

ΣΥΝΕΡΓΕΙΑ
WTER
Greece - Ελλάς

Συμβούλιο Ενεργειακής Αξιοποίησης Αποβλήτων
Waste-to-Energy Research and Technology Council
Πρωθώντας την Αειφόρο Διαχείριση Αποβλήτων

SYNERGIA

**Waste-to-Energy Research and Technology Council
(GREECE)**

Dr. Efstratios Kalogirou, President

**WASTE MANAGEMENT IN GREECE &
POTENTIAL FOR WASTE - TO - ENERGY**

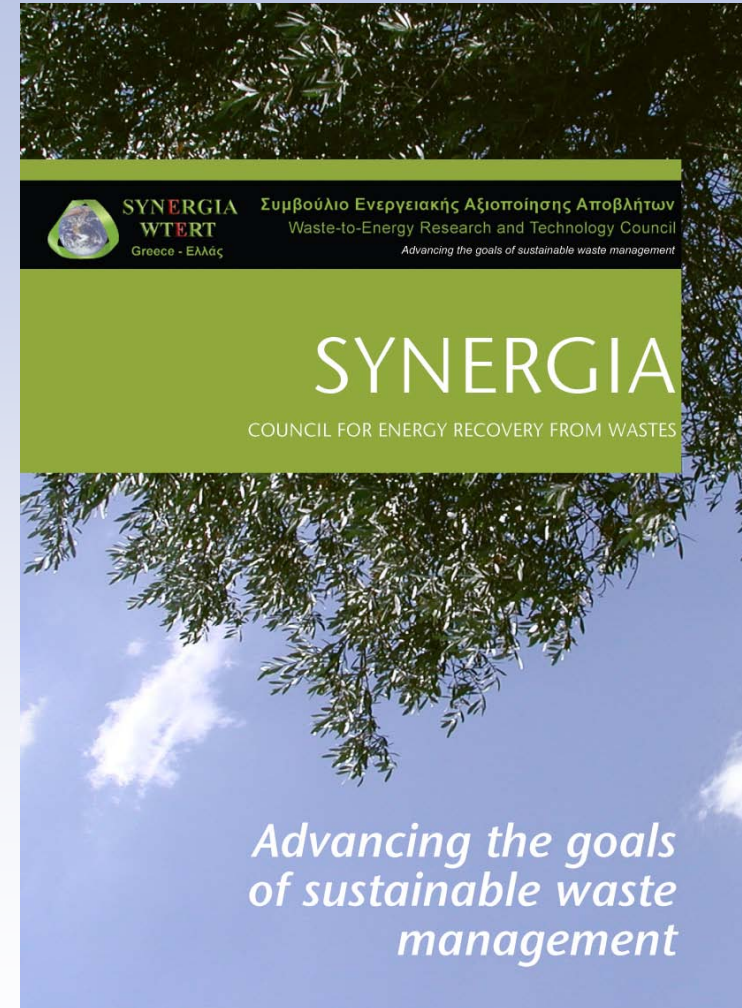
*WTER Biannual Meeting at Columbia University
New York City, October 7th - 8th 2010*

[**www.wtert.gr**](http://www.wtert.gr)

SYNERGIA – Waste to Energy Research and Technology Council

The Waste-to-Energy Research and Technology Council (SYNERGIA, www.wtert.gr) was founded on July 2008 by the above founding members:

- The Earth Engineering Center of **Columbia University**, New York
- Members of the Thermodynamics and Transport Phenomena Laboratory, School of Chemical Engineering, **National Technical University of Athens** (N.T.U.A)
- Members of the Laboratory of Heat Transfer and Environmental Engineering, Department of Mechanical Engineering of the **Aristotle University of Thessaloniki** (A.U.TH.)
- The Greek Company INTRAKAT



Recent Presentations of SYNERGIA

- 29/1/09: Presentation to the Special Permanent Committee of Environmental Protection of the **Greek Parliament**
- 20/3/09: **Presentation to the Rhodes Municipalities** for the construction of WTE plant on the island
- 5/5/09: **SYNERGIA Conference in Kozani**
- 19/5/09: Presentation on **17th NAWTEC, USA**
- 19/6/09: **1st SYNERGIA FORUM in Athens**
- 30-31/10/09: **7 Presentations** on the 3rd International Conference of the **Hellenic Solid Waste Management Association**
- 10/6/2010: **2nd SYNERGIA FORUM in Athens**





Shanghai/Pudong WTE Plant

6-7th of May 2010:

Arnoldstein, Austria

02-07th of August 2010:

Yuqiao WtE Plant in Shanghai
Pudong and Chnoggqing
Tongxing WtE Plant

12-15th of October 2009:

Lipor Portugal 500.000 tpa, MSW

11th of December 2009:

Toulon, France 300.000 tpa MSW

25-26th of February 2010:

Acerra/Naples (Italy), covering
electricity needs for 230,000 families.



Naples WTE Plant

1. NTUA, Greece

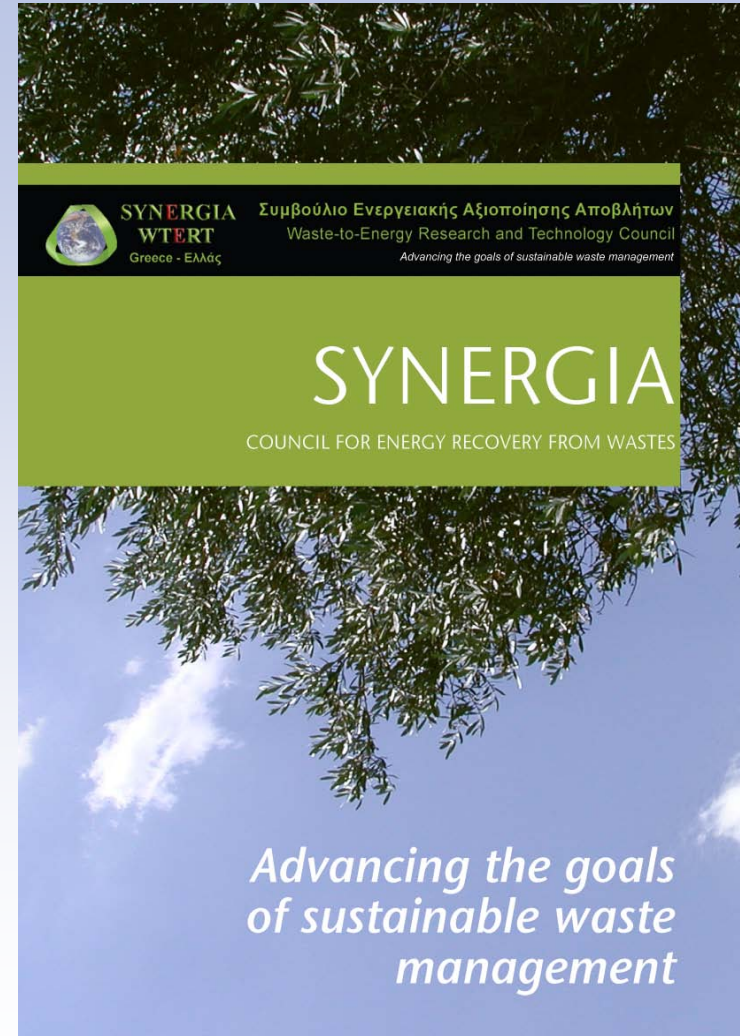
“Experimental Study of Stabilization of WTE fly ash”

2. AUTH, Greece

“Beneficial Uses of WTE Bottom Ash”

3. EEC, Columbia University

“Study of Effects of Pre-processing & Pre-shredding Greek MSW and Analysis of Plasma Processes for Gasifying MSW”





Sister Organizations of WTERT Greece (SYNERGIA)



www.wtert.com



www.wtert.ca



www.wtert.cn



www.wtert.eu

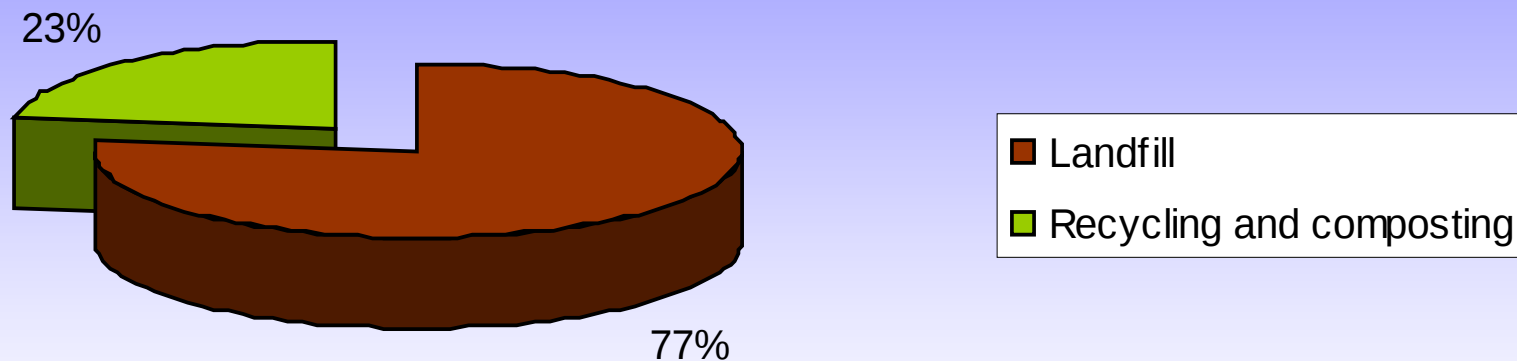


www.wtert.com.br



www.wtert.jp

Waste Management in Greece



*Eurostat 2008

Waste Management in Greece

- ➔ According to new elements that the Greek Government published in July 2010, in Greece there are still **274 illegal active dump sites** and **442 in restoration process**



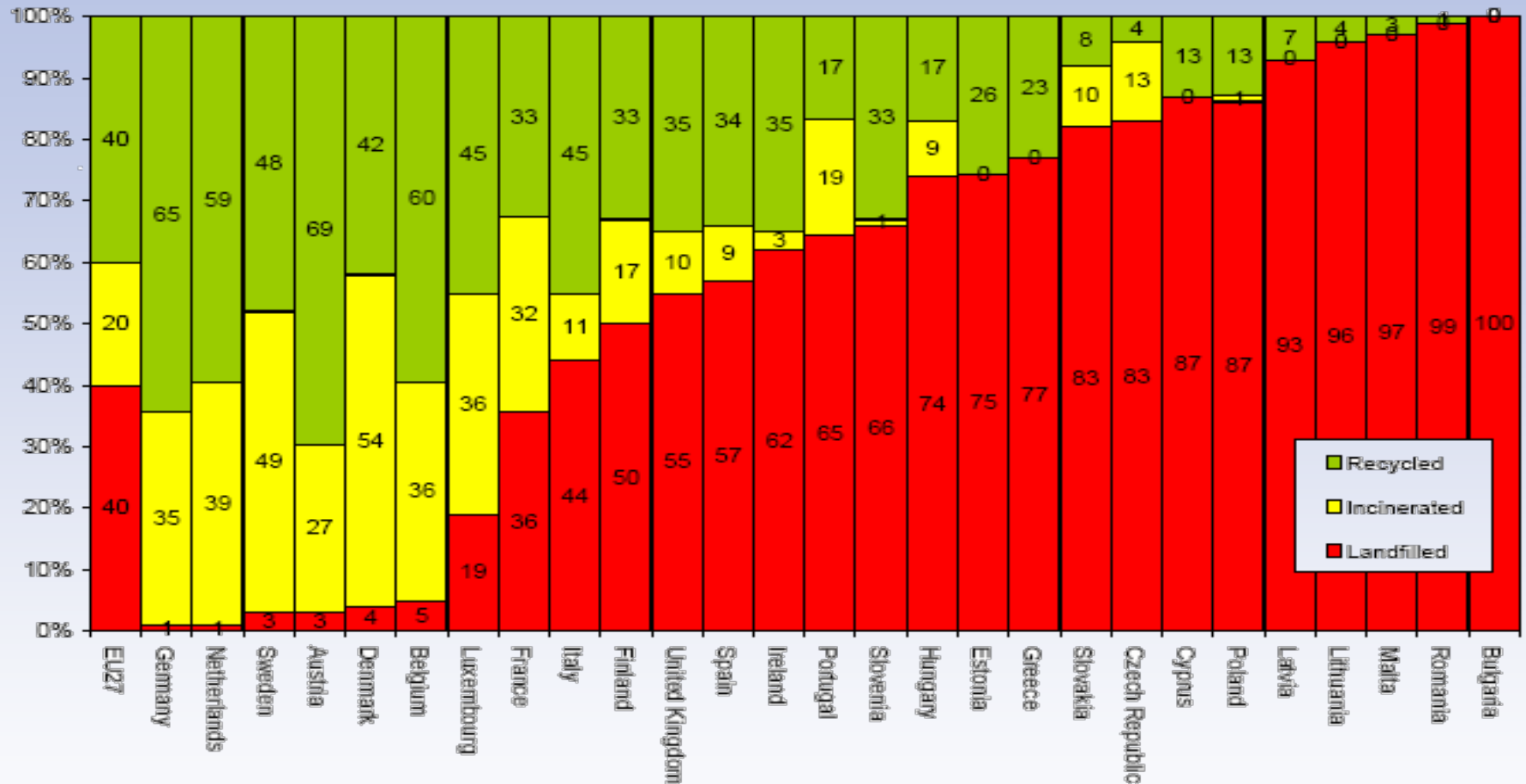
➔ In Greece there are **5 Mechanical Biological Treatment plants**

1. Ano Liossia (Athens)
2. Chania (Creta)
3. Heraklio (Creta)
4. Kefalonia
5. Kalamata

**However, MBT at the tail end
absolutely needs WTE (for RDF/SRF)**



Thermal Treatment and Recycling



➔ It is instantly obvious that in the E.U. recycling is excellently combined with waste to energy, whereas in countries where landfill is dominant, recycling and waste to energy are lagging behind (chart based on **EUROSTAT, MSW 2008**)

- ➔ According to Greek Legislation **L. 3468/2006, and L. 3851/2010**, the **biodegradable fraction** of industrial and municipal solid waste” is considered **biomass, thus R.E.S and has a significant price for electricity via WTE, 87.85€/MWh**
- ➔ According to data from **CEWEP**, the fraction of waste considered as R.E.S. from the following countries is:
 - **France: 50%**
 - **Holland: 47%**
 - **Switzerland: 50%**
 - **U.S.A.: 66%**
 - **Denmark: 80%**

SYNERGIA's Proposal for Greece

	Capacity (tpa)	Residual (tpa)	Electricity Power Production (MWe)	Inhabitants for electricity supply
Proposal 1	400.000 MSW	80.000	33	150.000
Proposal 2	700.000 MSW	150.000	58	250.000
Proposal 3	700.000 MSW + 300.000 SRF/RDF	200.000	100	420.000

1. Gate fee:

- ✓ Large WtE plants: 50 - 70 € per tone
- ✓ Sanitary landfill cost: 40 - 60 € per tone
- ✓ As it is obvious the cost per capita in case of WtE method will be raised from 25 € per annum to 35 € per annum, by having solved the waste management in Greece

2. Compensative benefits for Municipalities:

- ✓ Electricity production
- ✓ Steam supply for district heating and/or district cooling

Location of the Environmental Park in Rhodes Island



Capacity: 160,000 tpa

Operation hours: 8000

- Electricity supply to the power grid, **11 MWe** (90 GWhe)

Air Pollution Control System:

- Electrostatic Filters
- Dry Scrubbers (for SO₂ + HCl control)
- Activated carbon injection
- SNCR (for NO_x control)
- Fabric Filters baghouse

SYNERGIA as the first Scientific and Research Council in Greece recommends for WTE:

- ➔ To develop an **integrated recycling system** based on **recycling and composting of preselected organic at the source**. To stay away from mistakes and omissions from the past.
- ➔ To implement the **environmentally friendly and energy efficient thermal processing of municipal solid waste**.
- ➔ To follow the **proven and dominant practice** of our European fellows and adopt waste to energy through incineration.

- The technology of thermal treatment with energy recovery is used in more than **432 plants across Europe**, located even inside European capitals, which in combination with recycling at the source, consists of an integrated and proven waste management practice
- The European Green Capitals (Stockholm, Copenhagen, Paris) use a combination of recycling at the source and thermal treatment with energy recovery
- **Efforts of SYNERGIA to help other Balkan countries** to bring in sustainable waste management, like Serbia (WTER/SERBIA under construction with SeSWA), Bulgaria, etc.

Spittelau Waste to Energy Facility WTEF, Vienna



Spittelau - Vienna

Examples of WtE plants – Photographs

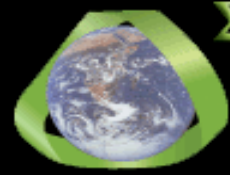


“Isséane” Plant - Paris

Examples of WtE plants – Photographs



[Brescia - Italy](#)



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Thank you for your attention

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