

EEDAL '09

Energy Efficiency in Domestic Appliances and Lighting

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Energy Consumption of Whitegoods:
Analysis of 15 Years of Australian Data

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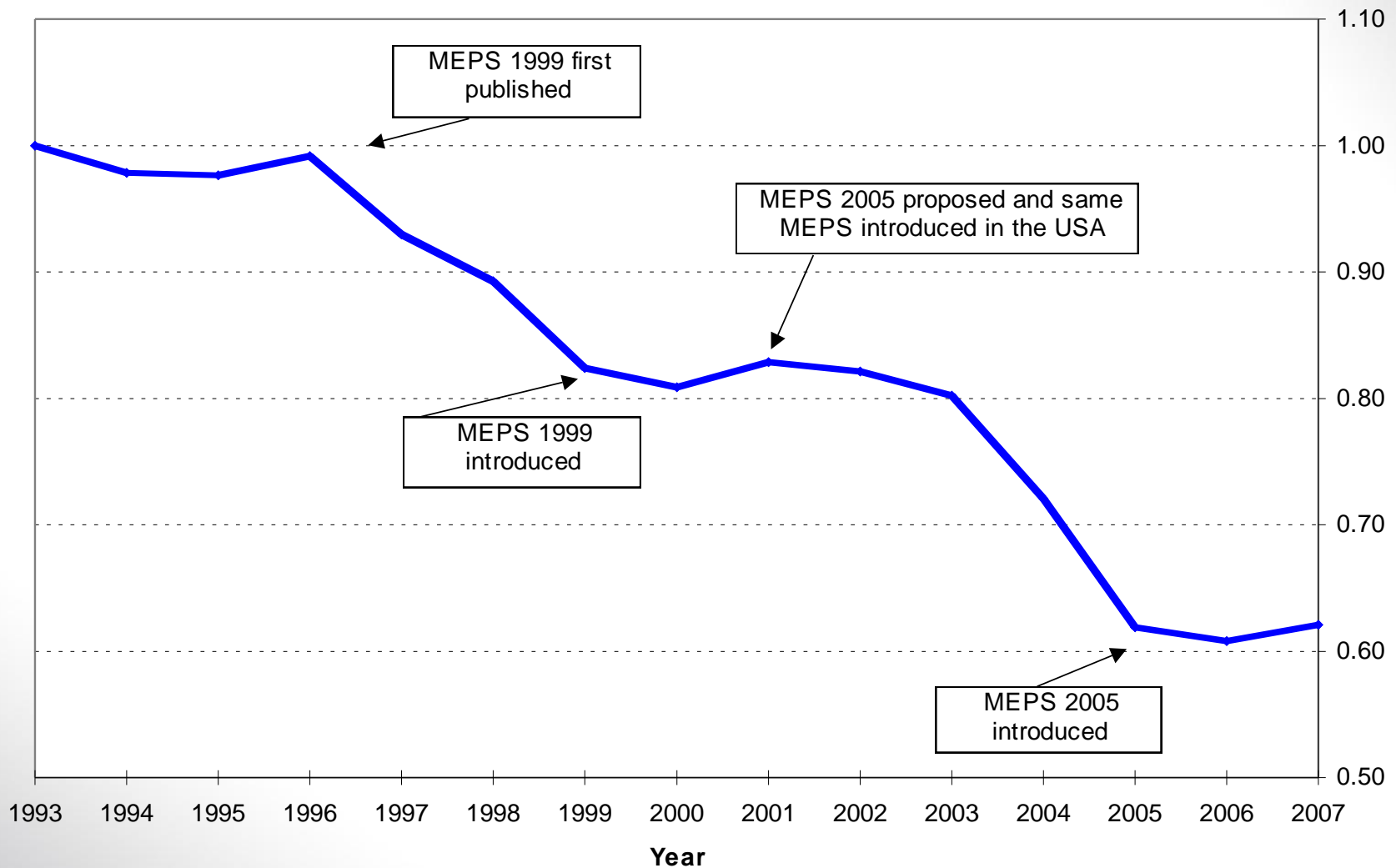
- Examines energy trends in whitegoods appliances over the years 1993 to 2007 inclusive
- The whitegoods appliance in Australia market grew significantly over this analysis period, with 2.55 million units sold in 2007 at a total retail value of just over EURO 1.0 billion
- Also looks at air conditioners – market 1 million units/year
- For the products covered, there is trend data on energy consumption, sales and characteristics
- Graphical representation of the most interesting attributes for each appliance in question
- History of energy labelling and MEPS schemes

- Data set from 1993 to 2002, covered 70-80% of the market
- Data set from 2003 onwards, 90%+ coverage of the market
- Appliances monitored:
 - Refrigerators
 - Freezers
 - Dishwashers
 - Clothes Washers
 - Clothes Dryers
 - Air Conditioners (from 2003)
- Sales data at a model level allows tracking of energy and efficiency trends, and key attributes
- Sales matched to government held registration data

- Energy labelling introduced in 1986, scale revised in 2000, with a further revision in 2010. Minimum energy performance standards (MEPS) introduced in 1999, revised in 2005 (aligned with US 2001)
- Total sales increased 4.2% pa, 950,000 in 2007
- Energy consumption decreased at 3.3% pa
- Sales weighted adjusted volume increased 0.8% pa
- Frost free 50% in 1993, 87% in 2007
- An average new refrigerator sold in 2005 consumes 60% less energy compared to 1986

Refrigerators 1993 to 2007 (base 1993)

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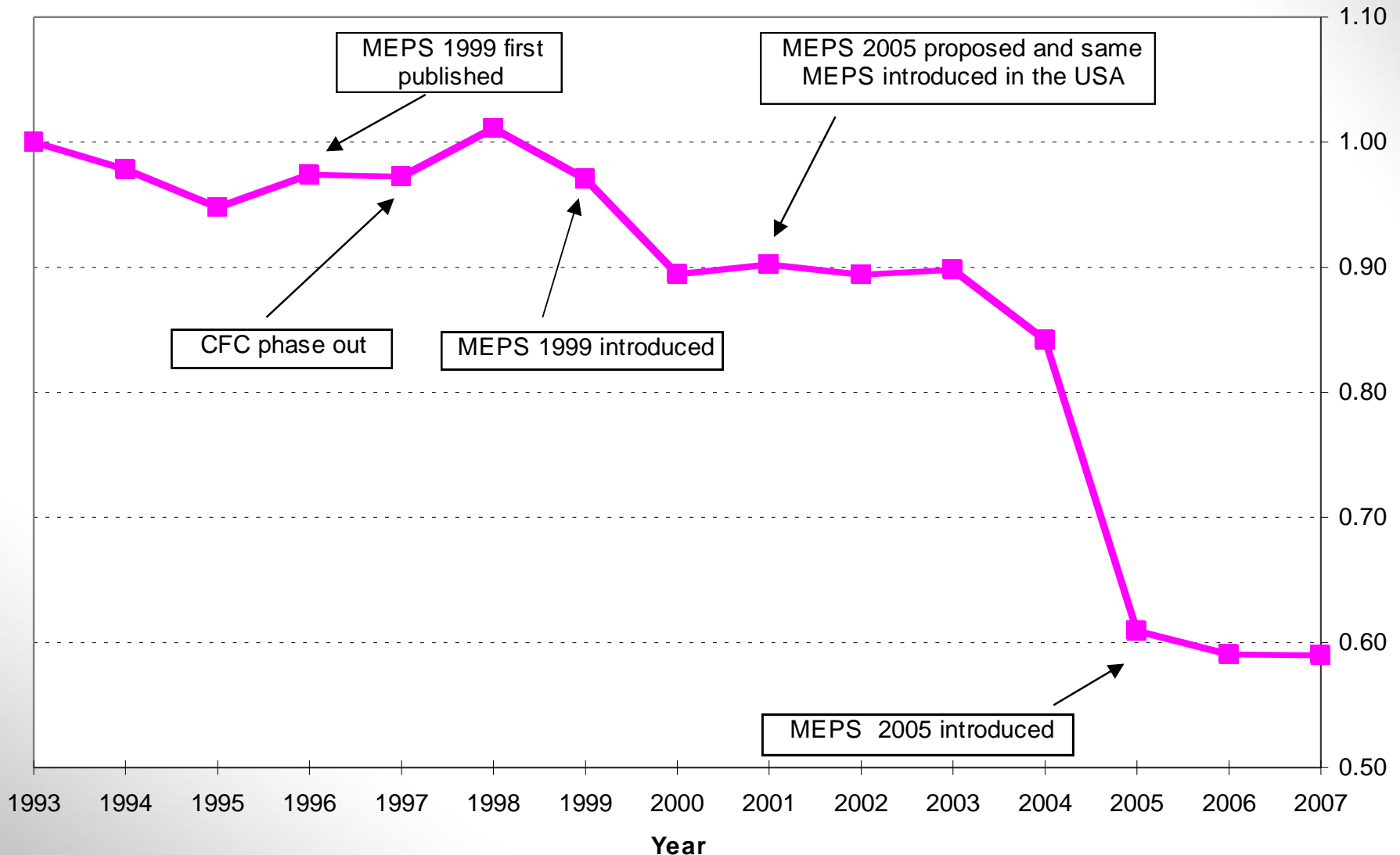


• Figure 1 - Energy Consumption of Refrigerators

- Energy labelling introduced in 1986, scale revised in 2000, with a further revision in 2010. Minimum energy performance standards (MEPS) introduced in 1999, revised in 2005 (aligned with US 2001)
- Total sales increased 5.2% pa, 220,000 in 2007
- Energy consumption decreased at 3.7% pa
- Sales weighted adjusted volume decreased 0.7% pa
- Frost free share stable at about 20%
- Energy consumption falls prior to MEPS as redesigned products enter the market as they are developed

Freezers 1993 to 2007 (base 1993)

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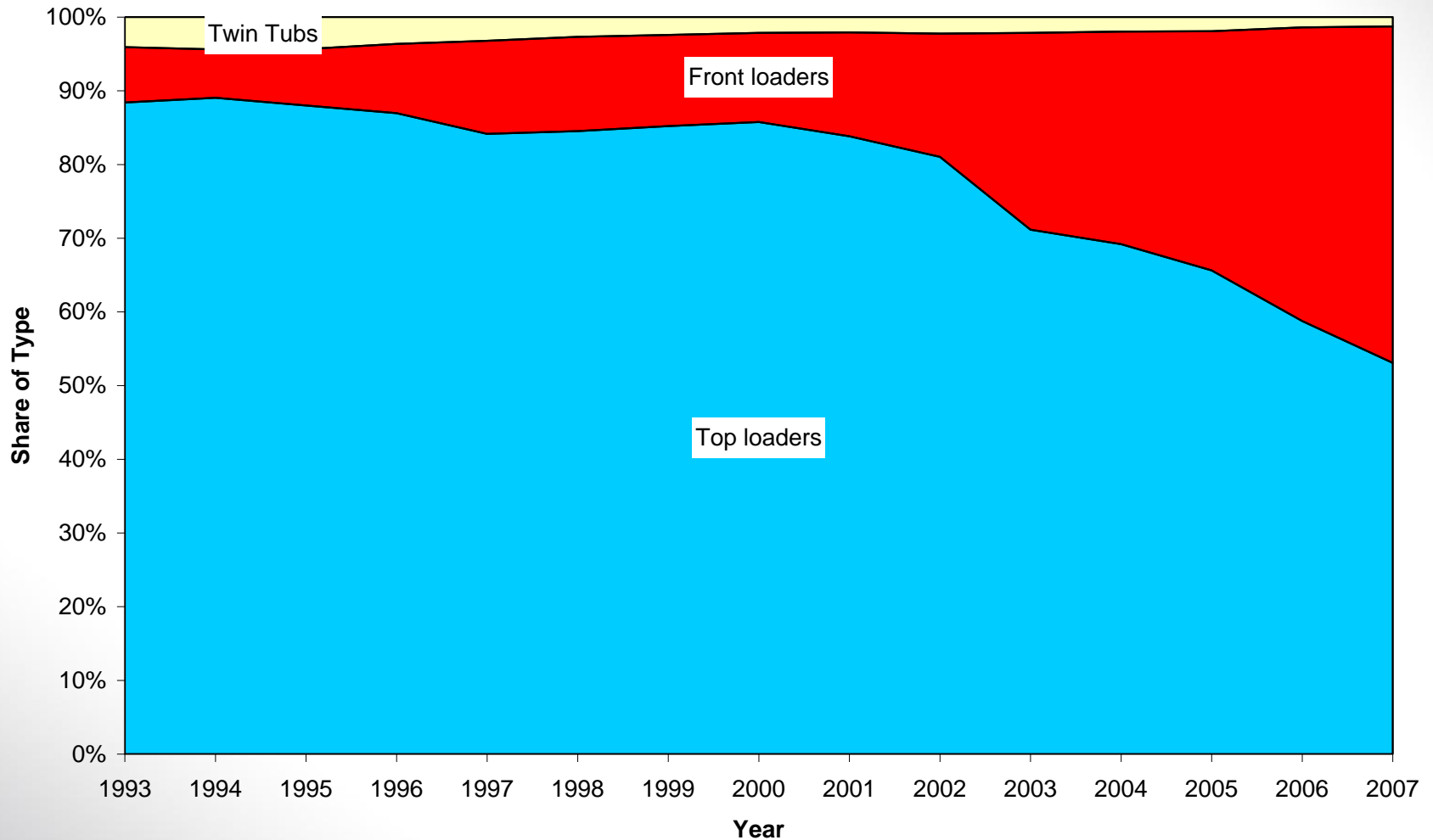


• Figure 2 - Energy Consumption of Freezers

- Energy labelling introduced in 1990, scale revised in 2000. No MEPS. Voluntary water labelling in 1990's, mandatory water efficiency labelling in 2006
- Total sales increased 4.5% pa, 775,000 in 2007
- 1993: drum 7.5%, vertical axis 88.5%
- 2007: drum 44%, vertical axis 55%
- Capacity increase 1.9% pa (both types similar)
- Water consumption decreased 3.5% pa since 1993
- Energy consumption decreasing – from increased share of drum type, no improvement within each type

Clothes Washers 1993 to 2007

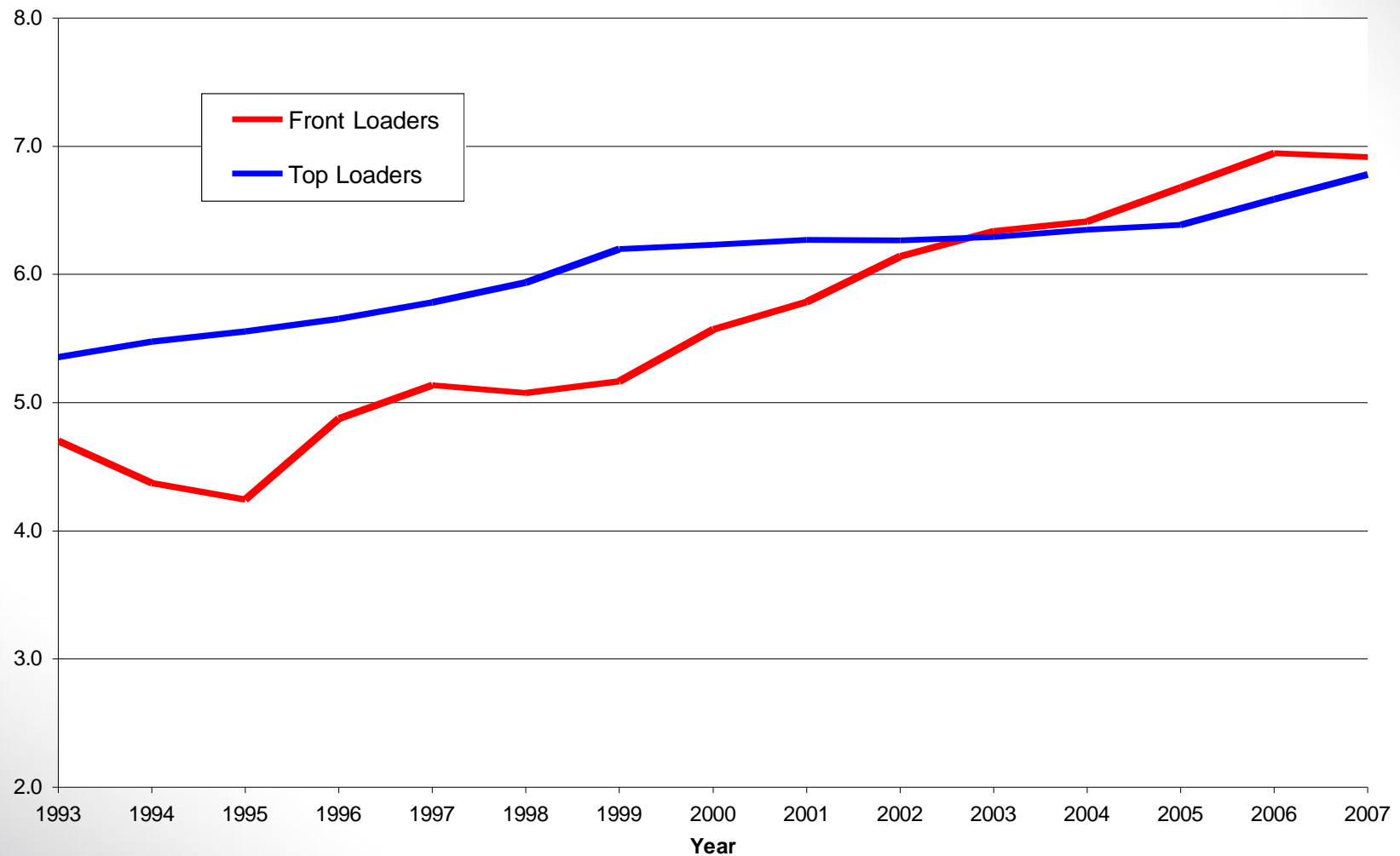
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- Figure 3 – Share of Clothes Washer Type

Clothes Washers 1993 to 2007

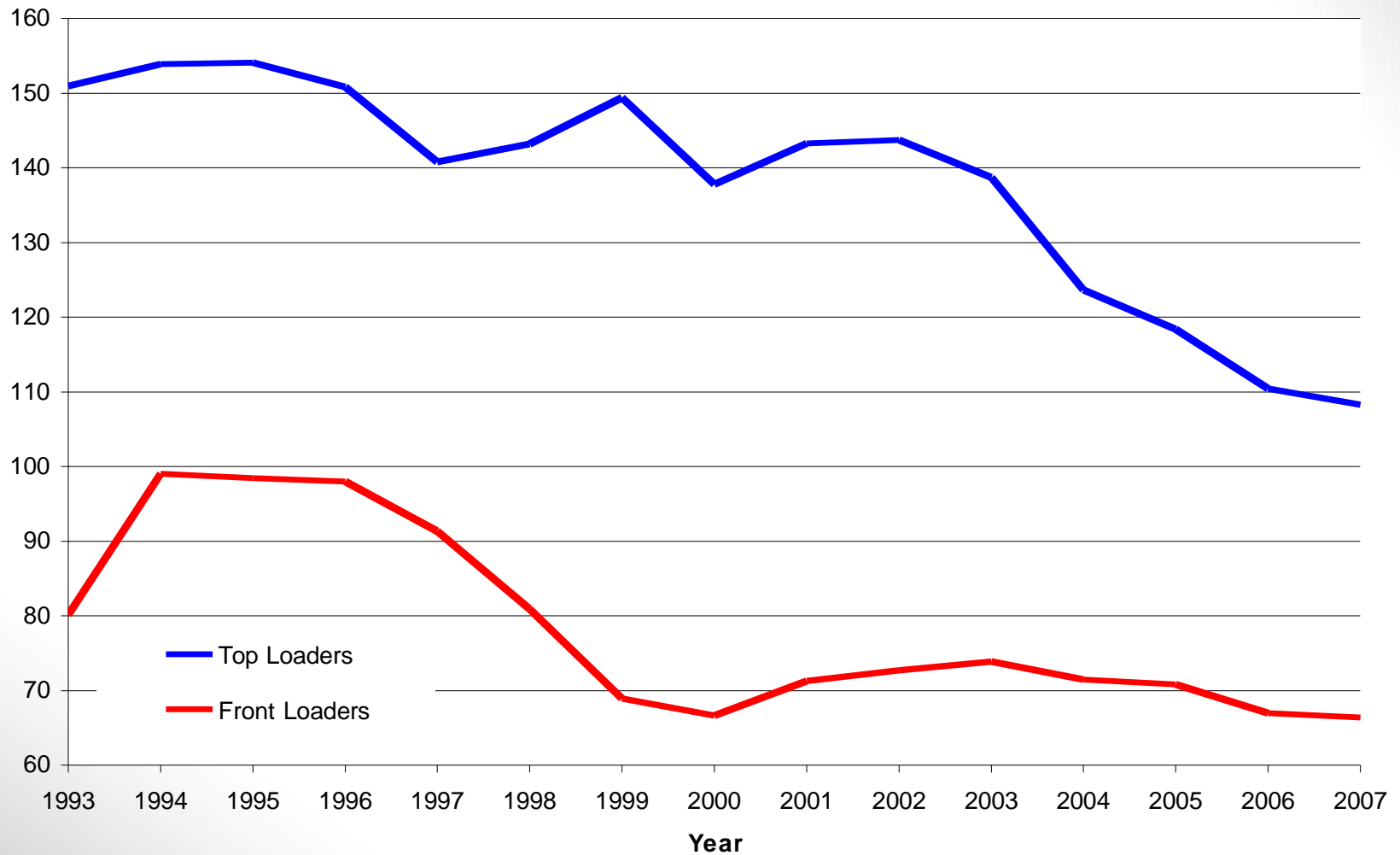
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- Figure 4 – Clothes Washer Rated Capacity Trends

Clothes Washers 1993 to 2007

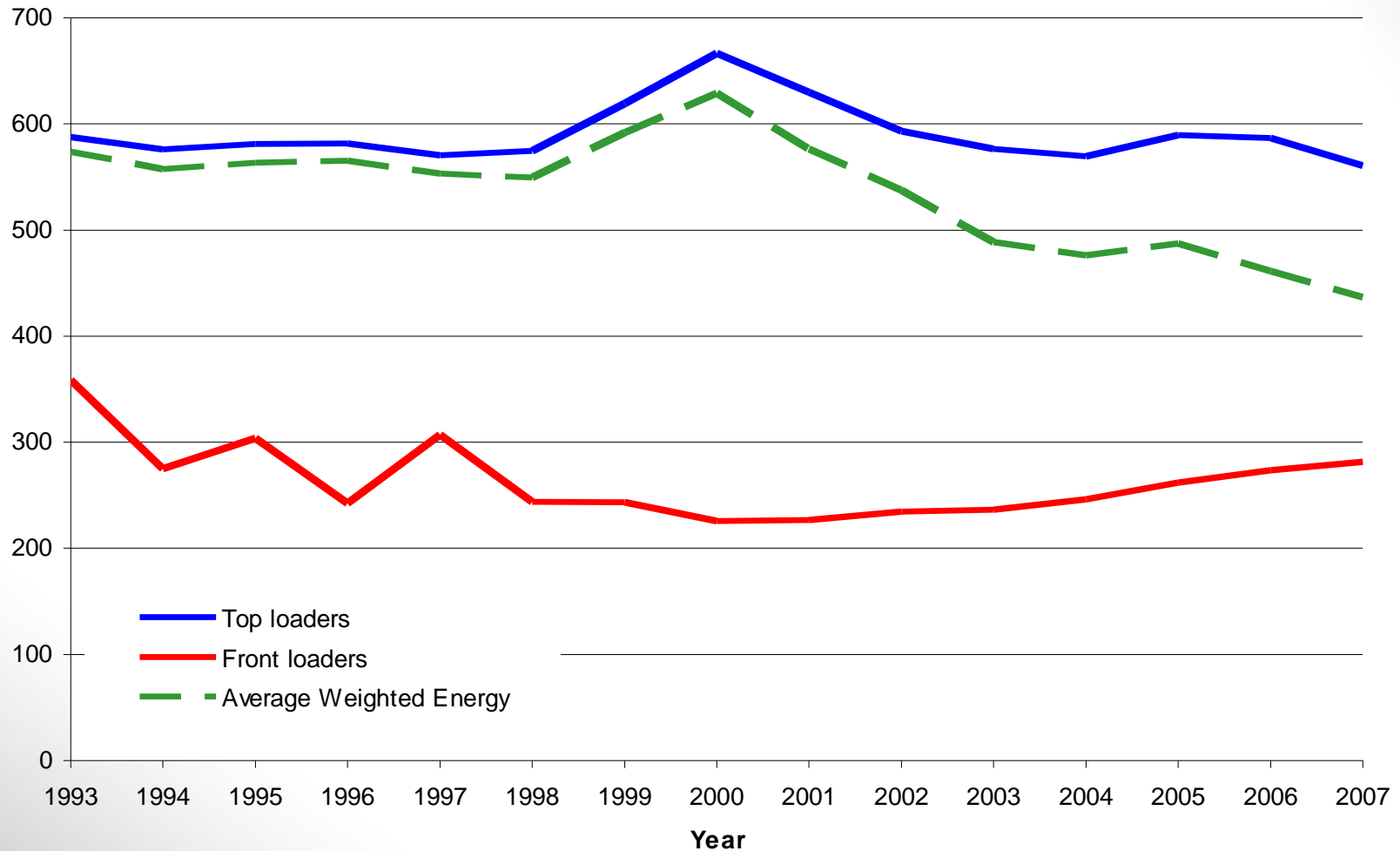
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- Figure 5 – Clothes Washer Water Consumption Trends

Clothes Washers 1993 to 2007

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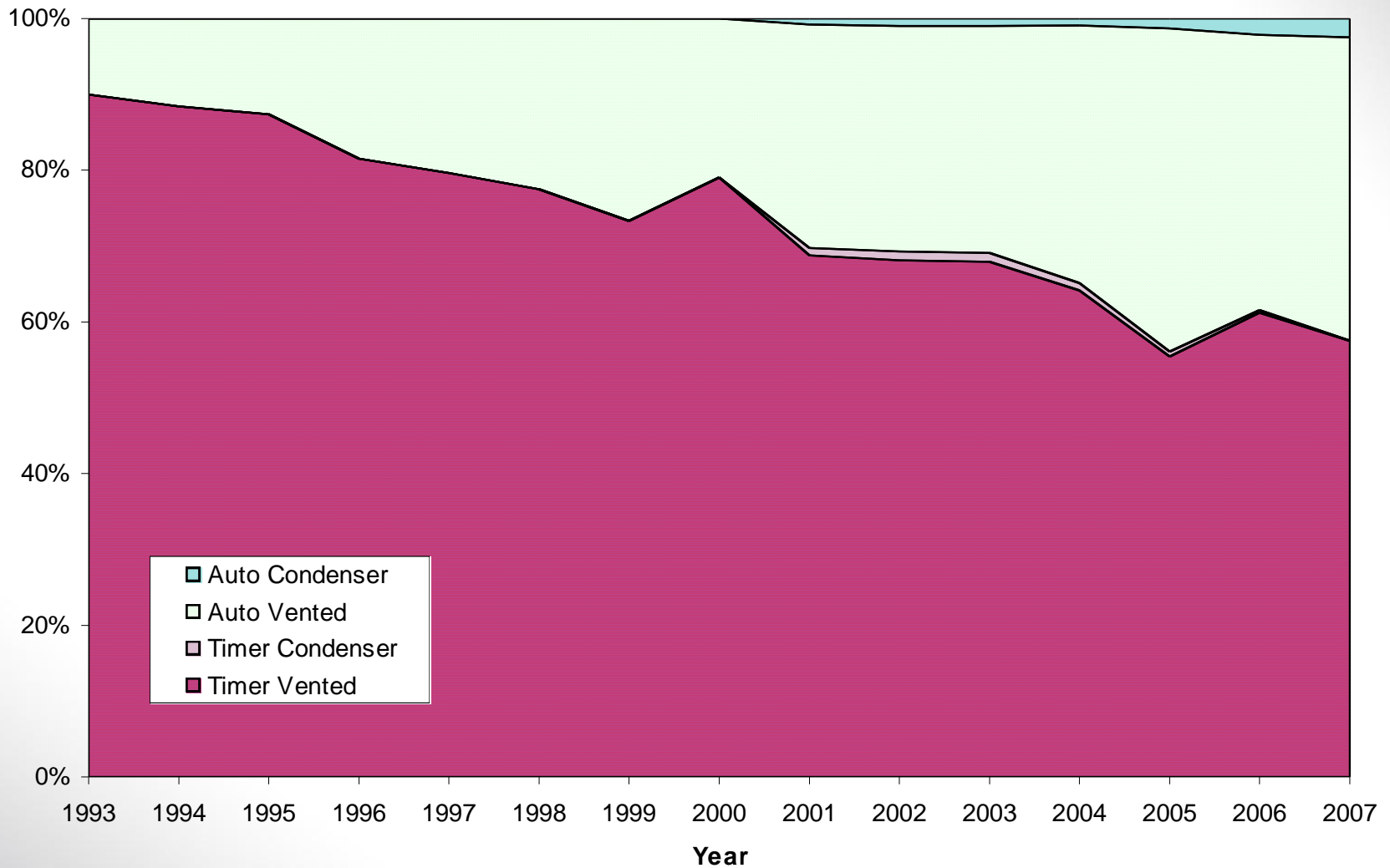


• Figure 6 – Clothes Washer Energy by Type

- Labelling introduced in 1989, scale revised in 2000.
- Total sales increased 4.8% pa, 295,000 in 2007
- Energy consumption decreased at an average of 0.7% per annum from 1993 to 2007 – no real change
- Little change in capacity or program time
- Condenser share less than 3%, heat pump appearing
- Auto-sensing increased from 10% to 41%
- Combination washer/dryers now 10% of dryer sales. The local concern is that many of these units use a large volume of water during the drying function; some use more in the drying cycle than the washing cycle

Clothes Dryers 1993 to 2007

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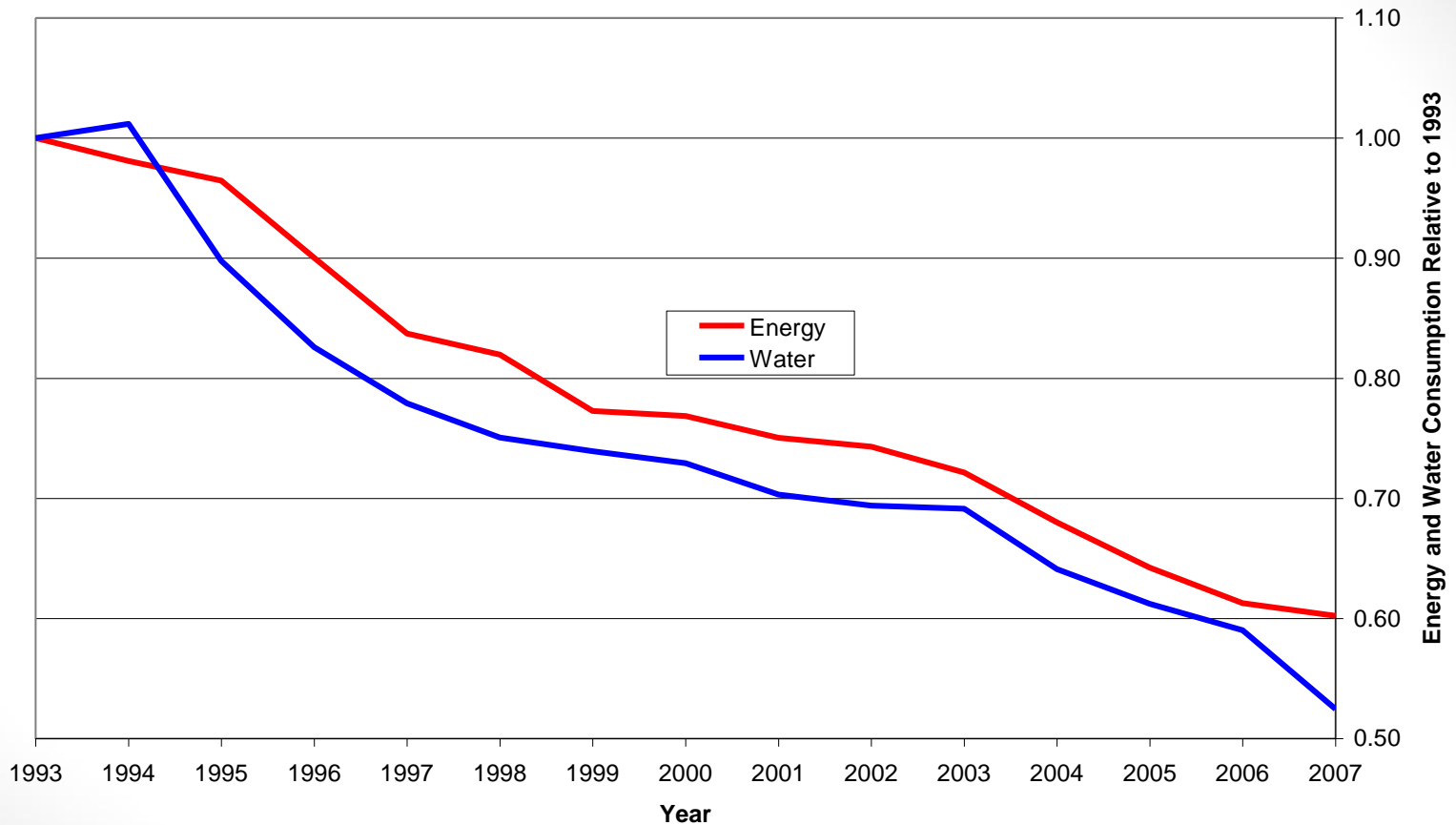


- Figure 7 – Share of Clothes Dryer Type

- Energy labelling introduced in 1990, scale revised in 2000. No MEPS. Voluntary water labelling in 1990's, mandatory water efficiency labelling in 2006
- Total sales increased 6.7% pa, 310,000 in 2007
- Energy consumption decreased at an average of 3.6% per annum from 1993 to 2007, now 40% decrease since 1993
- Water consumption decreased at an average of 4.5% per annum since 1993, now 47% decrease since 1993

Dishwashers 1993 to 2007 (1993 base)

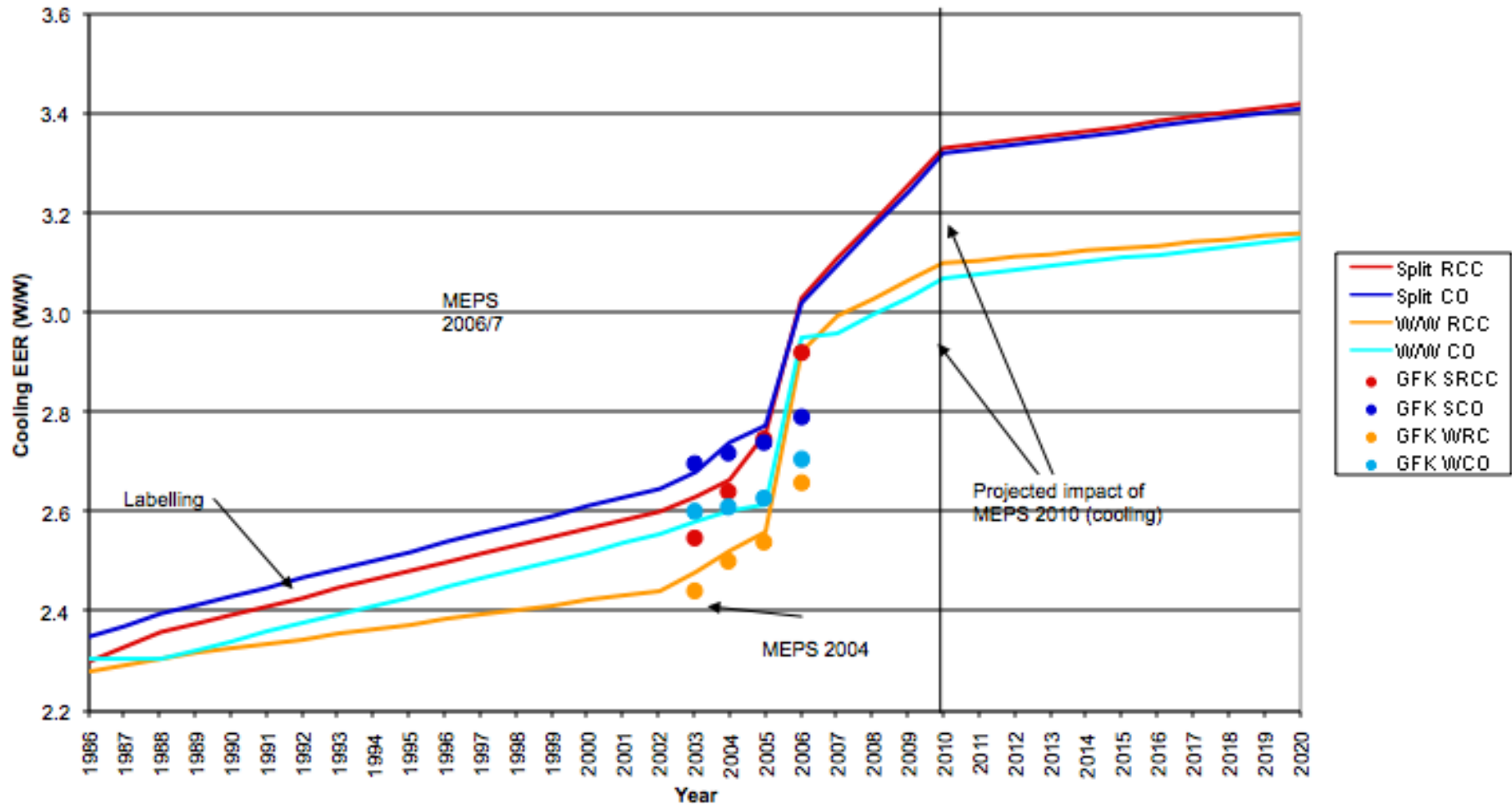
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- Figure 8 – Energy and Water Consumption of Dishwashers

- Energy labelling introduced in 1987, scale revised in 2000, with a further revision in 2010. MEPS for 3 phase introduced in 2001 and single phase in 2004. Levels upgrade in 2006, 2007, 2010, 2011 and 2012
- Total sales equalled around 1 million units sold in 2007, around a third of these were for the commercial sector, two thirds residential sector
- EER and COP have both increased at an average of 4.6% and 4.2% per annum respectively from 2003 to 2007 – driven by MEPS

Scenario A: MEPS 2010 + label regrade 2010



• Figure 9 – Trends for EER of Non-ducted Air Conditioners

- All appliances covered by mandatory energy labelling schemes, apart from clothes dryers, have shown a substantial and ongoing decreases in energy consumption
- However, efficiency may not keeping up with stock increases
- The 2005 revision of MEPS for refrigerators and freezers had a significant impact: about 12% pa in the preceding two years
- Prices for all products types tracked have decreased in real terms over time, despite increases in energy efficiency
- Ongoing collection of detailed sales data is a valuable tool in the assessment of delivered energy savings: provides a firm basis for assessing and evaluation of energy policy options
- Need to understand test procedure vs real life usage

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Thank you for your attention