

D. Kallidromitou¹, K. Korizi¹, K. Aravossis²

¹Epsilon SA, Monemvasias 27, GR-15125, Marousi, Athens, Greece

²2National Technical University of Athens – Athens - School of Mechanical Engineering Section of Industrial Management and Operational Research, *Zografou Campus*, *Heroon Polytechniou* 9, 15780 Zografou, Greece



Waste management plan for Greece

The study on the revision of the national waste management plan (NWMP) has been completed in November 2014. The NWMP has been officially adopted in December 2015.

Implementation period 2015-2020

The NWMP covers all the waste streams under the auspices of the Waste Framework Directive (Directive 2008/98/EC)

The NWMP builds upon

- the requirements of EU and Greek legislation
- the status and progress made in Greece over the previous implementation period
- -the Resource Efficiency Flagship Initiative under the Europe 2020 Strategy, the Roadmap to a Resource Efficient Europe and the 7th Environment Action Programme to 2020

The NWMP is of a strategic nature, whereas regional plans that follow are the operational plans with detailed descriptions of the required waste management infrastructure and networks for each region





New Greek policy on waste management

Key elements of national policy on waste:

- ✓ Establishment of an integrated management planning on all waste streams at national and regional level, taking into account national and regional spatial planning and special arrangements for island territory and remote areas.
- ✓ Ensuring high level of protection of the environment and human health. Self-sufficiency of waste management infrastructure and networks has been reached, waste data registration has been integrated and inspections on waste management cycle have been satisfactory.
- ✓ Encouragement of resource efficiency through the prioritization of actions and measures that support preparing for reuse and recycling activities, as well as through the optimization of extended producer responsibility schemes.
- Upgrading of waste management services and encouragement of public awareness and participation.
- ✓ Streamlining the cost of waste management services and promotion of economically and environmentally sustainable investments in the waste sector

General objectives of the NWMP

- Stabilization of waste generation to 2011 levels, with a declining trend
- Completion of the waste management infrastructure network
- Optimal utilization of the non-recyclable waste's energy content
- Minimization of the landfilled recyclable waste
- Standardization of secondary waste products at least for compost and waste-derived fuels
- Systematic data collection system and waste registry in place
- Reformulation of the central system for monitoring of waste management
- Development of a national communication strategy regarding waste management
- Review of the regional waste management plans
- Eradication of open dumps for MSW and for other waste streams
- Rational management of historically accumulated wastes
- Reclamation of contaminated disposal sites



Industrial waste – Current status

Reference year: 2011

Generation

17.2 million tonnes annually, of which 136 thousand tonnes are hazardous waste

- The sectors which mostly contribute in the total generation of industrial waste are the manufacturing and energy sectors
- Excluded are certain types of waste that are generated on the industrial businesses' premises: MSW, C&D waste, waste oils, waste batteries and accumulators, WEEE, used tyres and ELVs, the management of which is specifically outlined in dedicated legislative provisions.

Management

Disposal is still the predominant management option for non-hazardous industrial waste (80%). Recycling and use of waste as secondary material is increasing, but is still very low compared to other European Union (EU) member states

Of the generated hazardous industrial waste, about 37% is subject to recovery operations, whereas the 30% is stored pending recovery or disposal operations (R13/D15). The rest is landfilled or undergoes other disposal activities

Management is generally characterized by lack of adequate infrastructure network, while there are no concrete synergies among industrial sectors to make use of and derive benefit from recycling and recovery options



Significant margins for progress still exist for

- data collection and registration system for IW generation & management
- inspection and enforcement procedures

Stream-specific national strategy: Industrial Waste

- ✓ <u>Re-use and recovery are prioritized</u> if industrial waste cannot be directly used in production processes, without entering the waste management system
- ✓ <u>Reinforcement of synergies among industrial sectors</u> aiming at industrial symbiosis
- ✓ <u>Forbidding the mix of hazardous waste</u> with non-hazardous industrial waste



Stream-specific national objectives: Industrial Waste

- Ensure traceability of industrial waste at all stages from generation to final recovery/ disposal
- Ensure rational management of industrial waste along the lines of the waste hierarchy and taking into account sector-specific best available techniques
- Development of an electronic platform for promoting synergies among industries
- Establishment of adequate national network of installations for the disposal of industrial waste
- Implementation of systematic research in order to upgrade industrial waste management methods and documentation of the best available management option from the operators of the industrial facilities



Infrastructure networks for industrial waste recovery

- the <u>full utilisation of existing infrastructure</u> available from the industrial and construction sectors to recover non hazardous inorganic waste
- the development of <u>synergies among industrial sectors</u>, including the waste management sector, especially in regards to recycling and recovery of non-hazardous organic residues
- the production of <u>secondary materials and fuel</u> from industrial waste
- the <u>maximisation of recovery options</u>, such as backfilling and land treatment which results in agricultural or ecological benefit



Infrastructure networks for industrial waste disposal

- private waste disposal facilities to serve own needs for those producers which have to dispose of more than 50 thousand tonnes annually
- landfills for non-hazardous industrial waste; co-disposal with MSW for similar types of industrial waste, where feasible; co-siting with MSW landfills where possible
- separate landfills for non-hazardous inorganic industrial waste; cositing with inert waste landfills, where possible
- utilization of existing hazardous waste landfills to cover the current and short-term needs for hazardous waste disposal
- at least one landfill for hazardous industrial waste
- exploration of co-disposal possibilities and sea transport arrangements to cover the needs of the islands
- utilization of the existing industrial installations for the (co)incineration of organic industrial waste that cannot be recovered



Organisational and other measures

- An electronic platform for promoting synergies among industrial sectors to maximise recovery operations
- Voluntary industrial waste management plans drawn up by operators of industrial facilities
- Organisation and supervision of waste management within officially designated industrial areas
- Inspection programme and rationalisation of management for historically accumulated industrial waste
- Development of standards for the use of inorganic wastes of industrial origin as secondary materials
- Preparation of guidance documents on the interpretation and implementation of the European List of Waste (Commission Decision 2000/532/EC, as amended) from the Greek competent authorities and other actors involved in the generation and management of industrial waste
- Procedural arrangements for the definition of by-products and end-of-waste status
- Awareness and education programmes and campaigns for industrial waste





Industrial Waste Strategy for Greece

Thank you for your attention!

Despina Kallidromitou

Email: kallidromitou@epsilon.gr,

T: +30 210 6898622 F: +30 210 6842420