Case study: Innovation in the circulator sector after the adoption of Ecodesign requirements.

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GRUNDFOS Holding A/S

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Circulators in EU27

- Installed base of 140 millions circulators
- Market of 14 million circulator
- Electrical energy consumption in 2009 is 50 TWh (50 billion kWh)
- Expected electrical energy consumption in 2020 if no action are taken is 55 TWh

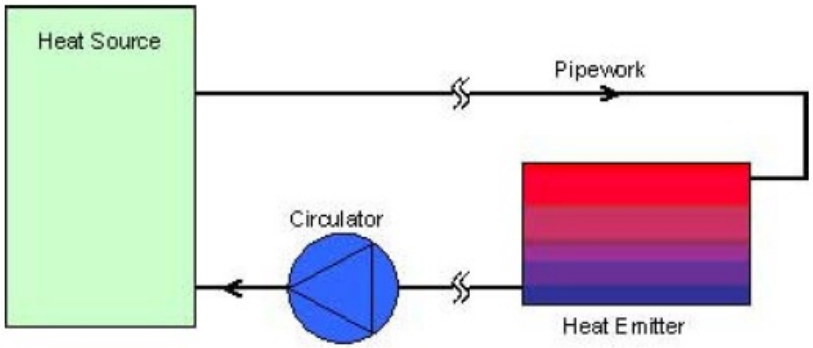


Circulator market

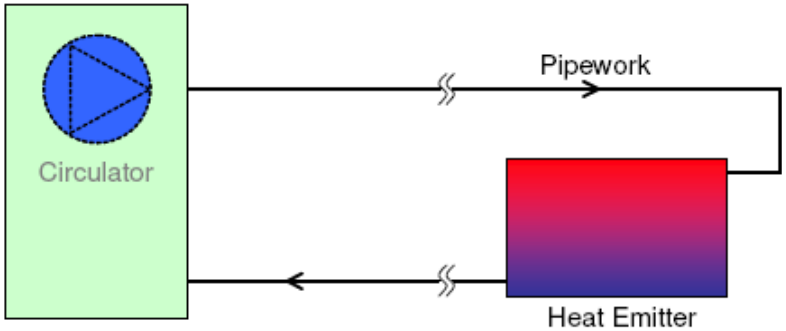
The annual market for circulators is considered to be 14M pa, comprising:

- Standalone (small) circulators 5.5M
- Boiler integrated circulators 7.5M
- Standalone (Large) circulators 1.0M

It is estimated that the circulator market will increase at the rate of 1.4%pa to 2020.

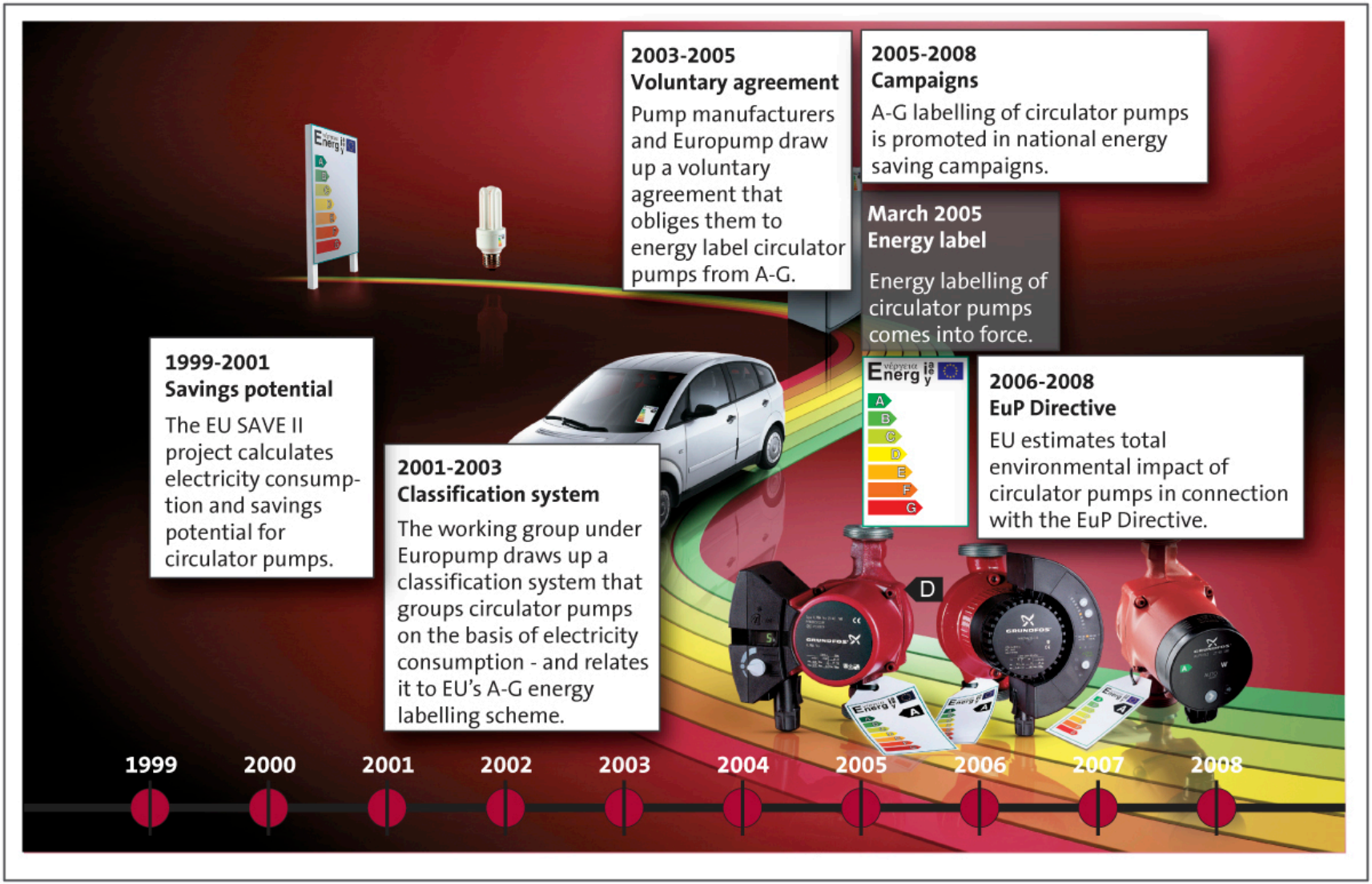








The path to legislation for circulators



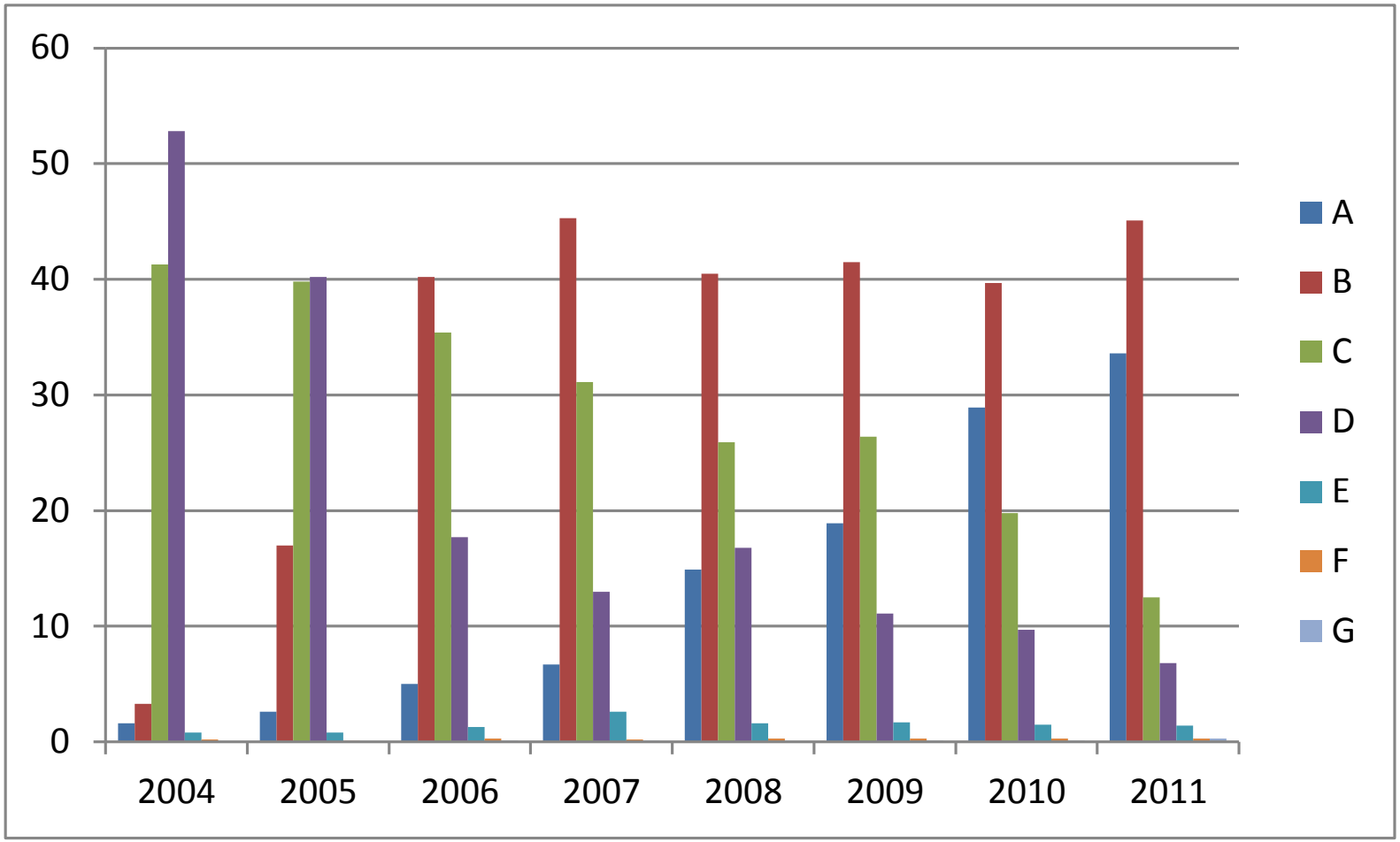
Pole Position Project – an accelerated innovation project

- Internal Grundfos development project 2004-2005
- Extremely accelerated – 15 month from start to market
- The aim was to bring our small circulators in ”pole position” for the A-G labelling ”race”
- Development of a small high efficiency variable speed A-rated circulator, which had a competitive price and prepared for mass production

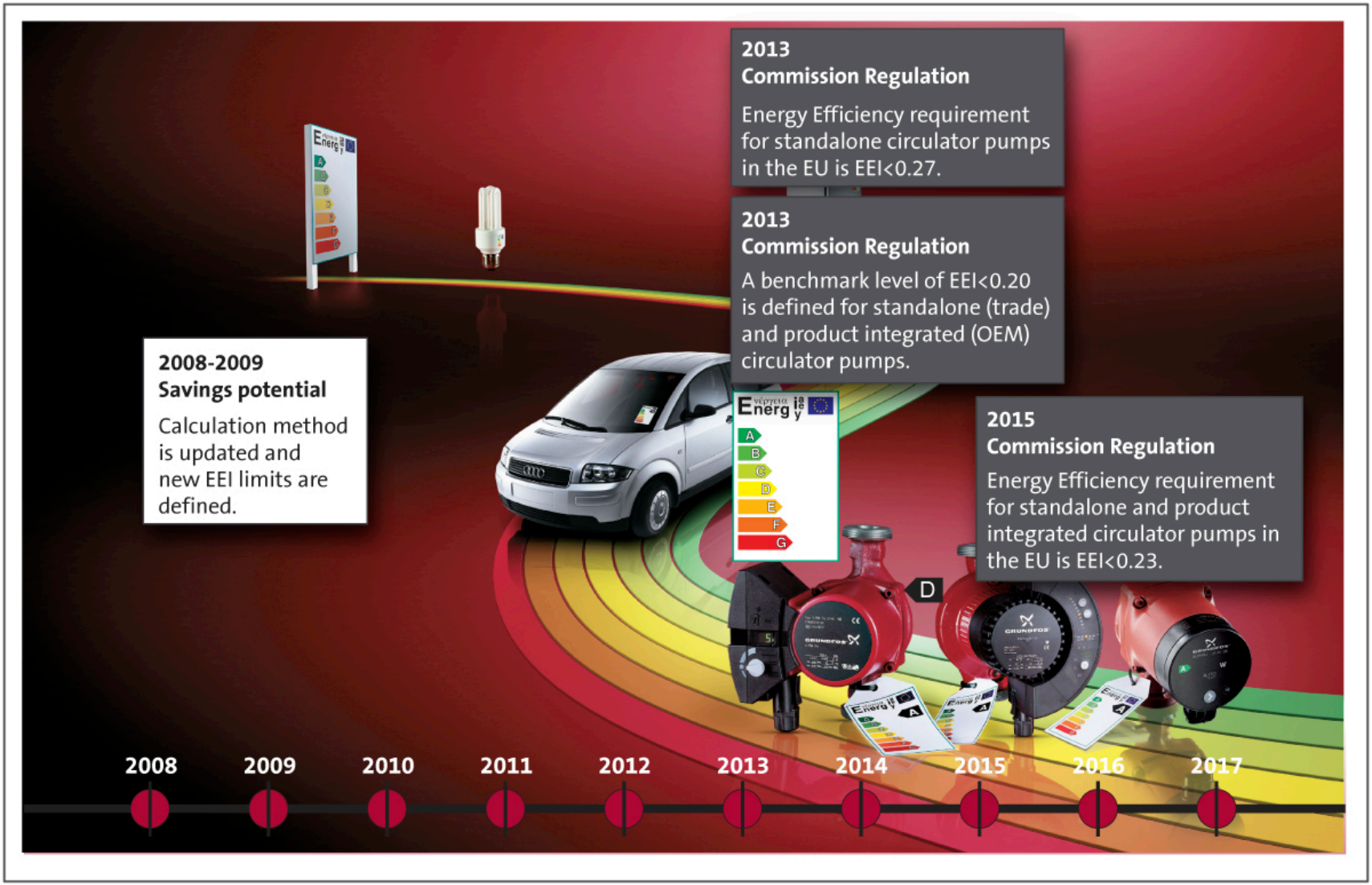
Marketing used A-G labelling to accelerate market transformation toward high efficiency circulator



Market transformation due to A-G labelling of circulators



The path to legislation for circulators (cont…)



Ecodesign requirements for circulators adopted in July 2009*

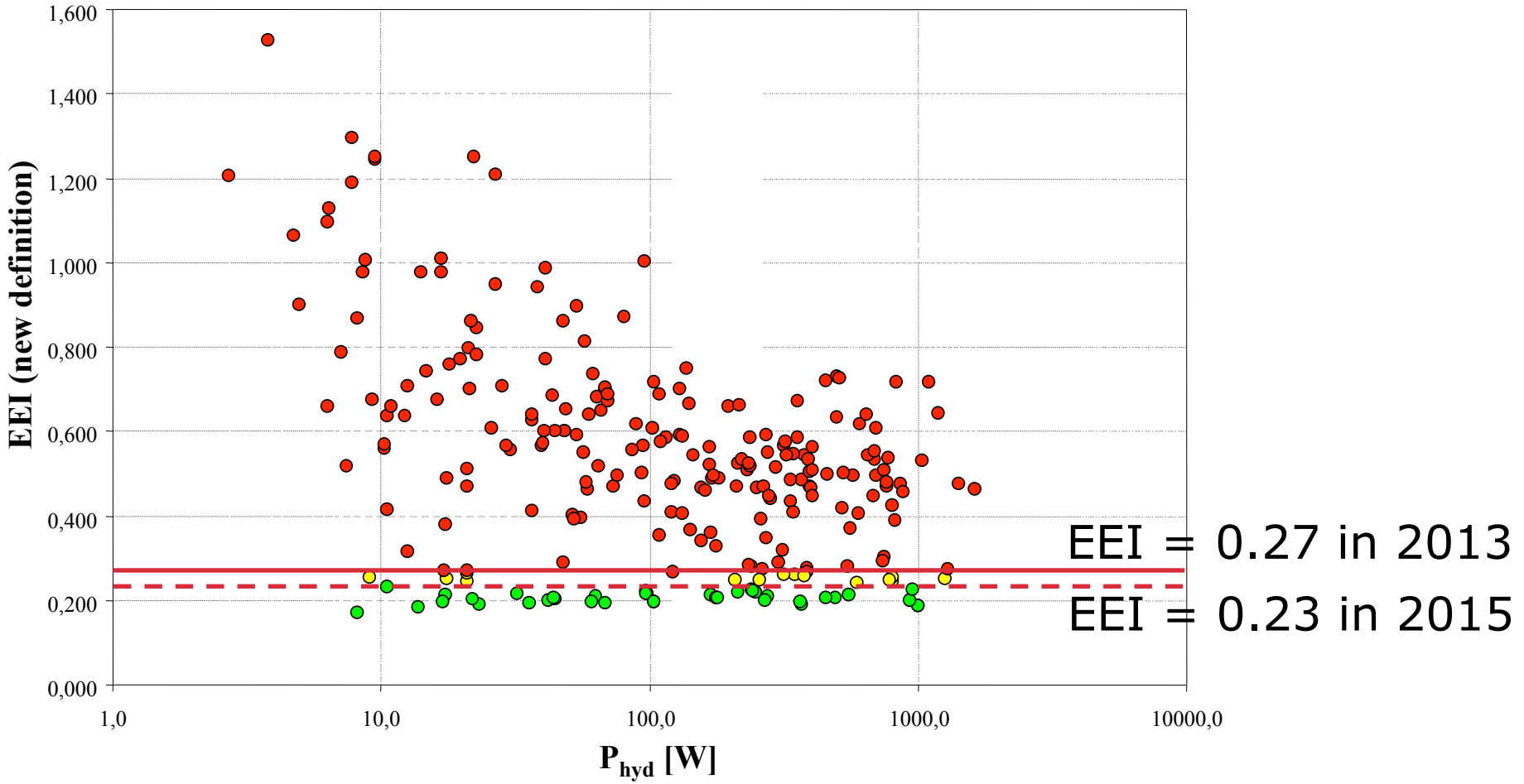
- **2013 Energy Efficiency requirements**
  - From 1 January 2013, glandless standalone circulators, with the exception of those specifically designed for primary circuits of thermal solar systems and of heat pumps, shall have an energy efficiency index (**EEI**) of not more than **0.27**

- **2013 Benchmark level**
  - From 2013 the benchmark for the best available technology on the market for circulators is **EEI ≤ 0.20**. Please note that this is NOT an energy efficiency requirement but a benchmark, or indicative, level.

- **2015 Energy Efficiency requirements**
  - From 1 August 2015, glandless standalone circulators and glandless circulators integrated in products shall have an energy efficiency index (**EEI**) of not more than **0.23**

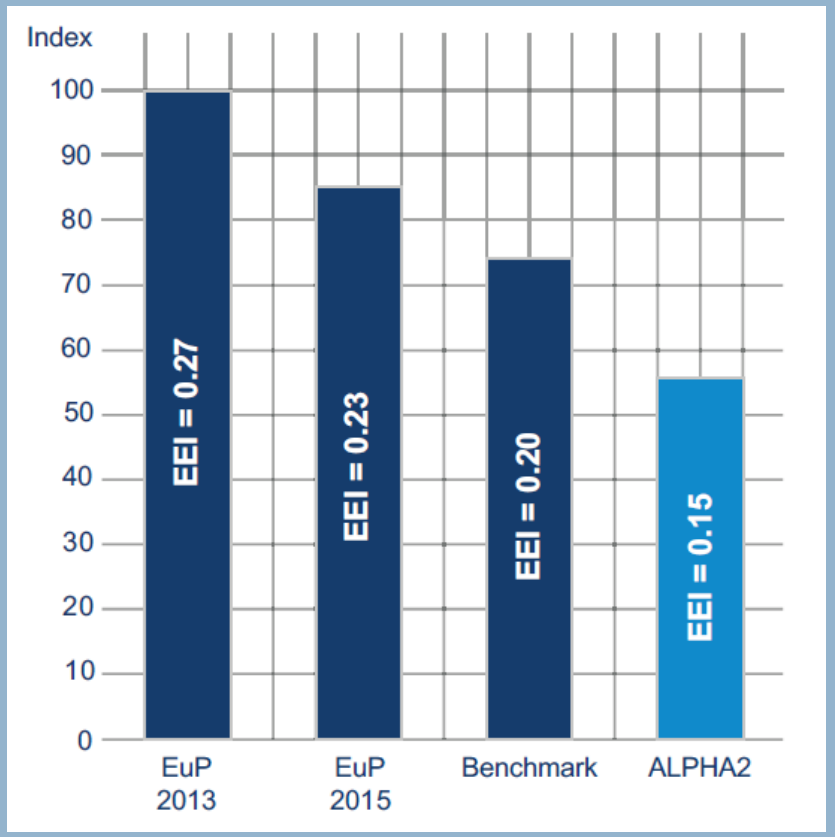
*COMMISSION REGULATION 641/2009 (EC)

“Cut off” of circulators due to legislation



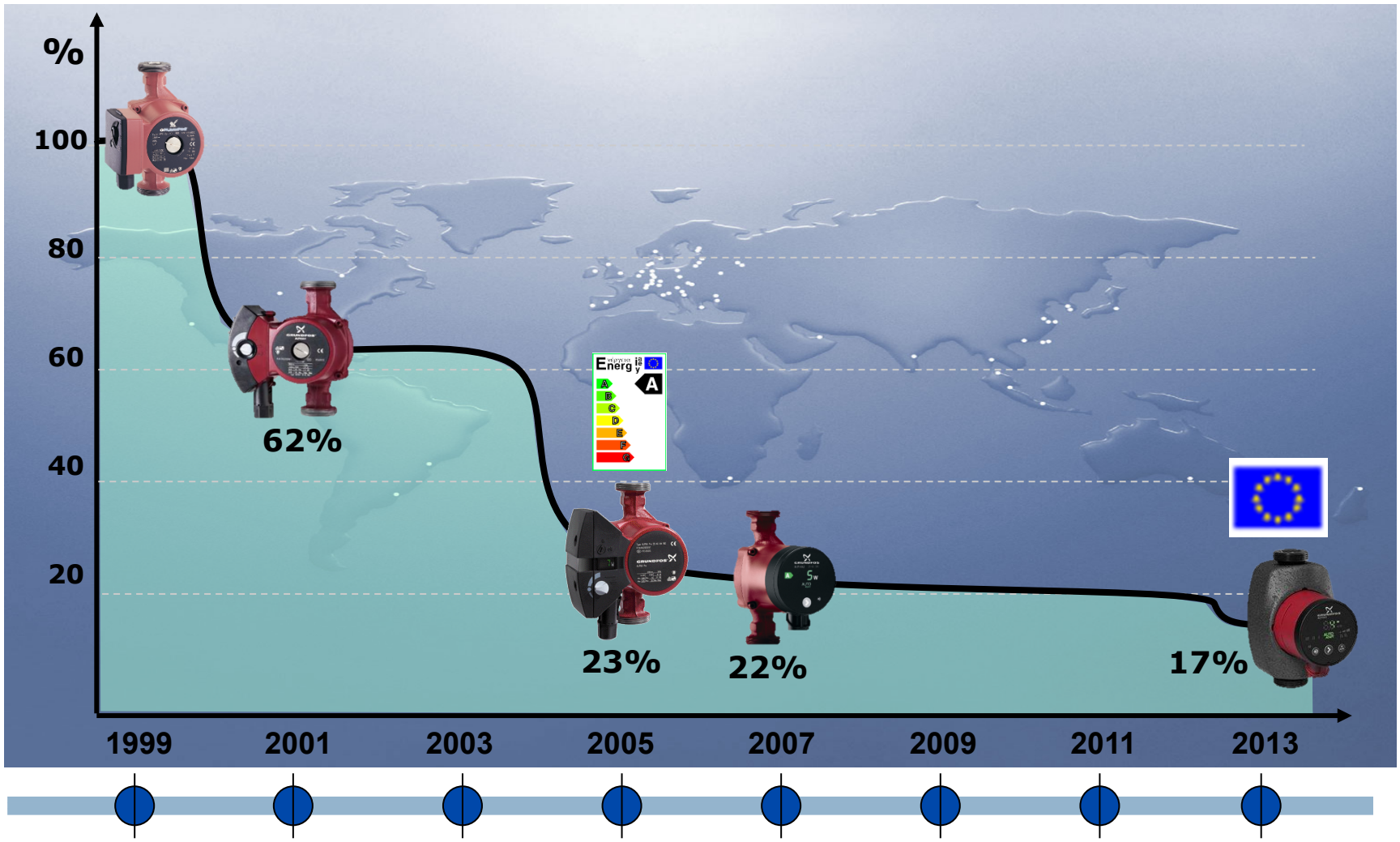
Source: Europump, 2009

New energy efficiency targets after the adoption of Ecodesign requirements.

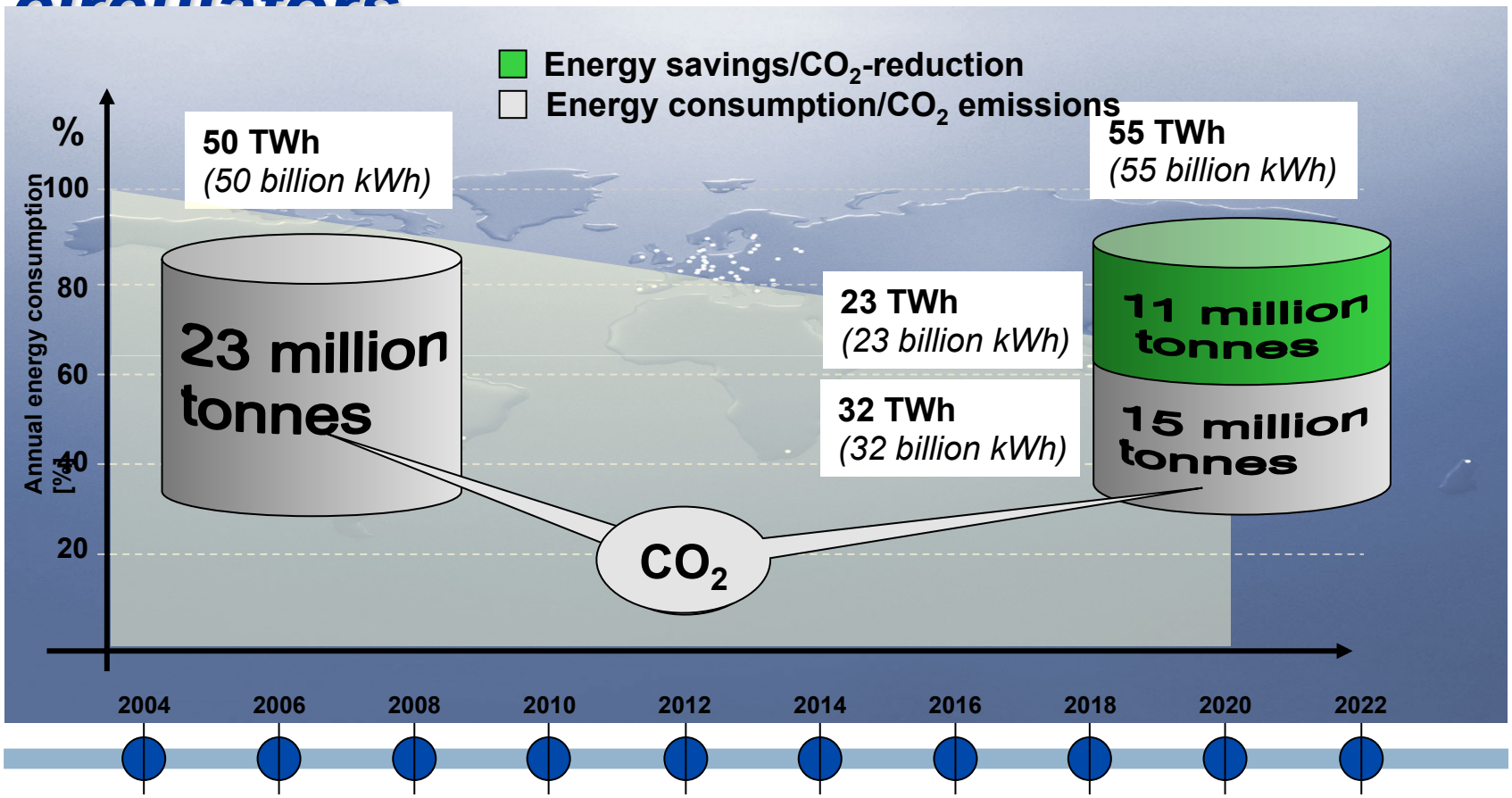




Reduction in annual energy consumption of Grundfos small circulators



Reduction in energy consumption and CO_2-emissions due to EU legislation on *circulators*



Summary 1/2



- A-G labelling and ecodesign requirements have influenced the innovation of high efficiency small circulators and the market transformation significantly
  - The annual energy consumption of the most energy efficient circulators today is only **17%** of the consumption of the typical installed circulator
  - The A-G labelling have resulted in a significant market transformation. A-rated circulators have increased from **1.6%** to **33.6%** in the period from 2004-2011.
  - Ecodesign requirements will only allow circulators with an efficiency similar to the current A-rated circulators to be placed on the market in EU after 2013 and only the best 30% of these circulators is allowed to be placed on the EU market after 2015.

Summary 2/2



- After the adoption of the ecodesign requirements for circulators in 2009 benchmark values and EEI in general have further influenced the innovation
  - Circulators exceeding the benchmark requirements have been developed
  - Marketing based on EEI

- A-G labelling and ecodesign requirements for circulators have implied shifts in technology, but the EEI methodology behind the ecodesign requirements does not prescribe any specific technology and does not have any detrimental effect on the innovation in the circulator sector