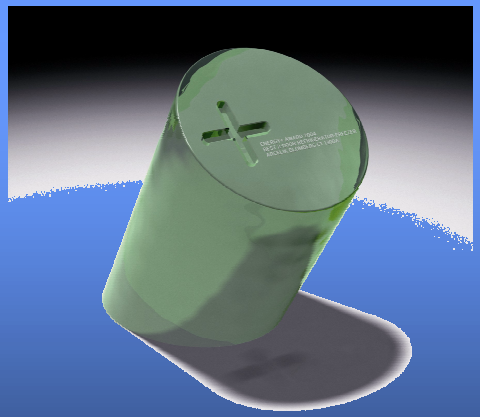
Energy Efficiency in Household Appliances



-Turkey-

PRODUCTS

Major Household Appliances

- Freezers
- Refrigerator
- Washers
- Dryers
- Dishwashers
- Ovens
- Mini- Midi Ovens
- Cook tops

Small Household Appliances

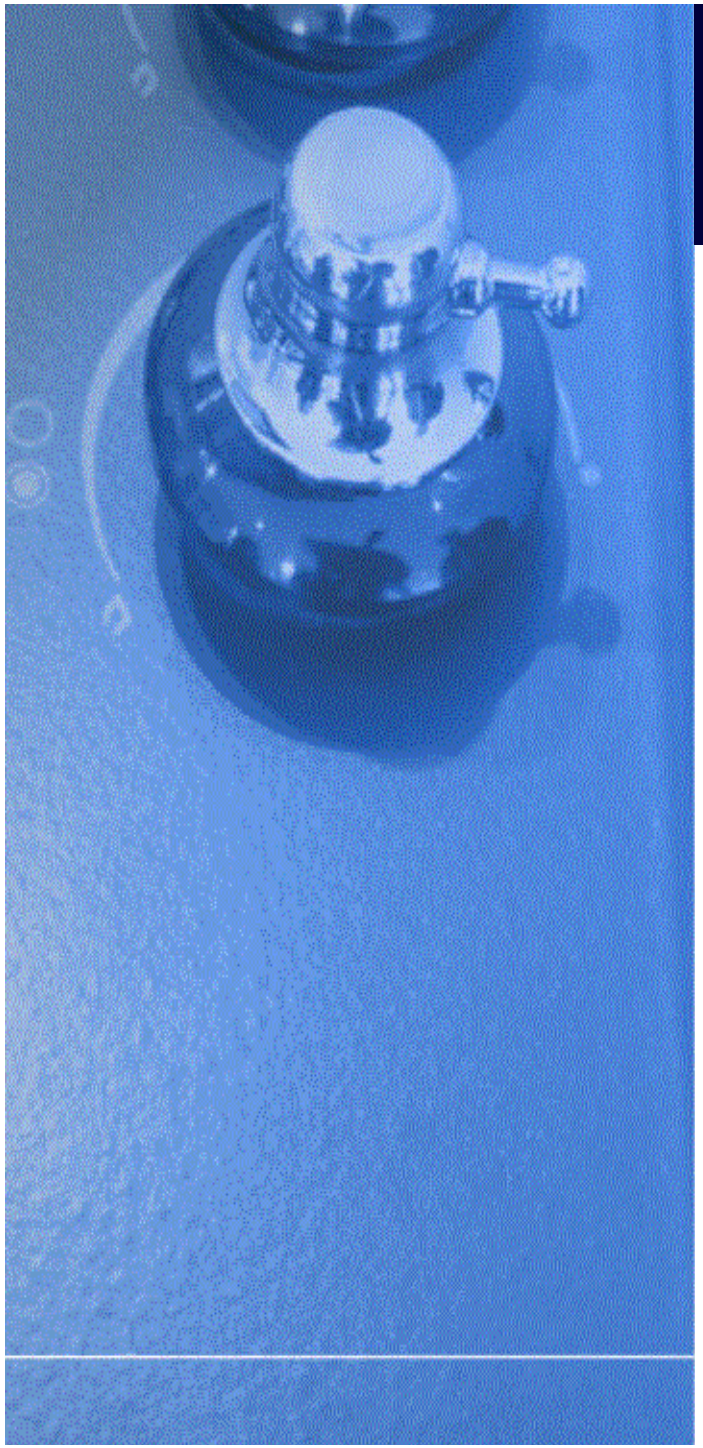
- Vacuum Cleaners
- Electric Kitchen Appliances
- Irons
- Fans
- Personal Care Appliances

Built-in

- Refrigerators
- Dishwashers
- Ovens
- Cookers
- Cooker Hoods

Heating – Ventilation – Air Cond.

- Air Conditioners
- Water Heaters
- Heating appliances



History

First steps

- **‘59: First washing machine production**
- **‘60: First refrigerator production**

‘1980s

- **Production with licence**
- **Development of the suppliers industry**
- **Establishment of the quality systems**

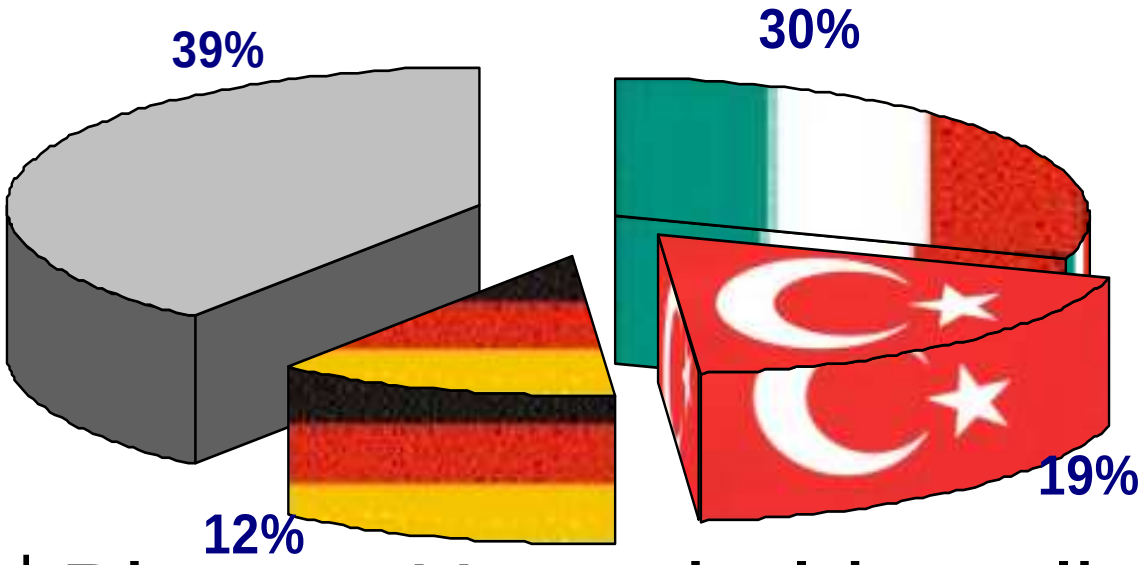
‘1990s

- **Investments of R&D**
- **National technology, national design solutions**

‘2000s

- **Modern production plants**
- **Optimum capacities**
- **Modern technology**
- **Increasing rate of productivity**
- **Export success**

Household Appliance Industry

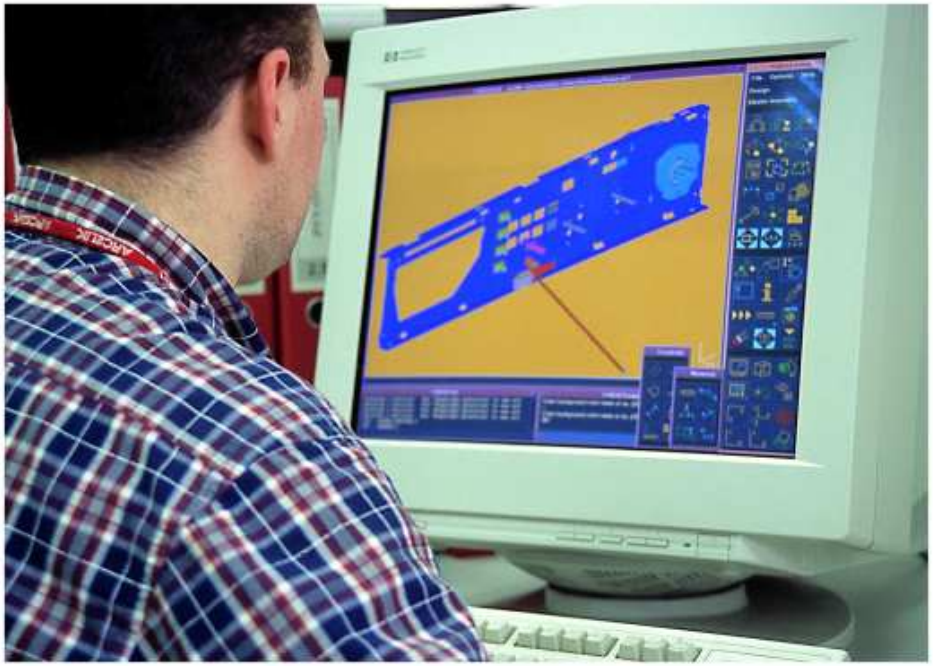


2nd Biggest Household appliance Producer in Europe!

Source:**4 Main product Appliance November 06; Statistical Portrait of Europe**

Production Capacity

White Goods
24 million units



White Goods Production Facilities in Turkey

arçelik

CANDY

DemirDöküm

INDESIT

VESTEL

B/S/H/

Production Facilities of Turkish Industry

Major Brands

Turkish brands used in export markets

BEKO

Blomberg

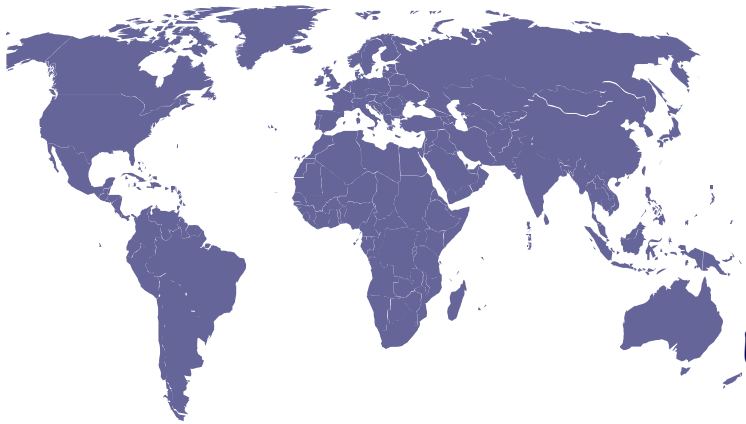
elektrabregenz

arctic

LEISURE

FLAVEL

arçelik



OEM production for global brands

LG

Amica

Brandt

Whirlpool

Daewoo

Electrolux

Export Datas – 2005 / 2006

PRODUCT	VALUE (USD)	2006 / 2005 %
Refrigerators	808.000.000	% 23
Washing m.	622.200.000	% 23
Diswashers	119.000.000	% 65
Ovens	332.840.000	% 29
Heating and Ventilation	110.000.000	% 94

Total Export Values of the White Goods : 2 billion USD

Contribution to the national economy

Domestic market

White goods: 4 Billion $

Export

White Goods: 2 Billion $

6 BILLION $

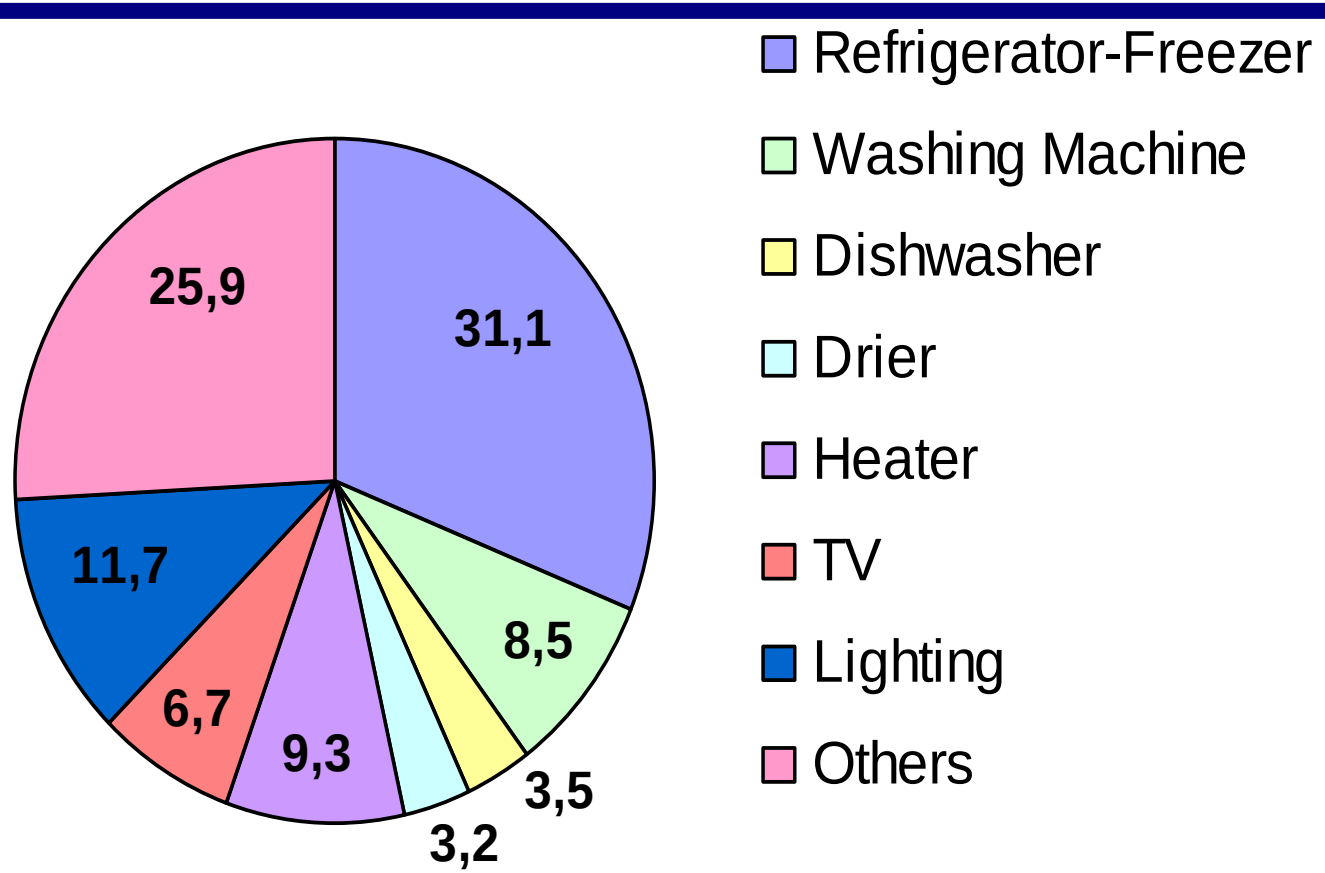
Turkish durable goods industry employs 400.000 people

Production, sales, export - 2006 (units)

PRODUCT	Production	Domestic	Export
Refrigerators	6.750.000	2.100.000	4.800.000
Washing m.	5.280.000	1.780.000	3.500.000
Dishwashers	1.180.000	850.000	570.000
Ovens	2.200.000	730.000	1.460.000
Air Conditioners	1.250.000	850.000	400.000
Total White Goods	16.660.000	6.300.000	10.730.000

- Energy efficiency begins at home… with efficient appliances

HOUSEHOLD ELECTRICITY CONSUMPTION IN TURKEY



Development on Household Appliances

In the last decade, a coherent development of European energy labels and the implementation of industry voluntary agreements produced outstanding progress towards higher-efficient and better eco-friendly appliances, significantly improving features and performances.

Today, the energy efficiency of many types of large appliances is close to the technological limit.

Last decade main activities in the energy field

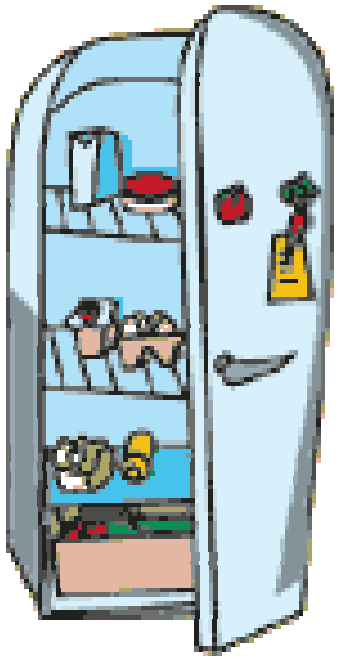
	94	95	96	97	98	99	00	01	02	03	04	05
Energy labels		Cooling appliances								A+		
			Washing machines									
			Dishwashers									
			Driers									
								Electric ovens				
								Room airco				
Directives				En.Eff. fridges/freezers								
Unilateral commitments				Washing machines							2nd	
						Dishwashers						
						Storage water heaters						
											Cold	

Energy Labelling

Energy class :BestA++

Energy Consumtion:kWh

Other information: volume, noise etc.



Energy

Manufacturer
Model

Logo
ABC
123

More efficient

A
B
C
D
E
F
G

Less efficient

A

Energy consumption kWh/year
(Based on standard test results for 24h)

350

Actual consumption will depend on how the appliance is used and where it is located

Fresh food volume l — 200
Frozen food volume l — 80

****

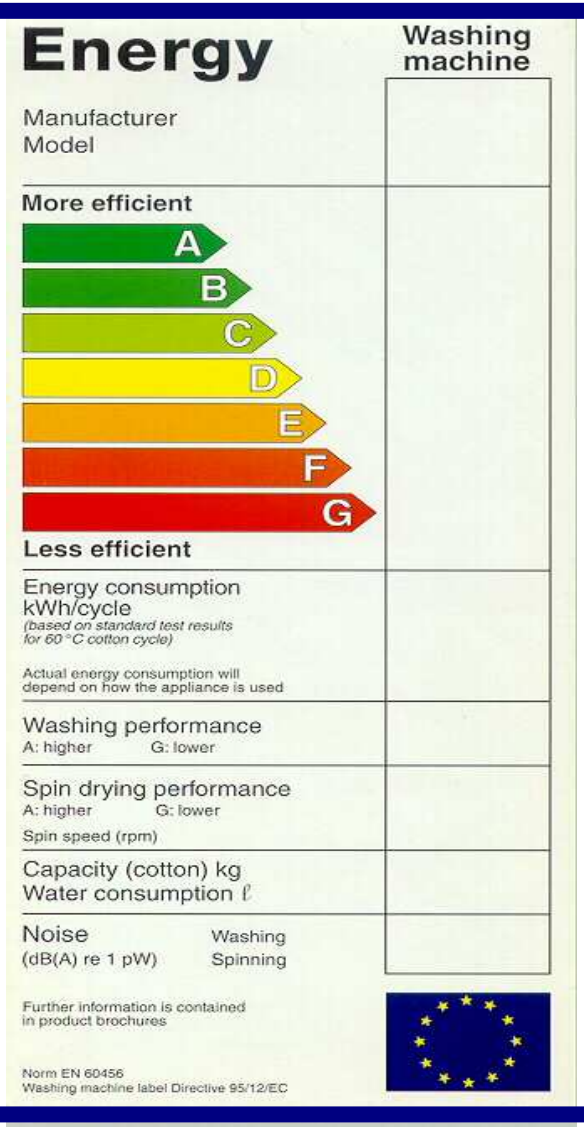
Noise
(dB(A)re 1 pW)

40

Further information is contained in product brochures

Norm EN 153 May 1990
Refrigerator Label Directive 94/2/EC

Energy label drives competition and innovation



Labelling was introduced in the 2nd half of the 1990s

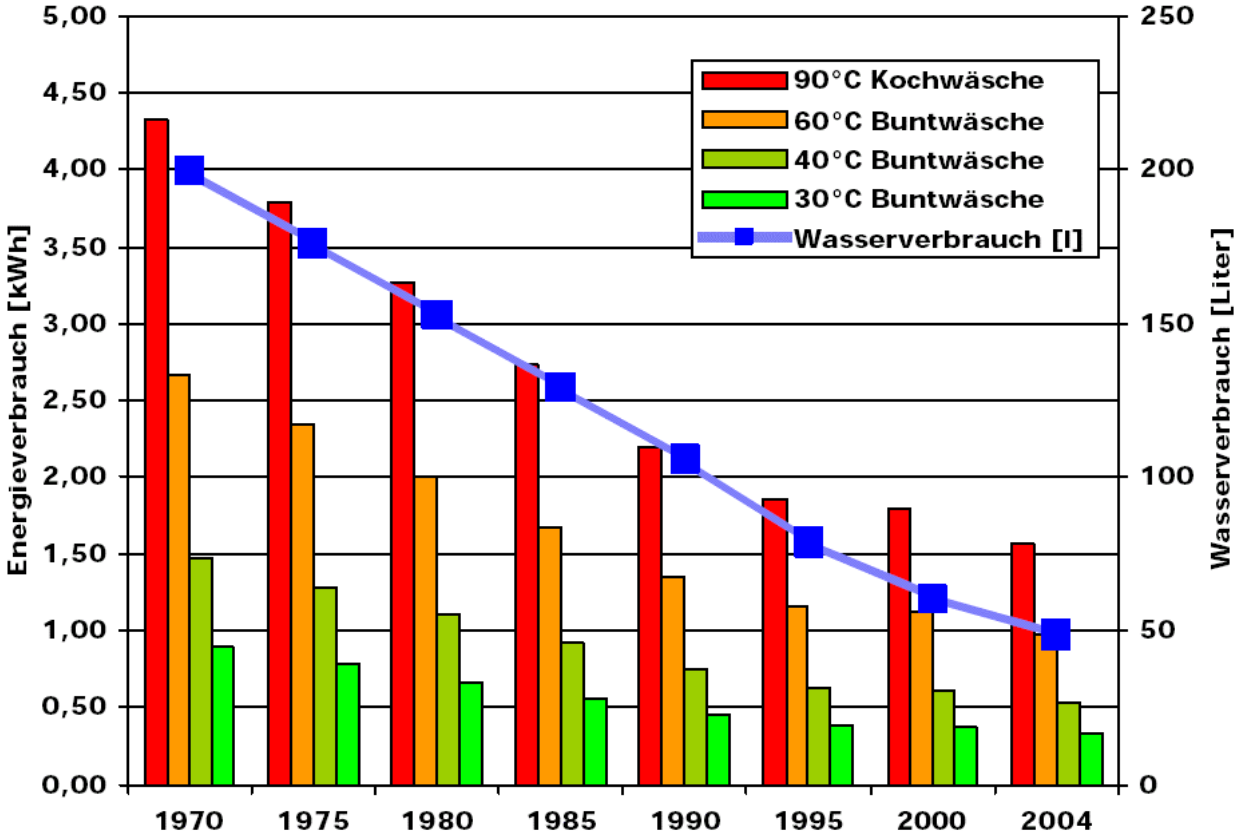
92/75/EEC – Indication by Labeling and Standard Product Information of the Consumption of Energy and Other Resources of Household Appliances"

- 94/2/EC – energy labeling of refrigerators, freezers & comb.
- 2003/66/EC – adopted directive 94/2/EC (A+, A++)
- 2002/40/EC – energy labeling of household electric ovens
- 97/17/EC – energy labeling of household dishwashers
- 95/13/EC – energy labeling of household dryers
- 95/12/EC – energy labeling of household washing machines

Energy Labelling in Turkey

Directive	in EU	in Turkey
• 2002/40/EC Ovens	2003	2004
• 94/2/EC Refrigerators	2002	2002
• 95/12/EC Washing Machines	2002	2003
• 95/13/EC Tumble Driers	2002	2003
• 96/57/EC Refrigerators	2003	2005
• 96/60/EC Washer Driers	2002	2003
• 97/17/EC Dishwashers	2002	2003
• 2002/31/EC Air Conditioners	2006	2007

Improvement, Not just last one, Washing Machine

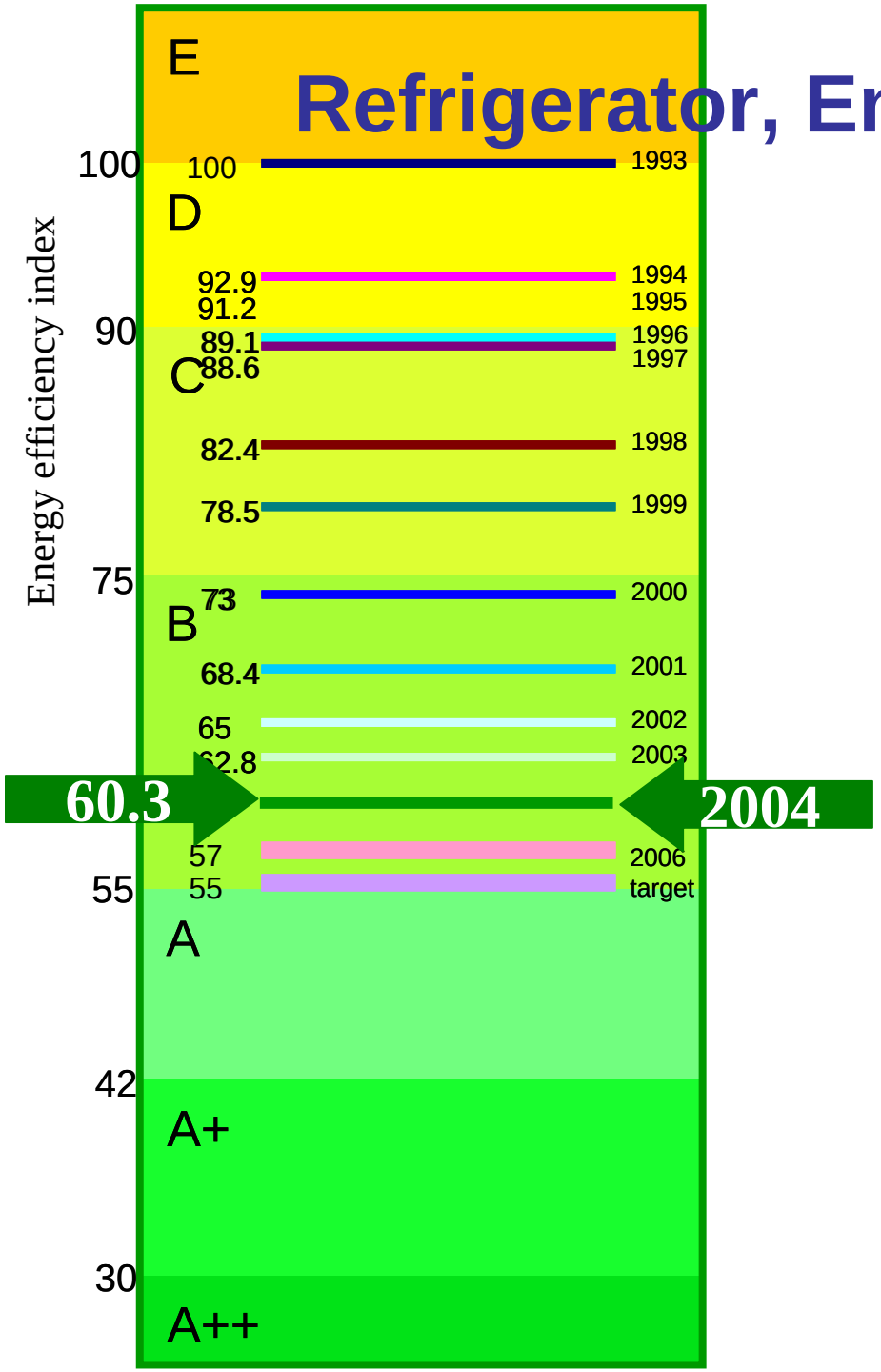


Washing machines: energy and water consumption.

Each generation of new models consumed less.

Source: Prof. Dr. Rainer Stamminger, Beitrag der Waschmaschine zum Nachhaltigen Waschen; http://www.haushaltstechnik.unbonn.de/waschtag/WaschtagPK_Vortrag_UniBonn.pdf

Refrigerator, Energy Efficiency



Today's average refrigerator consumes a mere 60% of what a 1993 model consumed.

On 1.1.2005 manufacturers voluntarily phased out 1,100 models out of a total 11,000 placed on the market.

Last decade energy efficiency improvements

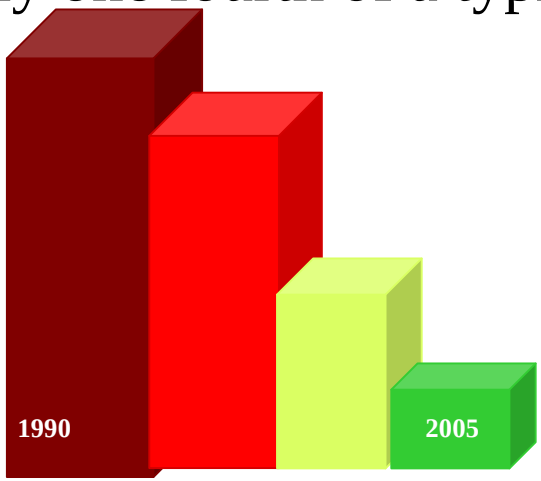
The average washing machine today consumes 44% less energy and 62% less water compared to the average machine of 1985.

Today's best refrigerator consumes only one fourth of a typical refrigerator from 1990.

Washing machines and dishwashers are close to the technological limit.

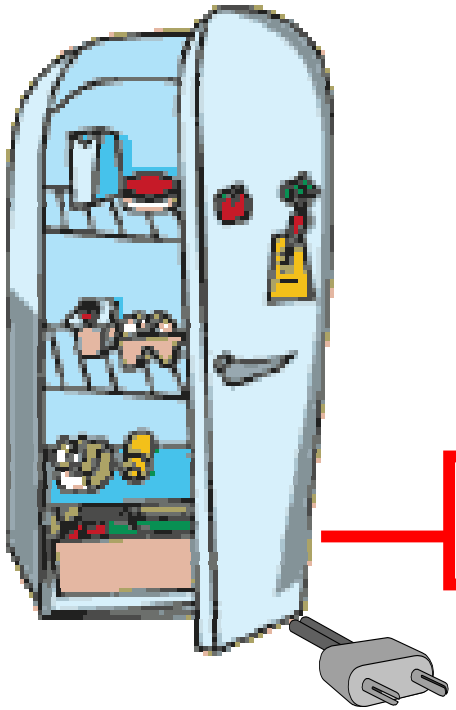
Refrigerators and freezers are close to the Least Life Cycle Cost.

- **This is the result of:**
  - –voluntary commitments
  - –energy labels
  - –competition



kWh/day	**1.8**	**1.5**	**0.9**	**0.5**
kWh/year	**670**	**550**	**330**	**165**
€/year	**100**	**82**	**46**	**25**

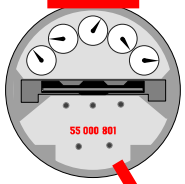
What is Least Life Cycle-Cost ?



500€

25-50-100?€/year

X Year



Life Cycle-Cost = Purchase+ Running

Price

Cost

Success story..

Total Electricity Production and Consumption in 2001, [GWh]

	World	USA	EU	Germany	Turkey	Argentina
Total Electricity Production	15,546,411	3,885,860	2,673,001	582.54	122.725	90.181
Total Final Consumption	12,699,164	3,342,219	2,297,693	501.669	95.316	76.195
Residential Consumption	-	1,156,673	669.703	139.094	23.557	21.911

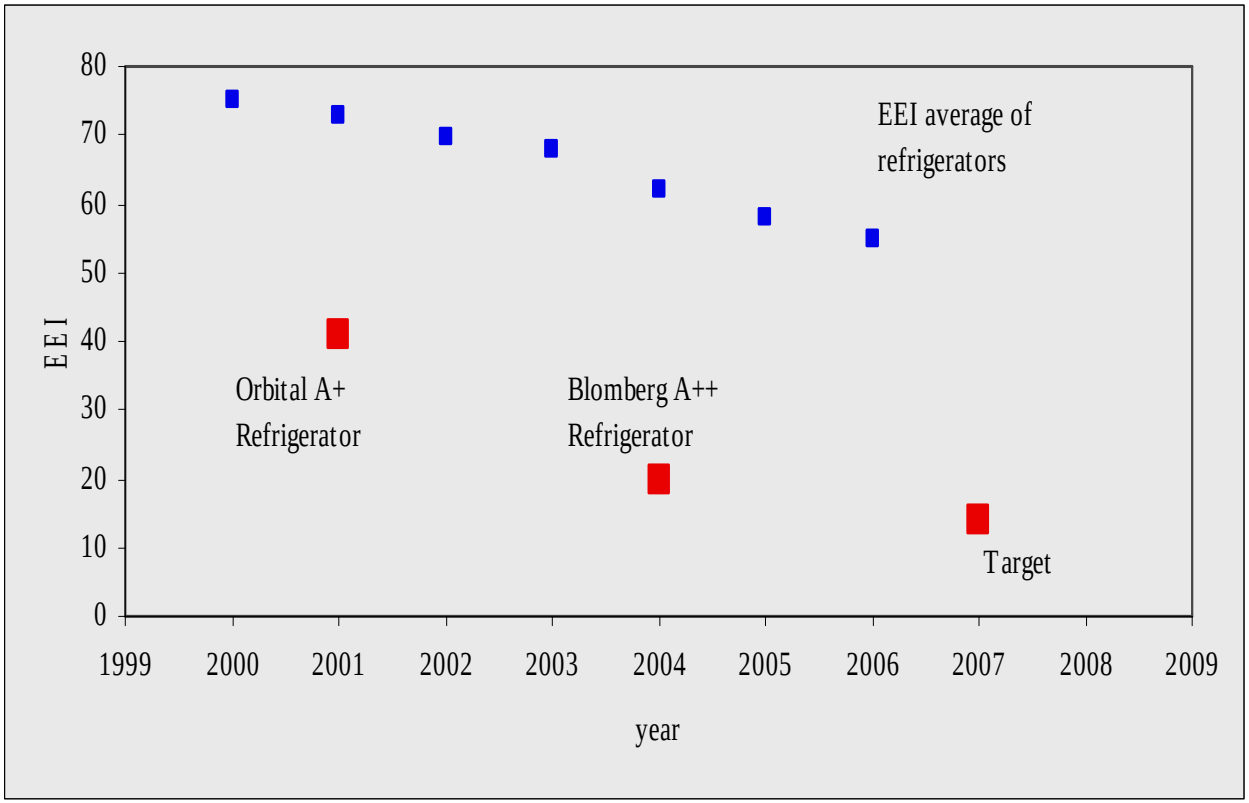
Source : http://www.iea.org (IEA Energy Statistics)

18,181,000 refrigerators were sold in Europe according to the CECED data in 2002, as total production in World was nearly 90 Million units.

If **every refrigerator** in the world would consume the same energy consumption of **Blomberg ''A++'' Refrigerator**, **the savings would be around 21,451 GWh**

PROGRESS in Energy Efficiency and Success

•Energy consumption of refrigerators has been reduced over time by the producer It continues to research on conventional refrigeration techniques, including reciprocating compressors, and alternate refrigeration technologies such as Stirling, thermoacoustic, and thermagnetic refrigeration.



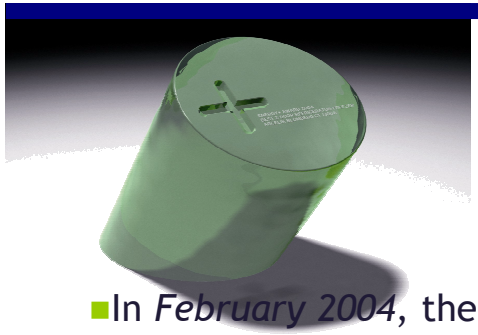
Success story..

Orbital Refrigerator and ‘’A++’’ Refrigerator’s contribution to the environment

	Refrigerator representing EU average *	Orbital A+ Refrigerator	Blomberg A++ Refrigerator
Net volume (Lt)	291	425	288
EEI	67,3	41,1	**19,8**
Label	B	A+	**A++**
Energy consumption of refrigerator(kWh/24 h)	1,028	0,92	0,375
Specific energy consumption of refrigerator	0,353	0,211	0,13

CECED (European Committee of Domestic Equipment Manufacturer) according to 2002 sales.

A++ "Most Efficient Energy+ Model" Refrigerator



Energy+, a project financed by 13 countries, mainly composed of the EU Members, organized the second European Energy+ Awards Competition in order to promote, recognize, and honor the most energy efficient refrigerators-freezers of participating manufacturers and most creative Energy+ campaigns by supporting organizations.

- In *February 2004*, the **European Commission** awarded **Blomberg** CT 1300A model refrigerator at the Energy+ Competition for being

"the most energy efficient refrigerator".

- It has an outstanding performance in conserving energy with 0.375 kWh/24h for 288 lt total net volume.
- **Blomberg** achieved to produce a refrigerator with 19.8 of EEI, **lowest ever attained in Europe,** by using VIPs, VCC, and highly optimized refrigeration circuit.
- According to the European labeling system **19.8 of EEI means better than label of A++.**

- **1st place : EEI =19.8**
- **2nd place : EEI = 26.9**
- **3rd place : EEI = 28.9**

Success story..

2007 Plus X Awards..

PLUS X AWARD®
achieved for:
Ecology

PLUS X AWARD®
achieved for:
Ecology

Energy level: A+
7 Kg in 30 minutes!!!
Less water consumption,
Less energy consumption,
With brushless motor, silence!

Some of the Awards

- The success of the sector is being awarded almost every year in different platforms.

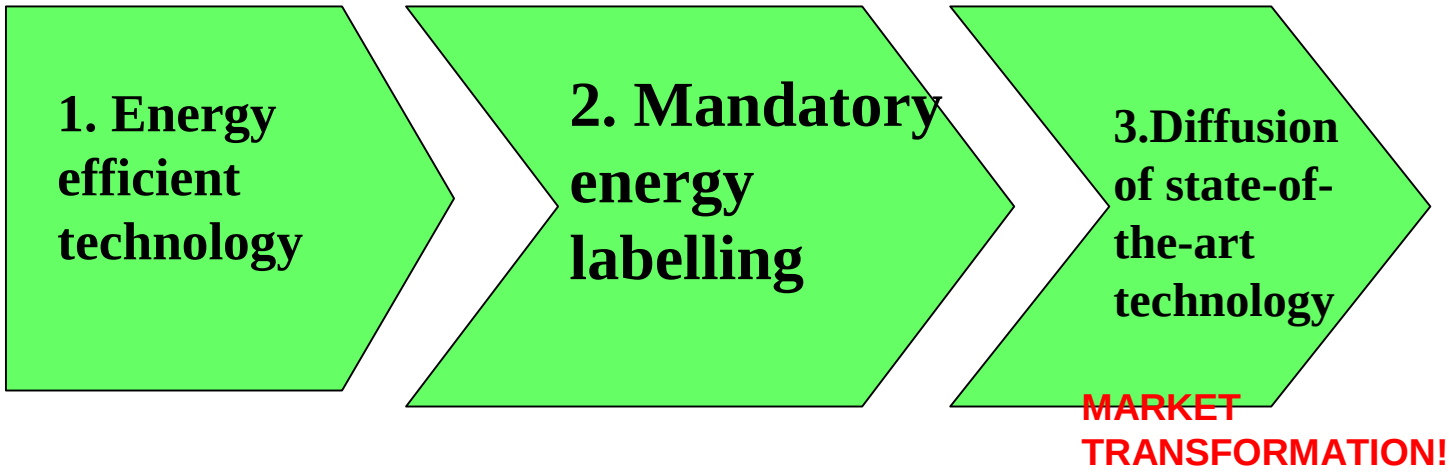
- Turkish industry produced and awarded for;
  - The most energy efficient refrigerator
  - The least water consuming dishwasher

- The production facilities are awarded with the TPM awards. ("Perfect factory award" of the Japanese State Institution JIPM's)

reddot design award

Policy for energy efficiency is not enough

In order to be successful, a policy for our sector must be based upon 3 elements:



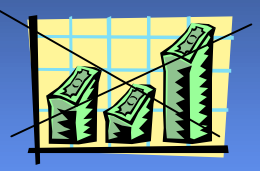
Energy efficiency vs. energy savings

•**Energy efficiency is not a synonym for energy savings.**

Real energy <u>savings</u> can only be achieved if energy-efficient <u>technology</u> is being put in place.

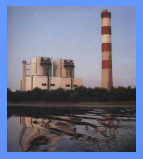
Conclusion

Result:WIN*WIN*WIN



Costumer:Less Energy Bill

Goverment:Saving at energy investment



Industry:More business in market (market transformation)

THANK YOU

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