



the Learning Network on Sustainable energy systems

# Ecodesign practices of whitegoods manufacturers



Net sales in billion USD

0.00 5.00 10.00 15.00 20.00 25.00 30.00 35.00 40.00 45.00 50.00



Samsung

46.31



Whirlpool

18.77



Electrolux

16.76



LG

15.92



BSH

13.96



Arçelik

5.85



Miele

4.37



Vestel

3.28



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the largest figure is for all consumer electronics, including home appliances, TV, printers, medical diagnostics





**Miele**



*AEG, Chef, Corberó, Dishlex, Dito Sama, ElektroHelios, Electrolux, Eureka, Faure, Frigidaire, Kelvinator, King, Molteni, Parkinson Cowan, Philco, Prosdócimo, REX, Rosenlew, Sanitaire, Simpson, Somela, Tornado, Tappan, Therma, Tricity Bendix, Volta, Wascator, White-Westinghouse, Zanussi, Zoppas*

*Acros, Admiral, Amana, Ariston, Bauknecht, Brastemp, Consul, Estate, Gladiator, Hefei Sanyo, Hotpoint, Indesit, Inglis, Jenn-Air, Kenmore, KitchenAid, Maytag, Polar, Privileg, Roper, Scholtès, Whirlpool*

**B/S/H/**

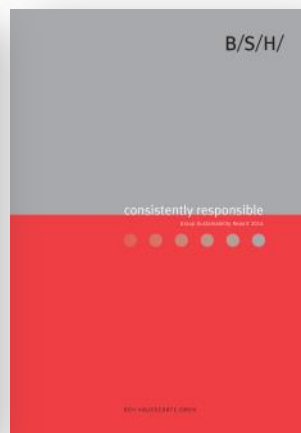
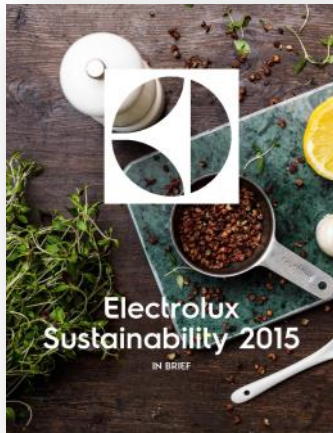
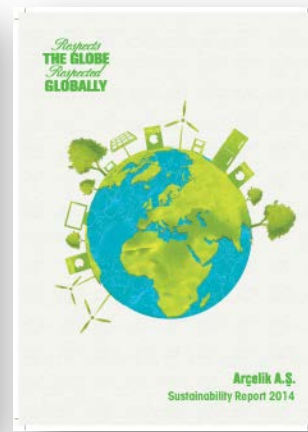
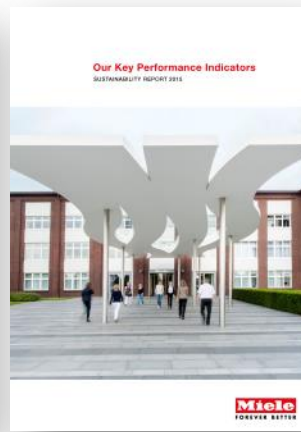
*Balay, Bosch, Coldex, Constructa, Gaggenau, Junker, Neff, Pitsos, Profilo, Siemens, Thermador, Ufesa, Viva, Zelmer*



*Altus, Arçelik, Arctic, Arstil, Beko, Blomberg, Defy, Elektrabregenz, Flavel, Grundig, Leisure*

**VESTEL**

*Atlantic, Electra, Finlux, Graetz, New Pol, Servis, Vestel, Vestfrost*



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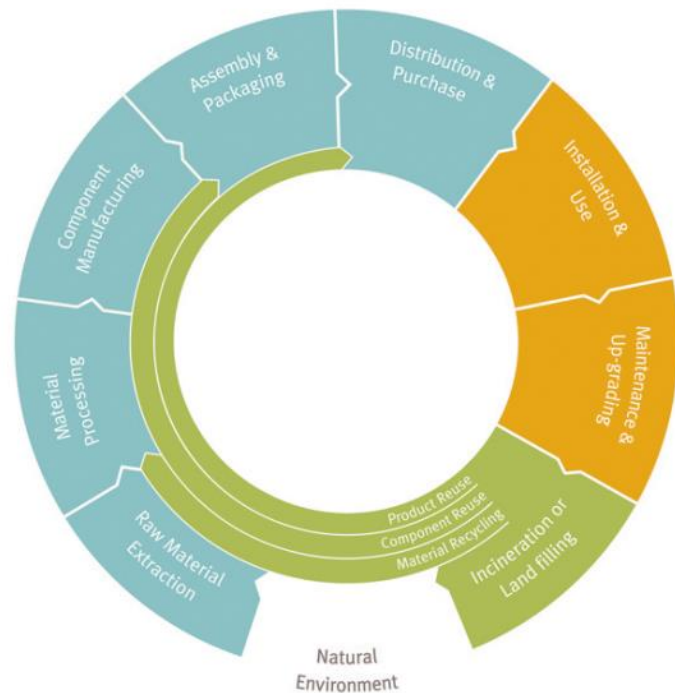


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# Okala

the ecodesign strategy wheel



©2012 Steve Belletire + Louise St Pierre + Philip White | The Okala EcoDesign Strategy Wheel.

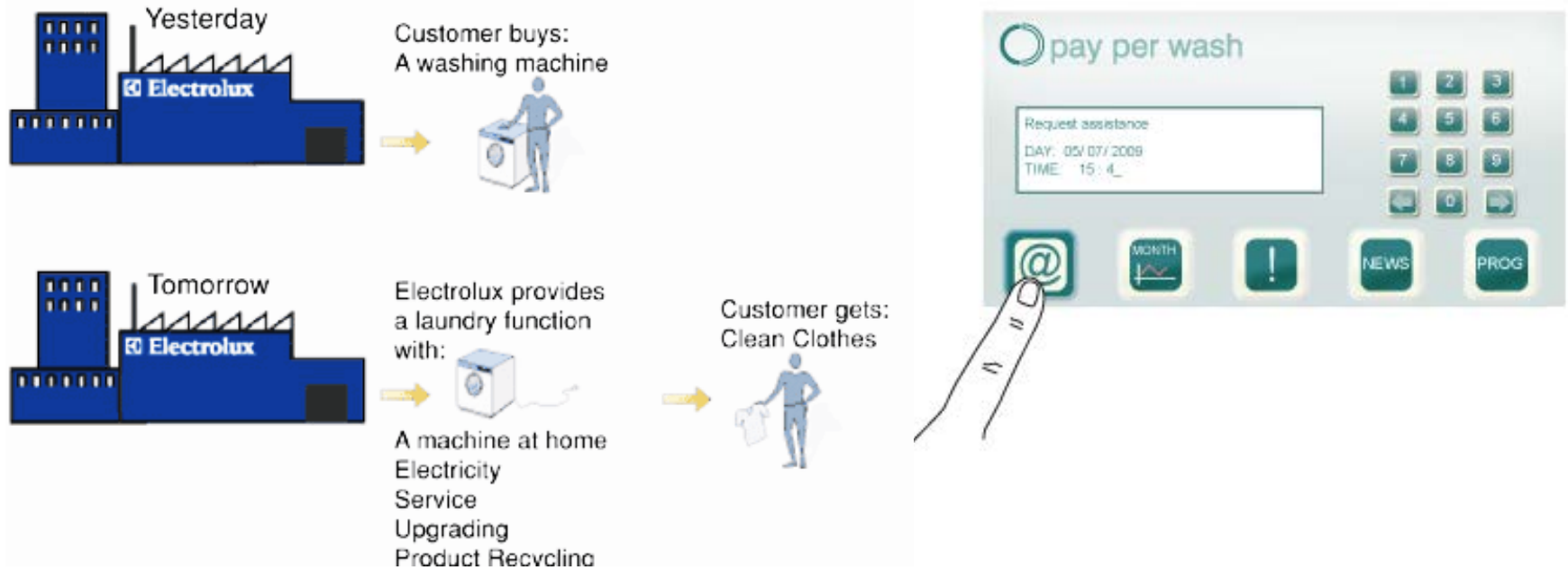


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	Samsung	LG	Whirlpool	Electrolux	BSH	Arcelik	Miele	Indesit	Vestel
<i>1 Innovation</i>									
1.1 rethink how to provide the benefit									
1.2 design flexibility for technological change									
1.3 provide product as service									
1.4 serve needs provided by associated products									
1.5 shares among multiple users									
1.6 mimic biological systems									
1.7 use living organisms in product system									
1.8 create opportunity for local supply chain									
<i>2 Reduced material impacts</i>									
2.9 avoid materials damaging human or ecological health									
2.10 avoid materials that deplete natural resources									
2.11 minimize quantity of material									
2.12 use recycled or reclaimed materials									
2.13 use renewable resources									
2.14 use materials from reliable certifiers									
2.15 use waste by-products									
<i>3 Manufacturing innovation</i>									
3.16 minimize manufacturing waste									
3.17 design for production quality control									



©1999 AB Electrolux. 7,000 pay-per-wash washing machines trials in Gotland Island Sweden.



# Miele

1  
Radical  
innovation



© 2015 Miele & Cie KG | 6000 Series



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2016 Miele WT1

2016 LG TurboWash



**arçelik**  
**beko**



©2011 Whirlpool Latin America | Brastemp Geladeira com 'Smart Door'

1  
Radical  
innovation



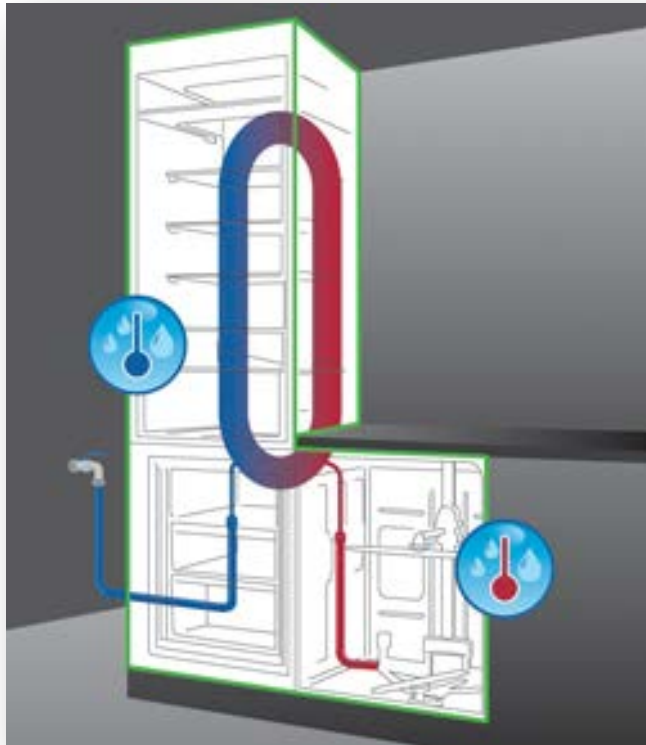
©2015 LG Electronics | Door-in-Door™ Refrigerator



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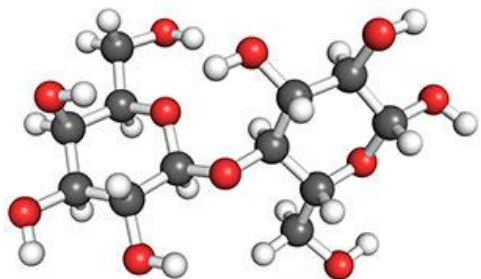
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©2012 Whirlpool Corporation | Bauknecht | Green Kitchen ecosystem



©2015 BSH Hausgeräte GmbH | Bosch Series 8 ActiveOxygen™ Washer | Siemens iQ700 SensoFresh



### Blowing Agent Comparison Honeywell Solstice™: Environmentally Differentiated

Molecule	ODP	Improvement vs. CFC-11	GWP <sub>100</sub>	Improvement vs. CFC-11
CFC-11	1.0	0%	4,750	0%
HCFC-141b	0.11	89.0%	725	84.7%
HCFC-142b	0.065	93.5%	2,310	51.4%
HCFC-22	0.055	94.5%	1,810	61.9%
HFC-134a	~0	~100.0%	1,430	69.9%
HFC-245fa	~0	~100.0%	1,030	78.3%
<b>Solstice Gas Blowing Agent</b>	<b>~0</b>	<b>~100.0%</b>	<b>&lt;1</b>	<b>99.9%</b>
<b>Solstice Liquid Blowing Agent</b>	<b>~0</b>	<b>~100.0%</b>	<b>1</b>	<b>99.9%</b>

2  
Less material impacts



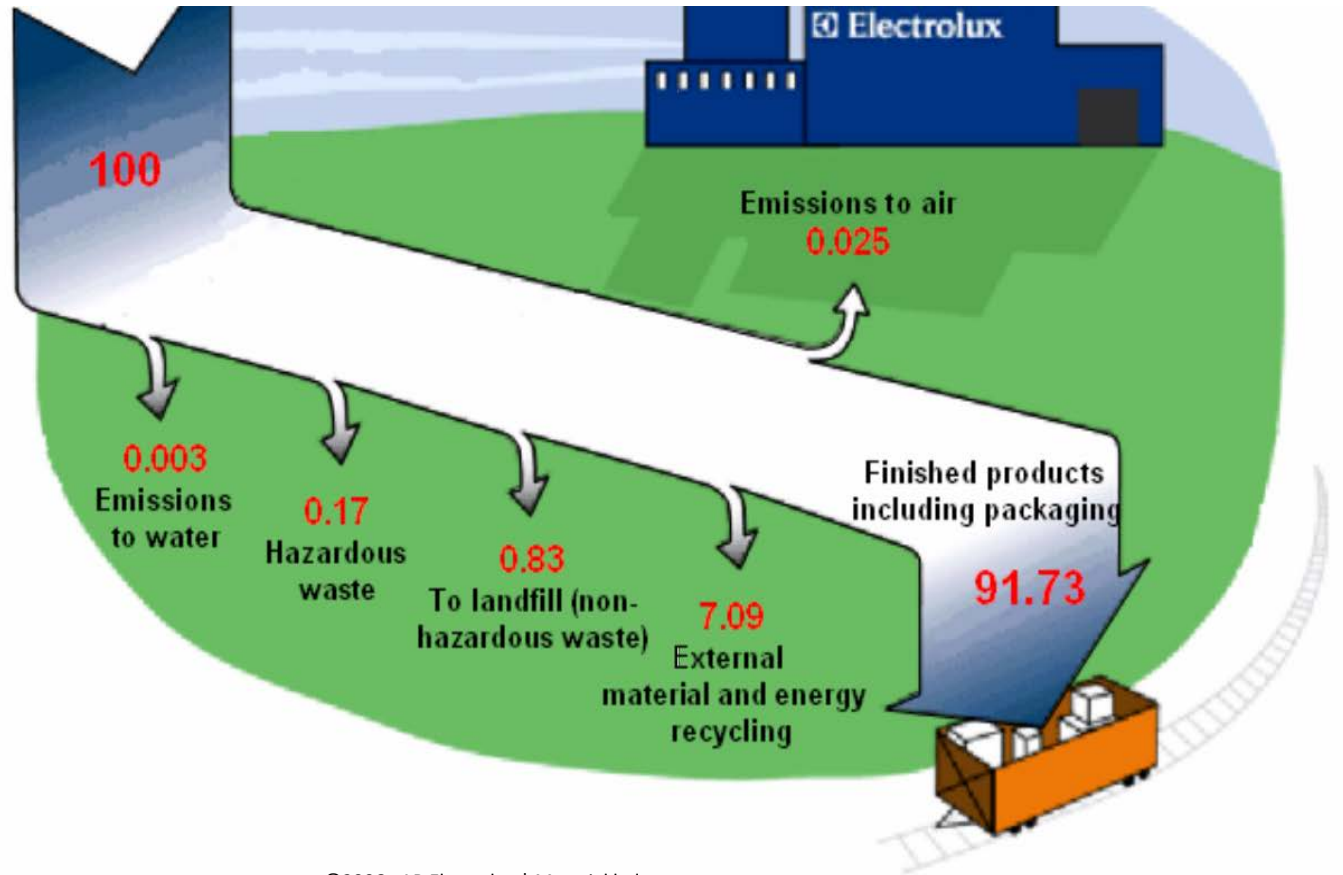
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©2011. AB Electrolux | 'Ecologic' washer with Braskem I'm green™ Polyethylene



©2006 . AB Electrolux | Material balance



# SAMSUNG



Microwave oven



Dishwasher



Refrigerator



**AFTER**  
44% less weight  
70% less pulp  
Recyclable

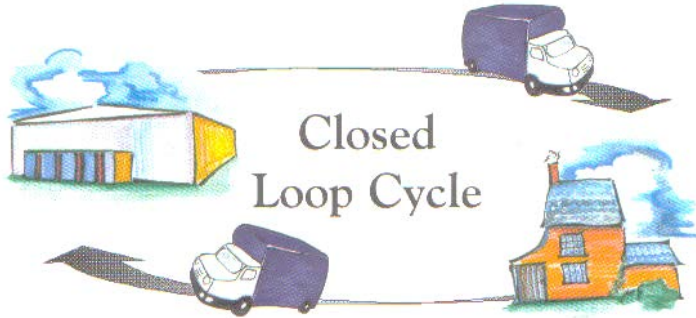
**BEFORE**

4  
↓ Distribution impacts

©2010 Samsung Electronics | Shrink-wrap packaging



©2013 Samsung Electronics | Returnable-Reusable refrigerator shipping packages | Expanded polypropylene



4  
↓ Distribution  
impacts

©2000 AB Electrolux + SCA Tuscarora | Returnable-reusable packaging system trial for cooker ranges with direct home delivery service | Expanded polystyrene



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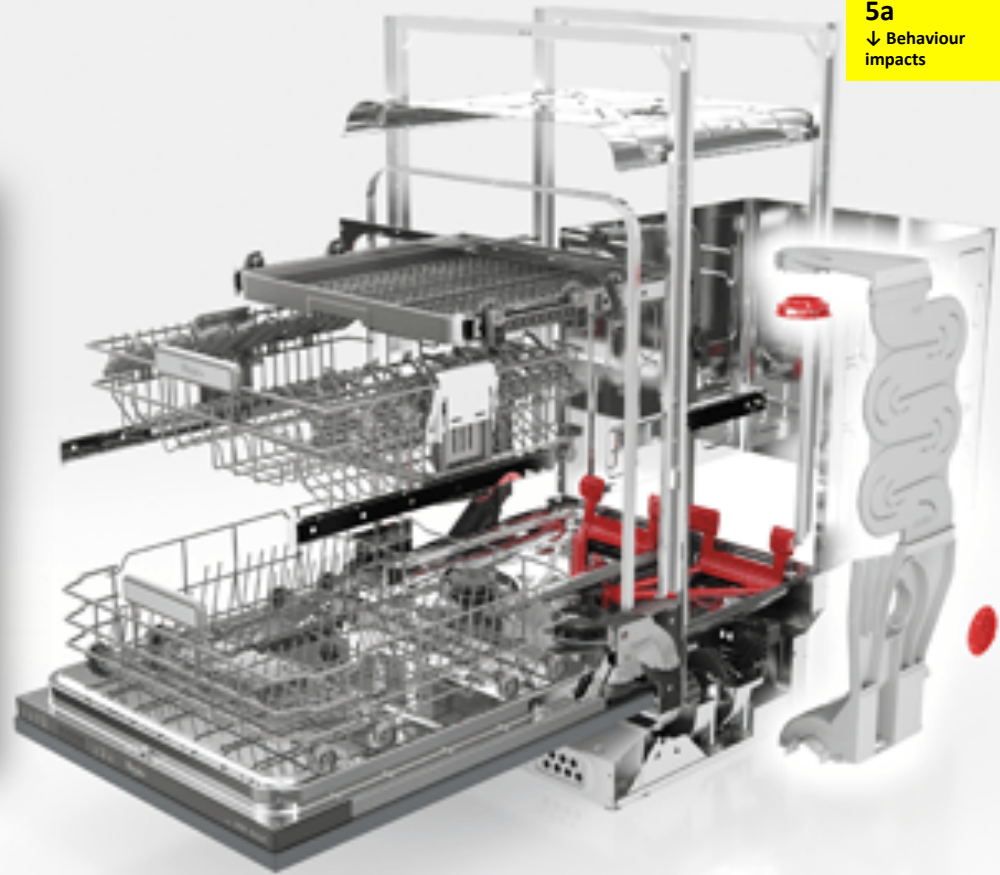


©2011 Whirlpool Consul Lavadora Facilite | Reutilizar Água

©2012 Samsung Top Loader with Aqua Preserve



©2013 KitchenAid AquaSense Recycling System for dishwashers



©2012 Whirlpool 6<sup>th</sup> Sense PowerClean



©2012 Miele & Cie KG | Washing machine with Eco Feedback

# B/S/H/



## Dishwasher Tips

Bosch Home Appliances USA • 6 videos • 39,959 views • Last updated

Stephanie at Bosch home appliances offers her tips for making the most of your dishwasher, including how to load and where to place large items.

▶ Play all

◀ Share

+ Save

1



### How To Load A Dishwasher: Bosch Dishwasher Tip #1

by Bosch Home Appliances USA

2



### Do I Need to Pre Rinse Before Loading a Dishwasher: Bosch Dishwasher Tip #5

by Bosch Home Appliances USA

3



### Loading Wine Glasses and Glassware in a Dishwasher: Bosch Dishwasher Tip #3

by Bosch Home Appliances USA

4



### Plasticware in the Dishwasher: Bosch Dishwasher Tip #4

by Bosch Home Appliances USA

©2009 BSH Home Appliances Corporation | How-to videos

5a

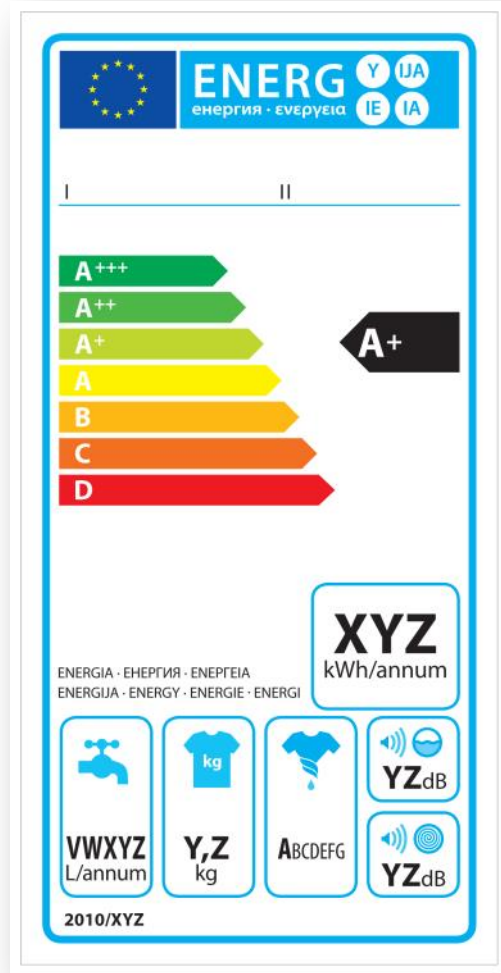
↓ Behaviour impacts



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EU Energy Label	Clothes washer	Clothes dryer	Dish washer	Fridge	Oven
Samsung	A+++	A++	A++	A+++	A+
LG	A+++	A+++	A+++	A+++	
Whirlpool	A+++	A++	A+++	A++	A+
Electrolux	A+++	A++	A+++	A++	A+
BSH	A+++	A+++	A+++	A+++	A+
Arçelik	A+++	A++	A+++	A+++	A
Miele	A+++	A+++	A+++	A+++	A+
Indesit	A+++	A+	A+	A++	A
Vestel	A+++	A	A+++	A+++	A++

©1992 European Union Directive 92/75/EC | Energy consumption labelling scheme.

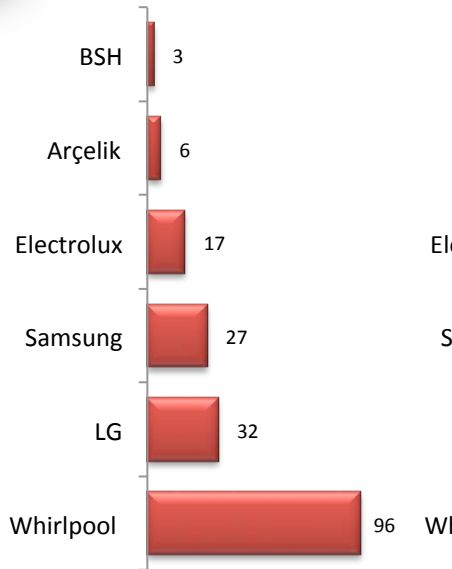




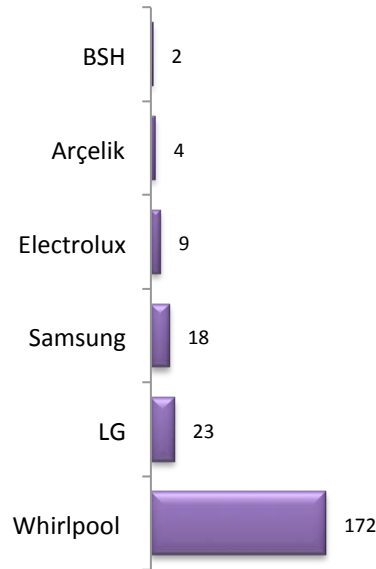
**5b**  
 Less use  
 impacts



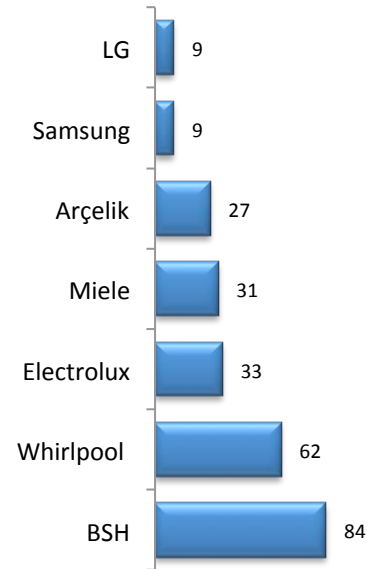
### Clotheswashers



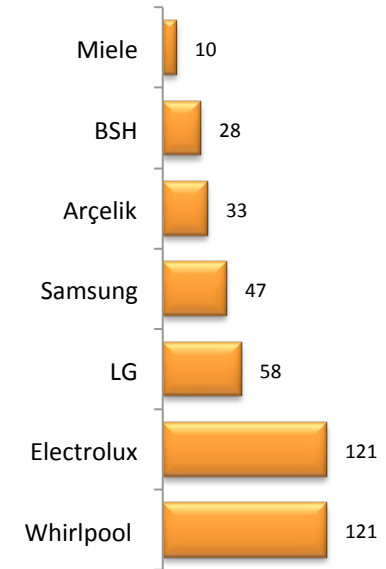
### Clothes dryers



### Dish washers



### Refrigerators



©1992 Environmental Protection Agency + US Department of Energy | Energy Star for energy-efficient consumer appliances





5b  
Less use  
impacts



Power Cut  
**EverCool**™

UP TO  
**9 Hours**  
REFRIGERATOR SECTION\*



## INSULATED CAPILLARY TECHNOLOGY



**12 HOUR\***  
COOLING RETENTION  
DURING POWER CUTS



**FASTEST**  
IN ICE MAKING



**-26°C**  
COLDEST  
FREEZER

©2015 Whirlpool India | Icemagic Powercool

©2013 LG Electronics | Power Cut Ever Cool



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# Electrolux Green Range

Efficiency without compromise.



**Dow Jones Sustainability Indexes**  
 Member 2012

Global sector leader in sustainable household appliances.



## Cooking on Induction means no residual heat loss



## Greener with Induction cooking



### Top tips:

- ✓ Cooking on induction uses less energy than gas, so it's all of the energy is transferred to the food and lower running costs.
- ✓ Using an induction hob, results in a more efficient kitchen.

## Our Green Range

Approximately 75% of the total environmental impact of an appliance during its life cycle is generated while it is being used. So our appliances use less energy than ever before to reduce this impact. Here are some features from our green range that make them efficient in everyday use.

- 
**SteamSystem Washing Machine**  
 Our washing machines with EcoTrio function give feedback on energy consumption, whilst Weight Sensor adapts water consumption and detergent according to the load - minimising energy, water and detergent without compromising results.
- 
**EcoCare Heat Pump Dryer**  
 Our dryers have the best A Class energy rating, thanks to Heat Pump technology and features like Weight Sensor which automatically select the cycle time and energy required according to the load.
- 
**ReelLife® Dishwasher**  
 ReelLife® dishwashers save energy with features like AutoOff which eliminates standby electricity consumption and AutoFlex which automatically selects the best temperature and washing time according to the load and dirt level.



## B/S/H/

### Our Super Efficiency Portfolio 2011

Pioneering technology that protects the environment



BSH BOSCH UND SIEMENS HAUSGERÄTE GMBH

pre-heating times and achieves shorter cooking times at lower temperatures.



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## AIRWash



Powerful Air from fan



Hot coils heats up air



Hot air penetrates odour particles



Cold water and hot air separate, removing odour particles

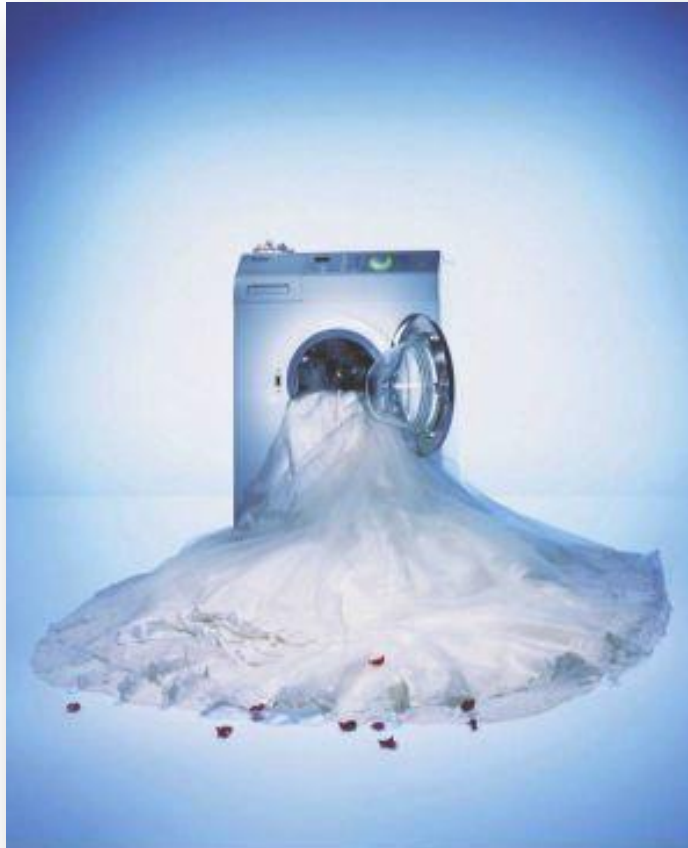




©2014 Miele 'Solar Save' dishwasher with hot-fill connection

©2008 AB Electrolux 'Sunny' clothes washer with hot-fill connect

©2009 Whirlpool 'Green Generation'



Statistically, people  
change their partner before  
they change their  
Miele washing machine.

Today the average marriage lasts 10 years. A Miele washing machine is built to last 20. It's there to wash your clothes risk-free, do your part. Faithful to the end, it's quiet, it's energy efficient and it's updatable. With Miele, every anniversary is a happy one.

[www.miele.co.uk](http://www.miele.co.uk)

# Miele

*Spare parts stocked  
for 15 years*

# B/S/H/

*Spare parts stocked  
for 10 years*

# LG

*Spare parts stocked  
for 7 years*



6  
System  
longevity





**Amana** **Consul**  
**INDESIT**



©2004 Indesit Graffiti



©3007 Consul Aquarela



©3007 Amana Jot

6  
System  
longevity



**LENSES**

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### BRASTEMP YOU

É MUITO MAIS DO QUE A COMBINAÇÃO PERFEITA



©2007 Whirlpool Latin America | Geladeiras Linha Brastemp 'You!'



## the picture of style

Pick a color that's quintessentially you. The Shades of Amana® top-freezer refrigerator collection helps you make a stylish statement. Options like Green Tea, Red or Midnight Blue paint the room with a broad brush, while Black, White and Stainless Steel draw a harmonious portrait. And if variety is the spice of your life, then the dry-erase finish on the Jot® refrigerator makes it easy to draw a design that matches your mood.

© 2009 Amana Designer Colour Palette | Aspen, Crimson, Diamond Dust, Evergreen, Ocean Blue, Oxide, Slate, Tuscan Chestnut





©2009 Amana Designer Colour Palette | Aspen, Crimson, Diamond Dust, Evergreen, Ocean Blue, Oxide, Slate, Tuscan Chestnut



**Metal, Plastic and Glass**

- Casing/Shell
- Metal
- Plastic
- Glass

- CFC-11**
- Foam
- Insulation

- PCBs**

- CFC-12**
- Refrigerant

- Used oil**



Source: www.epa.gov



# Summary

- *Ecodesign strategy tools provide designers/manufacturers approaches for minimizing adverse lifecycle consequences of products.*
- *Legislation an important driver for change.*
- *Addressing resource consumption aspects and negative lifecycle impacts of domestic appliances at product design stage makes most sense.*
- *Energy labels help consumers navigate greenwash.*
- *Manufacturers must go beyond engineering or logistical improvements: radical innovation, reduced behaviour impacts, system longevity.*
- *Explore revolutionary solutions: PSS, collaborative consumption.*
- *Empower consumers towards responsible consumption behaviours.*

# Thanks for your attention!



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