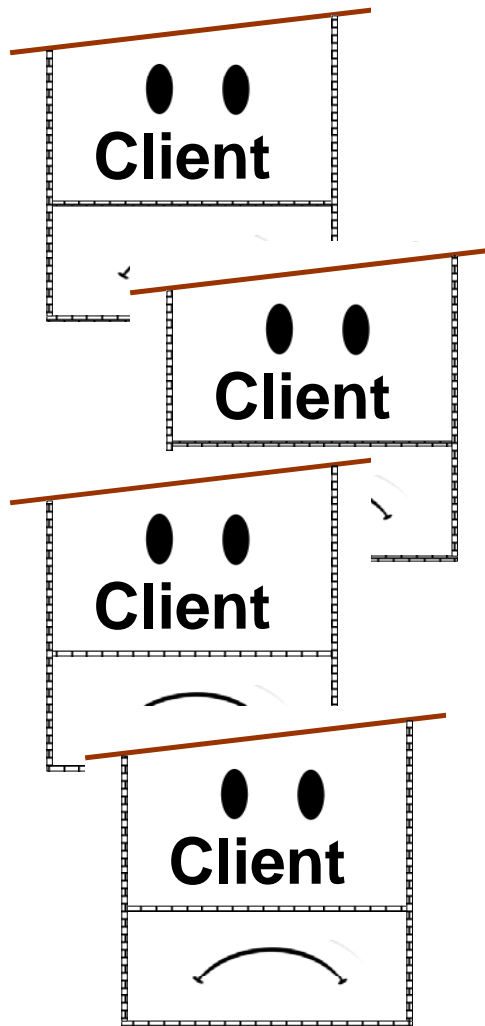
# What types of ESCo are in the market?

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1. Utility based ESCos (~ 40%)
2. Vendor/Equipment manufacturer ESCos (~ 35%)
3. Independant Broker / „Know How“ ESCos (~ 10%)
4. Others (~ 15%)



# Market development: Client Challenges on EE Market



?

Efficiency potentials  
technical solutions

?

LCC – Life cycle cost  
evaluation ...

?

What to do first and  
how to procure ...

?

How to design  
the contracts ...

?

How to secure  
the financing ...

?

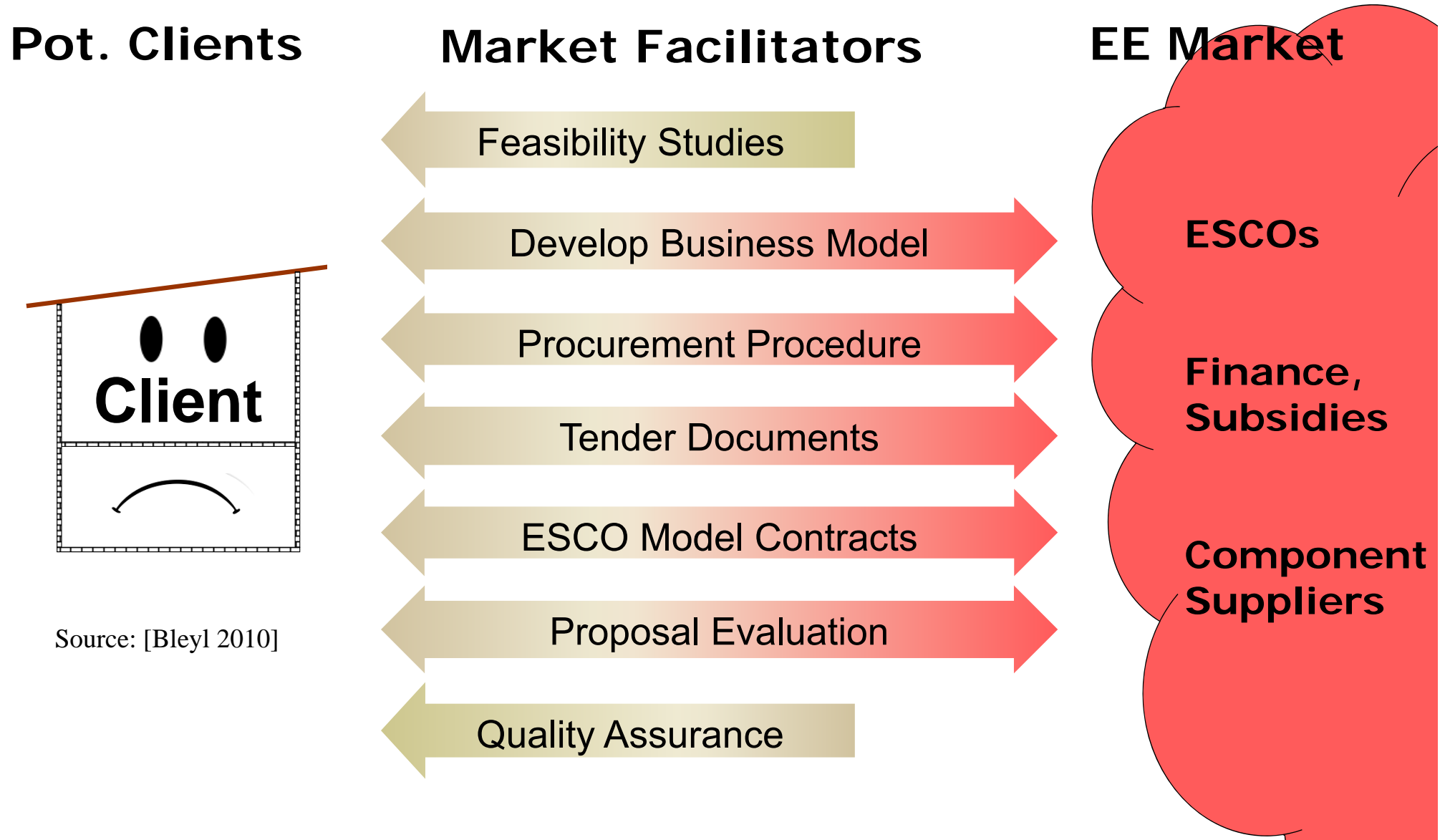
**EE Technologies**  
**Know-How**  
**Operation & Maintenance**  
(Project Components)

**Financing**  
**Subsidies**

**ESCOs**  
(General Contractor)

Source: [Bleyl 2010]

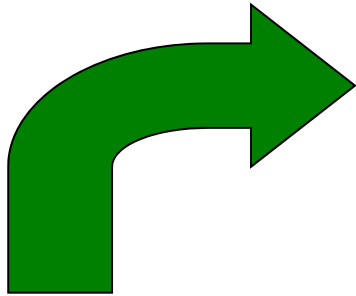
# EE Project Development: Project Facilitators Link Clients and ESCOs



## ESCos as potential allies for system operators ?

# What is Demand Response – an Analogy

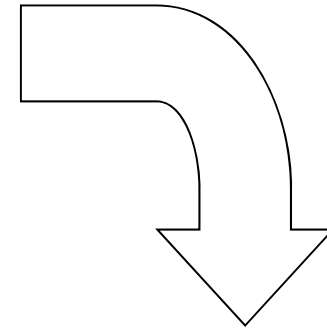
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**80 People show up  
for a flight**



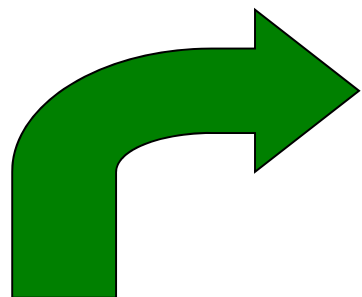
**Airplane only seats 70 people**



**Airline pays 10  
people (e.g. ticket  
vouchers) to take a  
later flight**

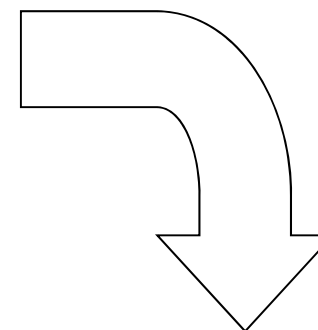
# What is Demand Response – an Analogy

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## Power Grid

Power Grid is limited to 70 MW



**Supply  
Ressources**

Grid needs 80 MW or  
Renewable supply falls short

**Demand  
Ressources**

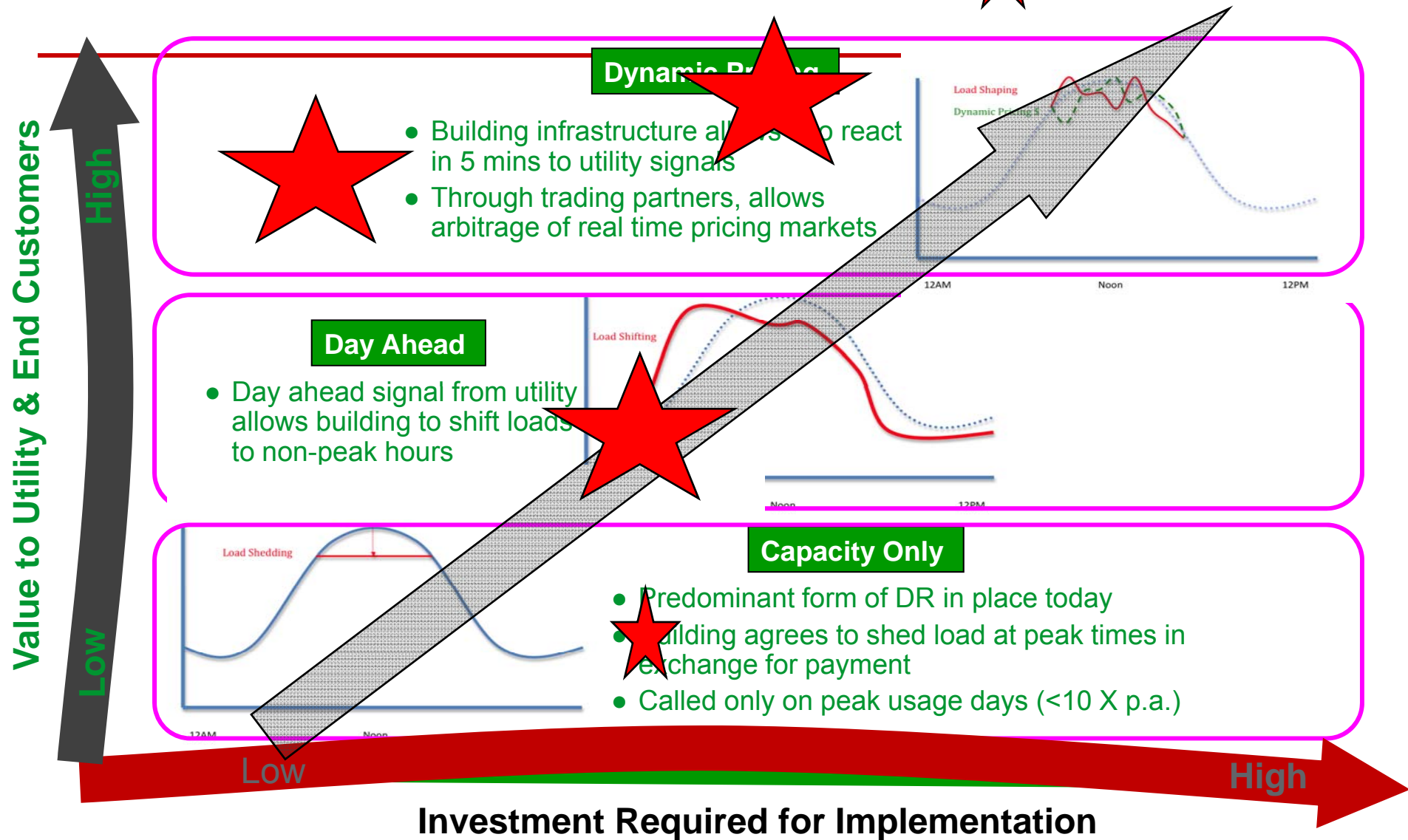
Power Grid pays  
consumers to shift  
10 MW to balance  
supply & demand.

***What is the motivation /  
added value for the consumer?***



# Smart Grid–Demand Management Evolution

## Goal: Identify Business Cases ★



# **„Schwarmstrom“ (= „flock of fish electricity“) by Lichtblick + Volkswagen, Germany**

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# Good practice: „Schwarmstrom“ Lichtblick + Volkswagen, Germany

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- ❖ **Vision: 100.000 decentralized CHP plants**
- ❖ **Capacity:  $20 \text{ KW}_{\text{elt}}$  x 100.000 installations = 2.000 MW**
- ❖ **Business model:**
  - Heat energy supply contract with building owner
  - CHPs are operated from a central control room
  - Lichtblick trades the electricity (demand response?)
  - Investment by Lichtblick and VW
- ❖ **Project start: 2010, current status: ~100 CHP installed**

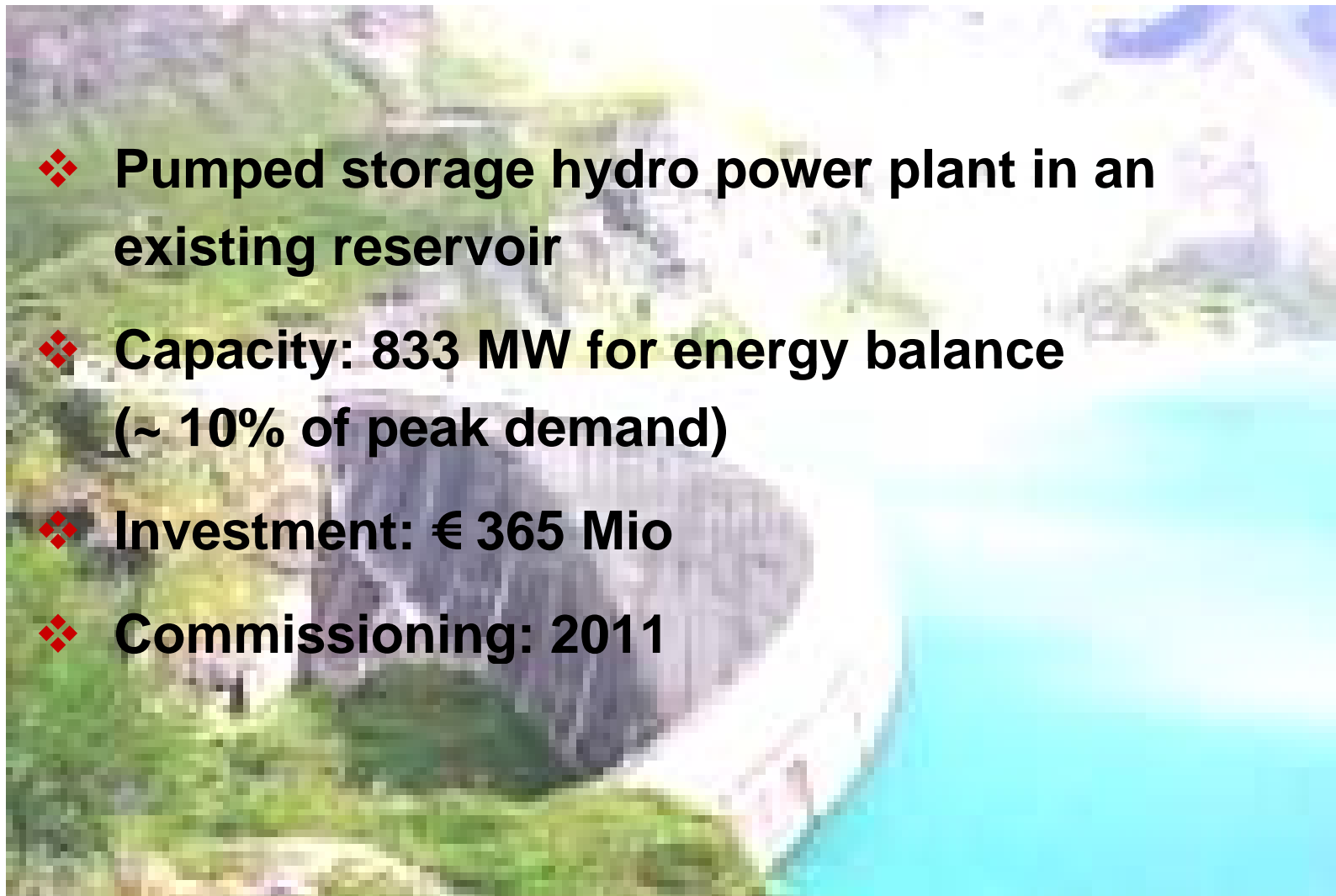
# Good practice: „Pumped-storage Hydropower plant“ Verbund, Austria

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# Good practice: „Pumped-storage Hydropower plant“ Verbund, Austria

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- ❖ **Pumped storage hydro power plant in an existing reservoir**
- ❖ **Capacity: 833 MW for energy balance (~ 10% of peak demand)**
- ❖ **Investment: € 365 Mio**
- ❖ **Commissioning: 2011**

# Discussion and Outlook



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1. Yes, ESCos can lift energy efficiency potentials and supply (renewable) energy.
2. ESCos provide services and are paid for their outputs.  
=> added value compared to standard in-house implementation
3. Energy-Contracting is a (market based) business model, which requires a business case. DR business cases?
4. DR-services: Who can create added value easiest: Retailers, Traders, TSO, DSO, ESCos (utility, vendor or broker?) ...?
5. IEA DSM Task XVI plans to address DR business cases



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**Thank you for your  
attention!**

# Reserve

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# ESCo Market Development - Some Lessons learned

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1. Successful **market development** - in particular for EPC - was **demand side driven**, meaning (pot.) ESCo customers defined their needs and goals for energy service packages and **put out request for proposals on the market**.
2. To foster market development, the role of **independent market facilitators as mediators between ESCos and their (potential) clients** has proved to be of great value (e.g. energy agencies). This facilitator role requires more active players and deserves better support + financing!

# ESCo Market Development - Some Lessons learned

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3. Contracting to an ESCo is a strategic **"make or buy"** decision of the (potential) client. Outsourcing to an ESCo competes with in-house implementation and has substantial implications on the outsourcing institution.
4. **Outsourcing requires new organizational routines**, in particular **on the customer side** (e.g. with regard to procurement practices, interdisciplinary co-operations between different departments and project engineers or long-term cross-budgetary financial management.)

# ESCo Market Development - Some Lessons learned

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5. **Energy efficiency often is not the driving force / not a stand alone business case** but a (beneficial) side effect. How can we incorporate EE better into other projects?
6. **Energy-Contracting is a flexible and modular energy service package.** This also implies the ESCo customer may define – depending on his or her own resources – what components of the energy service will be outsourced and which components he carries out him/herself.