

# The Future of Energy Systems in Austria and the Czech Republic

**Markus Radocha**  
**Grazer Energieagentur**  
office@grazer-ea.at  
[www.grazer-ea.at](http://www.grazer-ea.at)

# Graz

Capital of province of Styria

population: 250 000

Area: 128 km<sup>2</sup>

Altitude (av.): 368 m



Stadt **GRAZ** Umweltamt

[www.graz.at/umwelt](http://www.graz.at/umwelt)

**ÖKO**stadt Graz

**Grazer**  
**ENERGIE**Agentur

# Graz



European culture capital 2003  
UNESCO world heritage  
Town of universities  
ÖKOSTADT

Stadt **GRAZ** Umweltamt

[www.graz.at/umwelt](http://www.graz.at/umwelt)

ÖKOSTADT<sup>Graz</sup>

Grazer  
ENERGIEAgentur

# Ökostadt Graz-Awards



1996: European Sustainable City Award

2000: EXPO Hannover



2001: Bremen Partnership Award

2002: Dubai International Award for Best Practices to improve the Living Environment



# Graz- environmental strategy

## Environmental department

Stadt **GRAZ** Umweltamt

- Strategic planning, realization and evaluation of environmental programmes „Ökostadt 2000 / Lokale Agenda 21 and „Kommunales Energiekonzept“
- Main focus
  - Ökoprofit ® (environmental precautions for companies)
  - Thermoprofit (benefit through reduced energy consumption)
  - Ökodrive (Biodiesel made from pre-used edible oil for buses)
- Items of written comment for air, waste, energy
- „Green telephone“

# Energy Agencies in Austria



## Network of local and regional Energy Agencies

(EU-Project „SEANCE“)



Energieverwertungsagentur E.V.A.  
Landesenergieverein Steiermark  
Energieinstitut Vorarlberg  
Energie Tirol  
OÖ Energiesparverband  
Energiebewusst:Kärnten  
Energieagentur Waldviertel  
Energieagentur Weinviertel  
Lokale Energieagentur Oststeiermark  
Energieagentur Judenburg/Knittelfeld/Murau  
Energieagentur Weststeiermark  
Grazer Energieagentur

# *The Team of the Graz Energy Agency*



# Mission of Graz Energy Agency

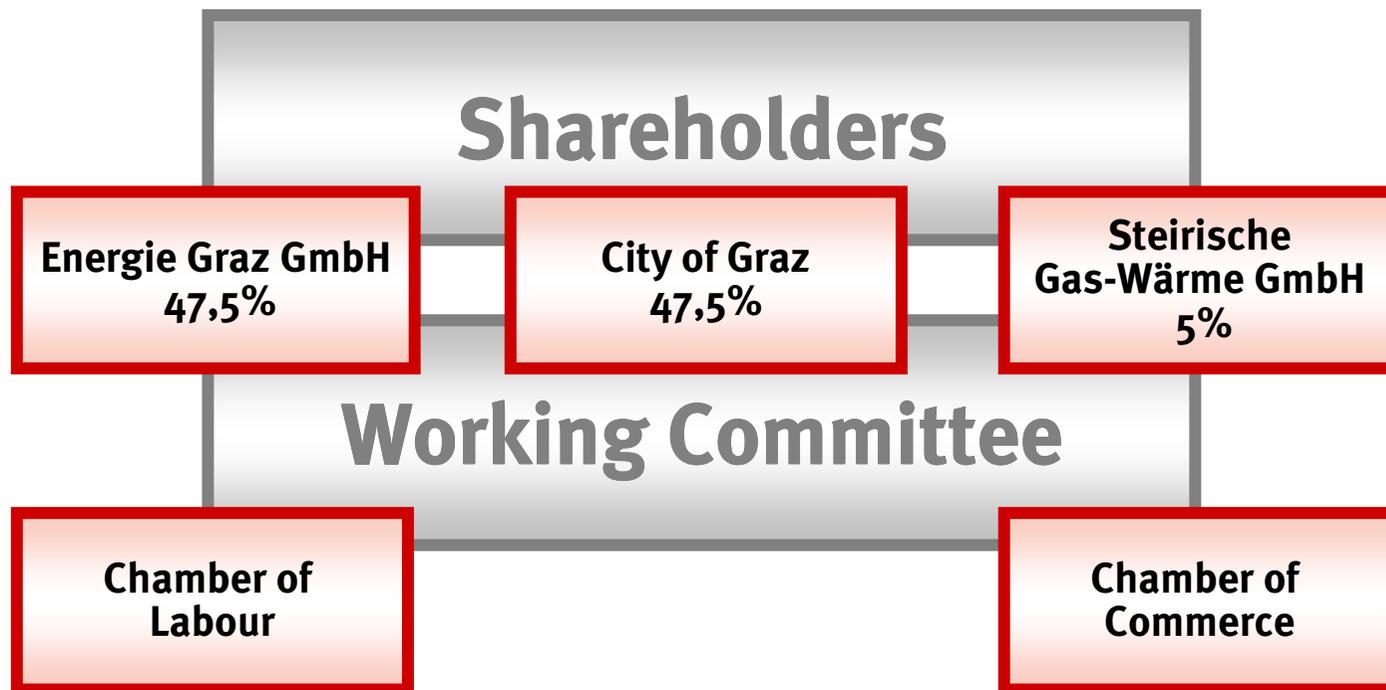
Increasing **Energy Efficiency** and the use of **Renewable Energy** sources through innovative organisation and financing models -  
in order to **stimulate the economy** and the labour market in the region and to implement **energy and environmental policies**.

## Our roles:

- **Initiation and implementation of innovative energy projects**
- **Competence centre for the market development of innovative services and technologies**
- **Agency for the implementation of the energy and environment policy of the City of Graz and other public bodies**

# Shareholders & Structure

*The Graz Energy Agency Ltd.*



# ***Core Competences***

- **Performance Contracting, Third Party Financing**
- **Building renovation**
- **Energy Efficiency (small CHP, lighting, appliances etc.)**
- **Renewable energy (solar energy, biomass)**
- **Project management, also international projects**
- **Market development (**Thermoprofit-Program**)**

# ***Thermoprofit***

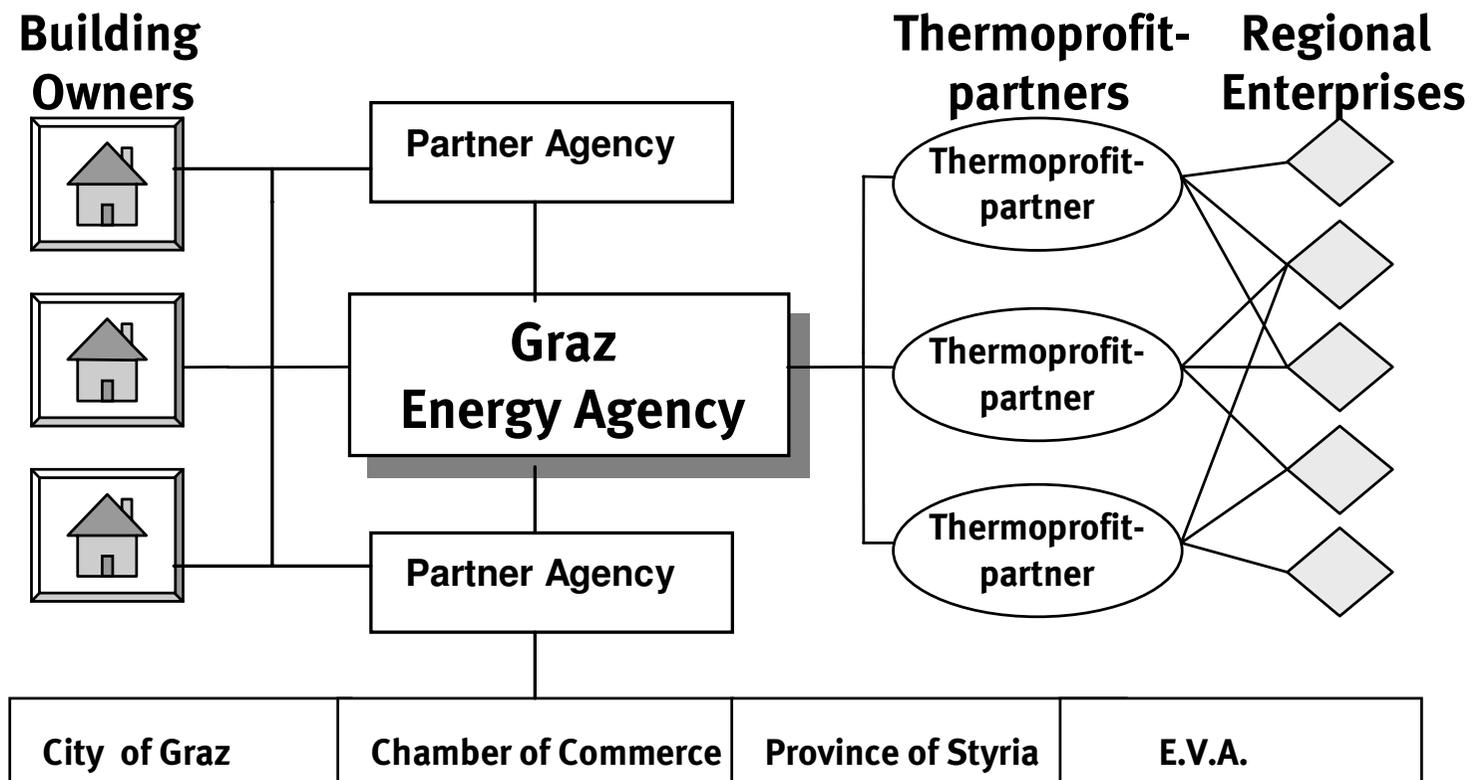
## ***Impulse Programme to stimulate the Market for Energy Services***

***A **trade mark** for total service packages to reduce energy consumption in buildings***

- guaranteed benefits
- proved quality



# The Thermoprofit-Network



# ***The Question***

**Can buildings be made  
more energy efficient . . .**

**→ with guaranteed savings ?**

**→ without own investment capital ?**

**→ long lasting ?**

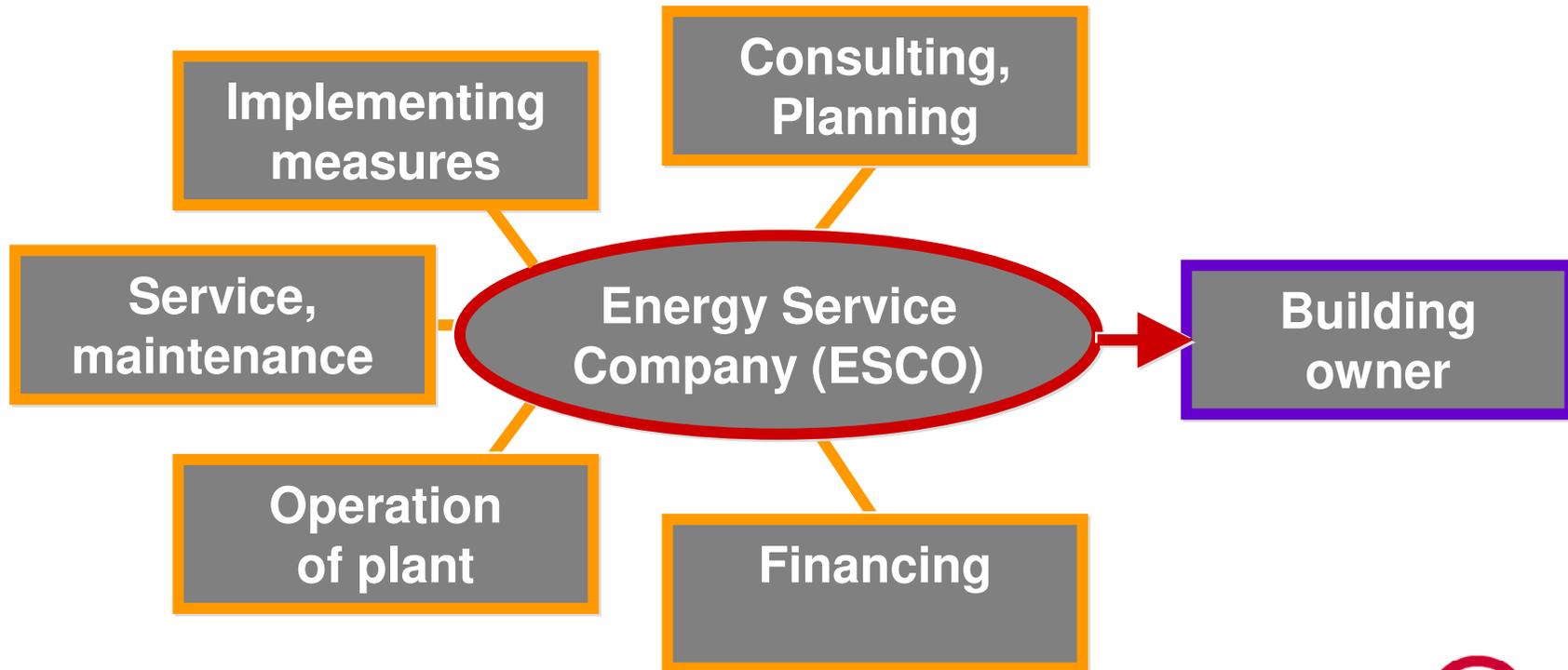
# *The Answer*

**Energy Performance Contracting**

**to reduce energy consumption in buildings**

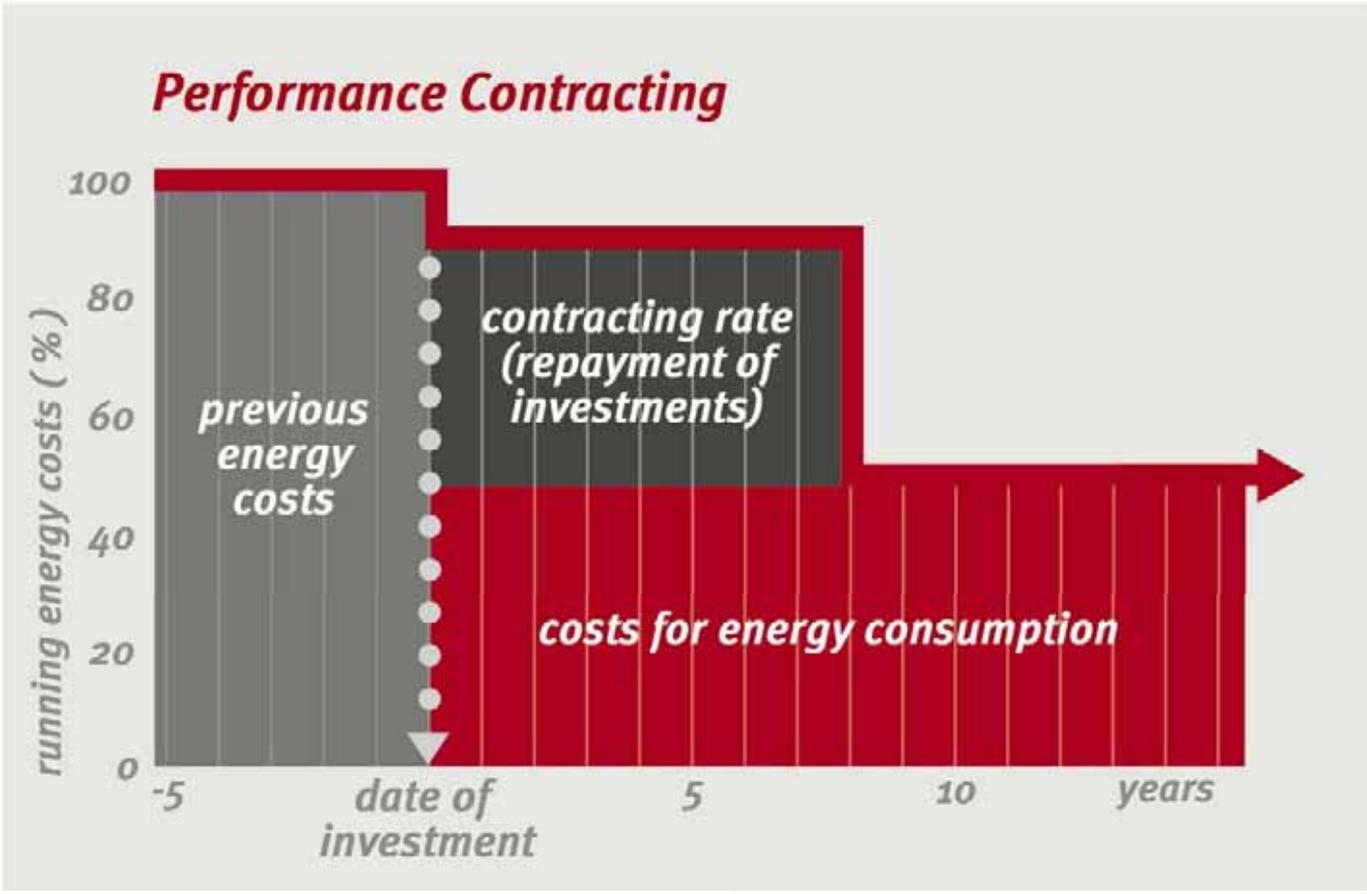
# What is EPC ?

## 1. All services from one source



# What is EPC?

## 2. Innovative Financing Model



# ***What is EPC?***

## **3. Guarantees**

- **Guarantee for energy savings or for upper limit of energy costs**
- **Guarantee for the performance of the building (comfort levels, e.g. temperature)**
- **Guarantee for the reliability of the energy facilities**

# *The Austrian EPC Market*

- **about 500 to 600 buildings already optimised by EPC**
  - compared to almost zero in 1998
  - represents roughly 5% of the „EPC potential“ in the public and „near public“ sector
- **main customers / driving forces**
  - federal building administration
  - larger cities (Graz, Salzburg)
  - small and medium-sized municipalities
- **Dissemination of EPC by energy agencies and other „mediators“**
  - independent help for building owners
- **Austria is – together with Germany – an EPC pioneer in Europe**

# ***EPC: An All-Winner Model***

## ■ **Building owners and energy users:**

- Investment and reduction of running energy costs without own investment capital
- Better living - and working quality and appreciation of buildings
- Using the specialised know-how of the Energy Service Companies
- Service package from one source
- No lack in human resources - planning and investments carried out by ESCO
- Guarantee: ESCO takes the risk

## ■ **Energy businesses, ESCOs:**

- Offer a complete solution
- Open new business fields

## ■ **Population:**

- Reduction of pollutant and CO2 emissions
- Impulses for the local economy

# Thermoprofit-Projekt „Joanneum Research“

## Office building of Joanneum Research company

- Year of construction: 1962, Floor space: 6543 m<sup>2</sup>
- Thermal renovation and energetic optimisation
- Improvement of the building
- Increase of the user comfort
- economic effects
- Guaranteed savings/year: 36.000 Euro, 30% (incl. heat, electricity and water)
- CO<sub>2</sub> reduction: 99 t/a
- Typical heat use value: 37 kWh/m<sup>2</sup>a
- Saving of drinking water: 7.400 m<sup>3</sup> /a
- Investment: 1,5 Mio. Euro
- Contract duration: 15 years



# ***Comprehensive renovation „Daungasse“***

## ***Residential buildings of GGW housing company***

- Year of construction: 1967, Floor space: 7.500 m<sup>2</sup>,
- Measures: Installation of a central heating system (gas), Solar collector (85m<sup>2</sup>) insulation of the external walls, energy management, etc.
- Investments: 2,18 Mio Euro
- Energy savings: 24.490 Euro, - 45%
- Duration: 15 years
- Economical overall optimum
- No extra costs for tenants
- Guaranteed upper limit of the heating costs



# ***PV-Installation for the “Helmut List Halle“***

**Home of cultural festivals- Styriarte & Steirischer Herbst**

**Largest facade-integrated PV-installation in Austria**

**Link between culture - high tech - environment**



- 350 m<sup>2</sup> PV-Cells
- Polycrystallin
- 38 kW peak
- output 26.000 kWh/a
- Contract duration 15 years

# ***Solar plant Liebenau Stadium***

## **Feed in for district heating network of Graz**



- Pilot plant, area 1407 m<sup>2</sup>
- max output 0,8 MW
- No large storage – dist. heat consumption 10 MW min
- 600 MWh per year
- CO<sub>2</sub> reduction per year: 250 tons
- Contract duration 15 years

# Streetlighting “Greenlight Graz 1”

## Replacement of 720 mainstreet luminaires



- electricity costs 1,1 Mio Euro
- 4200 operating hours
- reduction of 10 minutes a day  
-> -1,5% energy costs
- replacement of 720 luminaires  
-> - 530.000 kWh per year or 58%
- Contract duration 15 years

# Streetlighting “Greenlight Graz 2”

## Optimization of 15.000 luminaires



- electricity costs 556.000 Euro/ year
- measures:
  - traffic signals- LED
  - christmas lighting
  - solar lighting
  - outdoor lighting
  - control systems
- reduction 820.000 kWh per year
- contract duration 25 years

# CHP-Stirling Engine “Stukitzbad”

## Small scale CHP



- outdoor swimmingpool (surface 1,850 m<sup>2</sup>), well-being area, sauna
- two gas fired Stirling Modules
- 6500 operating hours/ year
- overall efficiency is more than 90%
- CO<sub>2</sub> reduction per year: 250 tons
- Contract duration 15 years



***Thank you for  
your attention!***

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

