

USING INFORMATION TECHNOLOGIES IN RECYCLING IN RECYCLING ELECTRICAL AND ELECTRONIC EQUIPMENT

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INTRODUCTION

- Concept of industry 4.0 is the name for future innovations and transformations in production processes.
- Concept has created new challenges for industrial company such as digitalization and automation.
- Base is interconnection of work units to an integrated, fully automated and optimized production processes.
- One of the possibilities of industrial innovation is using information system of recycling **electrical waste**.

ELECTRICAL WASTE

- The obligation to recycle electronics in the Czech Republic has been in since 2005.
- Composition of electrical waste:
 - *glass,*
 - *metal,*
 - *plastic,*
 - *other materials.*



LEGAL FRAMEWORK THE ELECTRICAL WASTE

- Directive 2012/19/EU about waste electrical and electronic equipment.
- Directive 2011/65/EU about the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- Directive 2009/125/EC that defining eco-design requirements and energy performance.
- Directive 2008/98/EC about waste.



- Waste legislation places high demands.
- We expect further development of environmental legislation in the future.
- Manufacturers and importers must to keep records of all electrical products.
- Companies either fulfil this obligation:
 - *Individually information recycling system,*
 - *Collective information recycling system.*
- Company chooses a recycling system.

INDIVIDUAL INFORMATION RECYCLING SYSTEM

1. Registration request.
2. Keep records on the market of these electrical and electronic equipment.
3. Keep records of recycled electrical and electronic equipment.
4. Prepare a final report to „*Integrated Enviromental Reporting System*“.



- ✓ Control over recycling.
- ✓ Ecological use of ecological design.

- X Demanding administration.
- X Complicated process.

COLLECTIVE INFORMATION RECYCLING SYSTEM

➤ Collective system that provides :

- collection,
- processing,
- commercialization ,
- professional disposal,
- administration,
- communication.

➤ In the Czech Republic there are 15 companies that provide a collective recycling system.



ASEKOL COLLECTIVE INFORMATION RECYCLING SYSTEM

- The biggest company in the CR that provides return and recycling of electrical equipment.
- Established in 2005.
- Based on a contractual relationship, it provides nationwide:
 - *take-back of electrical equipment,*
 - *transportation,*
 - *recycling,*
 - *reporting to Integrated Enviromental Reporting System,*
 - *compliance directive 2012/19/EU about waste electrical and electronic equipment.*

ENTERING INFORMATIONS TO ASEKOL COLLECTIVE INFORMATION RECYCLING SYSTEM

- To internet browser filling the record for electro equipment.
- Registration pieces and kilograms.
- Frequency is quarterly.



GROUPS OF ELECTRICAL WASTE IN ASEKOL COLLECTIVE INFORMATION RECYCLING SYSTEM

- 1) Temperature exchange equipment.
- 2) Screens, monitors.
- 3) Lamps.
- 4) Large equipment.
- 5) Small equipment.
- 6) Small IT and telecommunication equipment.



RECYCLING FEE CALCULATION OF ELECTRICAL WASTE IN ASEKOL

- The Asekol system generates:
 - summary of reported groups electrical waste,
 - amount of recycling fees,
 - fixed system fee for participation.
- The tariff is accessible to all members of asekol system.
- Asekol system submits data for inspection and statistical processing.

COLLECTION NETWORK AND COLLECTED ELECTRICAL WASTE IN ASEKOL

- Asekol has a dense network of collection points for the collection of electrical waste.



Year	Collected amount of electrical waste [t]	Number of collection points	Number of placed red containers for electrical waste [pc]	Electrical equipment take-back per capita [kg]	Electrical equipment take-back from the amount put on the market [%]
2006	5 792	2 171	-	0,56	15
2007	9 182	4 053	-	0,9	25
2008	12 928	6 019	-	1,24	35
2009	17 186	10 641	-	1,65	40
2010	16 558	11 152	-	1,57	64
2011	17 657	13 122	-	1,67	47,6
2012	17 139	15 087	-	2,39	54,96
2013	15 692	15 935	1 987	1,49	-
2014	16 981	16 800	2 109	1,62	-
2015	17 743	17 053	2 252	-	50
2016	19 554	16 098	2 821	-	69
2017	19 185	16 687	3 377	-	62
2018	18 640	17 157	3 594	-	59



- ✓ Cost reduction.
- ✓ Well arranged and simply system.
- ✓ Less administration.

- X Registration required.
- X Fixed fee for participation in system.

CONCLUSION

- Asekol information recycling system facilitates the whole process of waste management for companies.

Thank you for your attention!

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