

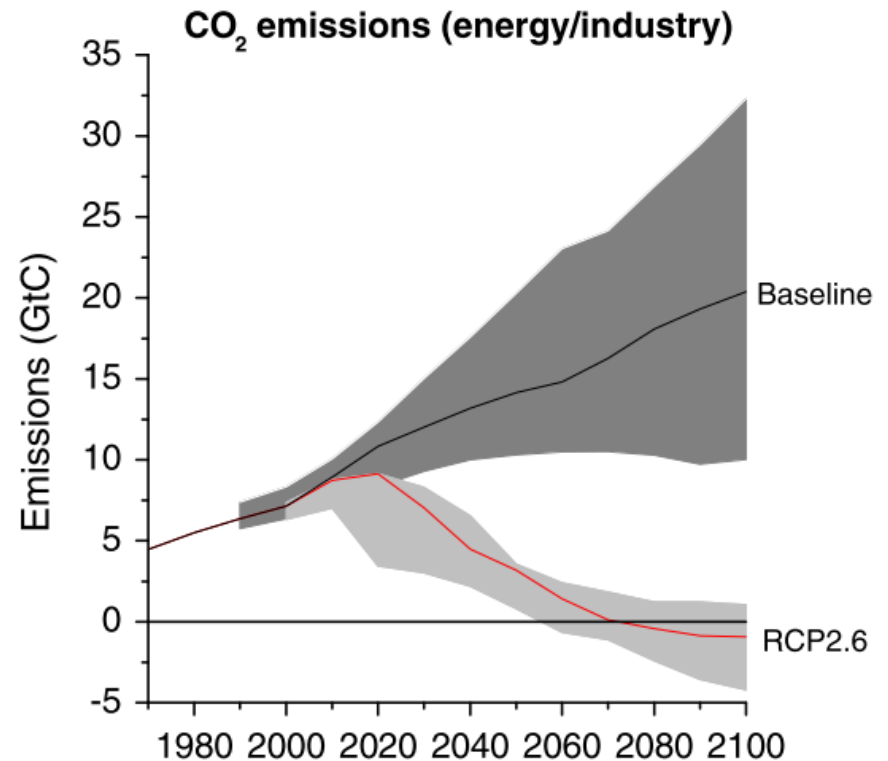


Mainstreaming low carbon innovations: Learnings from the past and challenges ahead

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Technology (ETH Zurich)**

Climate mitigation requires a variety of low carbon innovations

- For 2 degree climate target GHG emission have to be reduced by 80% by 2050 (cf. Figure)
- This requires the development and deployment of a variety of low carbon innovations.
- Innovations will not diffuse fast enough without climate policy support.



Source: van Vuuren et al. (2011) RCP2.6: exploring the possibility to keep global mean temperature increase below 2° C. *Climatic Change*, 109(1-2), 95–116.

Effective climate policies requires instruments beyond carbon tax

Table 2

Items measuring the acceptability of climate policy measures, including means, standard deviations, and factor loadings.

	<i>M</i>	Supportive measures	CO ₂ restrictions
1. Subsidies for building and renovating according to the MINERGIE ^a standard (with low energy demand)	5.32	.82	.21
2. Subsidies for electricity generation from renewable energy (such as solar or wind energy)	5.23	.80	.26
3. Subsidies for research projects in the field of climate-friendly technology	5.19	.70	.29
4. Extension of public transportation	5.07	.44	.47
5. Subsidies for alternative heating systems (such as wood firing or heat pumps)	5.01	.80	.11
6. Binding CO ₂ emission limits for new cars	5.19	.44	.60
7. Bonus malus system for cars taxes	4.68	.28	.74
8. Increase of CO ₂ tax on heating oil (from now 9 Rp/Lt to 18 Rp/Lt)	3.79	.16	.87
9. CO ₂ tax on gasoline and diesel (15 RP/Lt)	3.78	.13	.91

Note. Acceptability of policy measures was rated on a 6-point Likert scale ranging from 1 (not acceptable at all) to 6 /very acceptable). The factor loadings >.3 are set in bold.

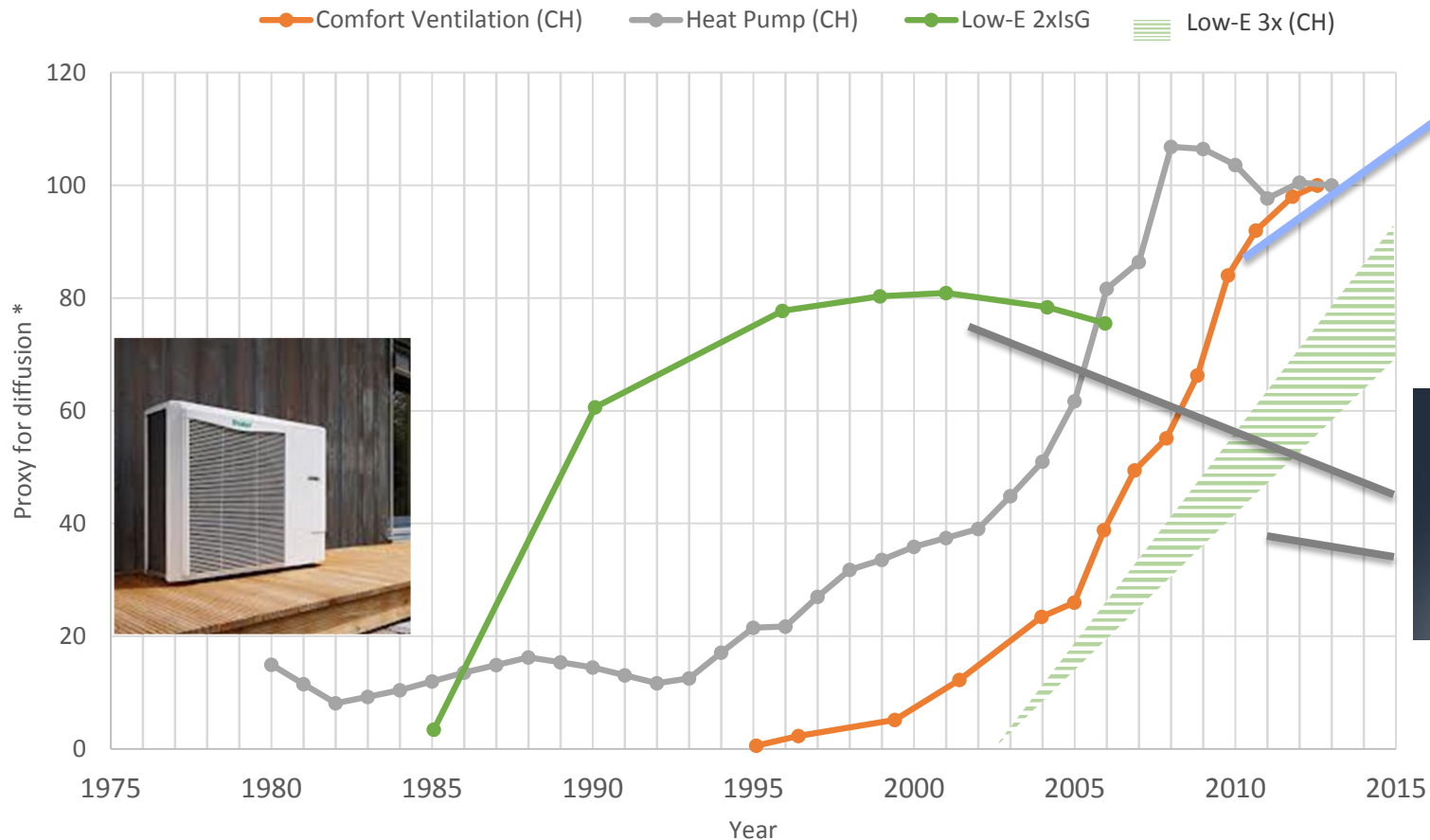
a Sustainability brand for new refurbished buildings.

- Low acceptance for carbon tax, high acceptance for supportive instruments.
- Similar results from surveys in other countries (e.g. US).

Source: Tobler C, Visschers VHM, Siegrist M. Addressing climate change: Determinants of consumers' willingness to act and to support policy measures. J Environ Psychol 2012;32:197–207. doi:10.1016/j.jenvp.2012.02.001.

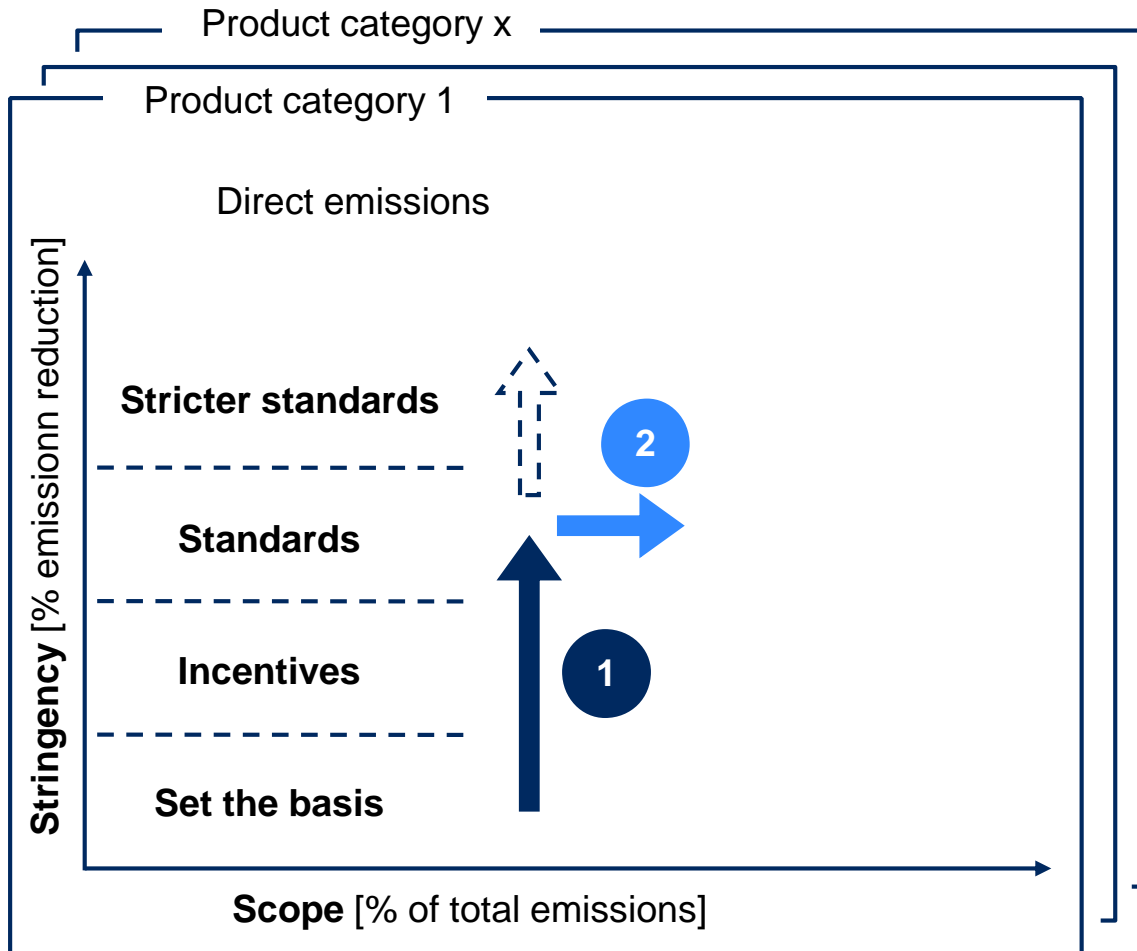
Supporting policies can be highly effective but need to be tailored to technologies

Development of low carbon innovations



General structure of regulatory approach to fostering diffusion of low carbon technologies

Stylized dynamics of product-oriented climate policy development



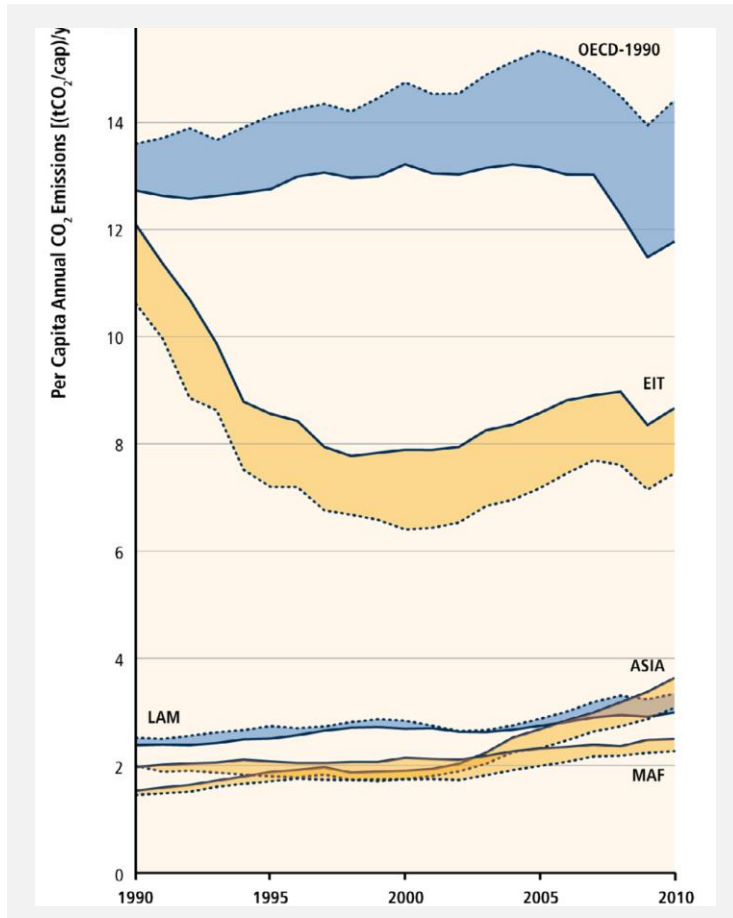
- 1 Stepwise evolution towards stringent standards
- 2 Broaden scope of standards to similar products

Source: Girod, B., Product-oriented climate policy: learning from the past to shape the future, Journal of Cleaner Production (2015), <http://dx.doi.org/10.1016/j.jclepro.2015.07.010>

Key challenge ahead: Current climate policy is blind for embodied emissions

Decreasing territory, increasing consumption based emissions

How to promote innovation with low indirect emissions?

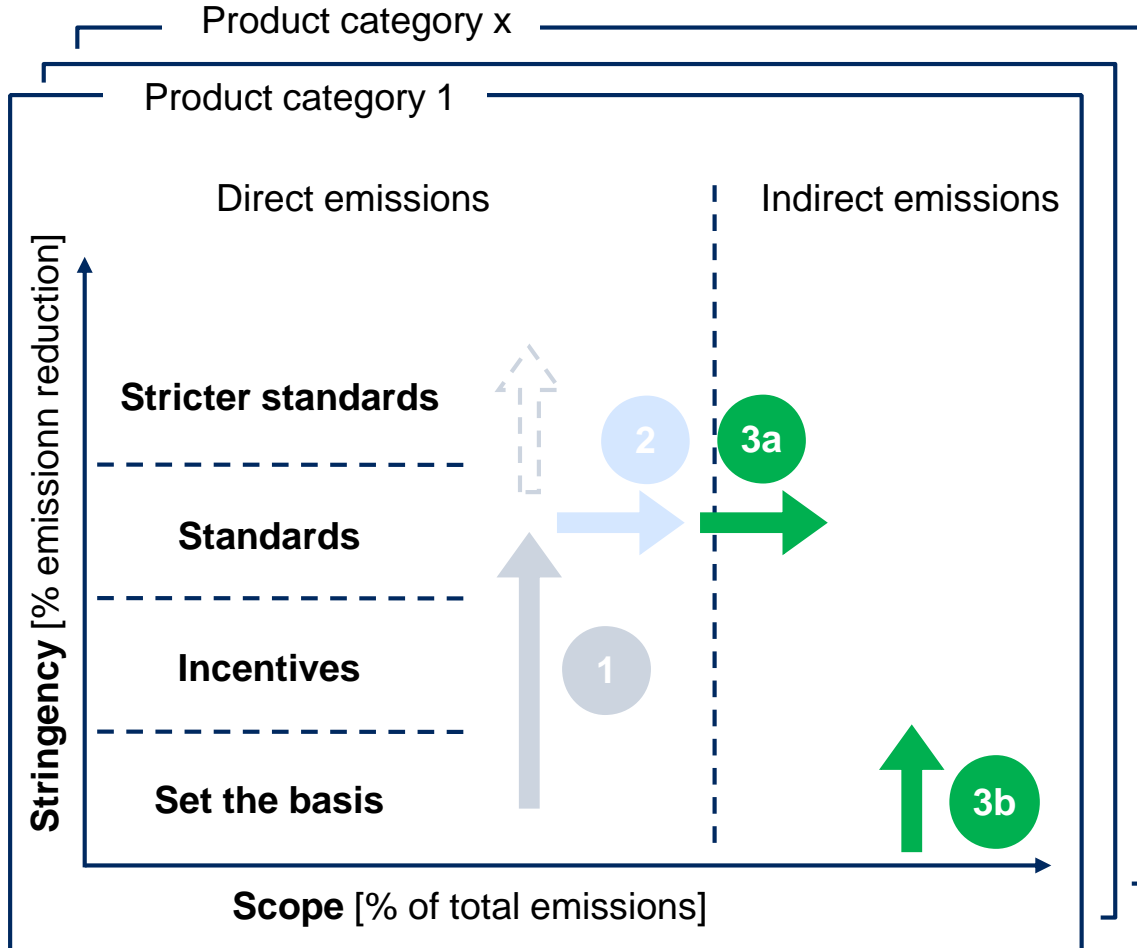


Source: IPCC, 2014, Figure 5.14



General structure of regulatory approach to fostering diffusion of low carbon technologies

Stylized dynamics of product-oriented climate policy development

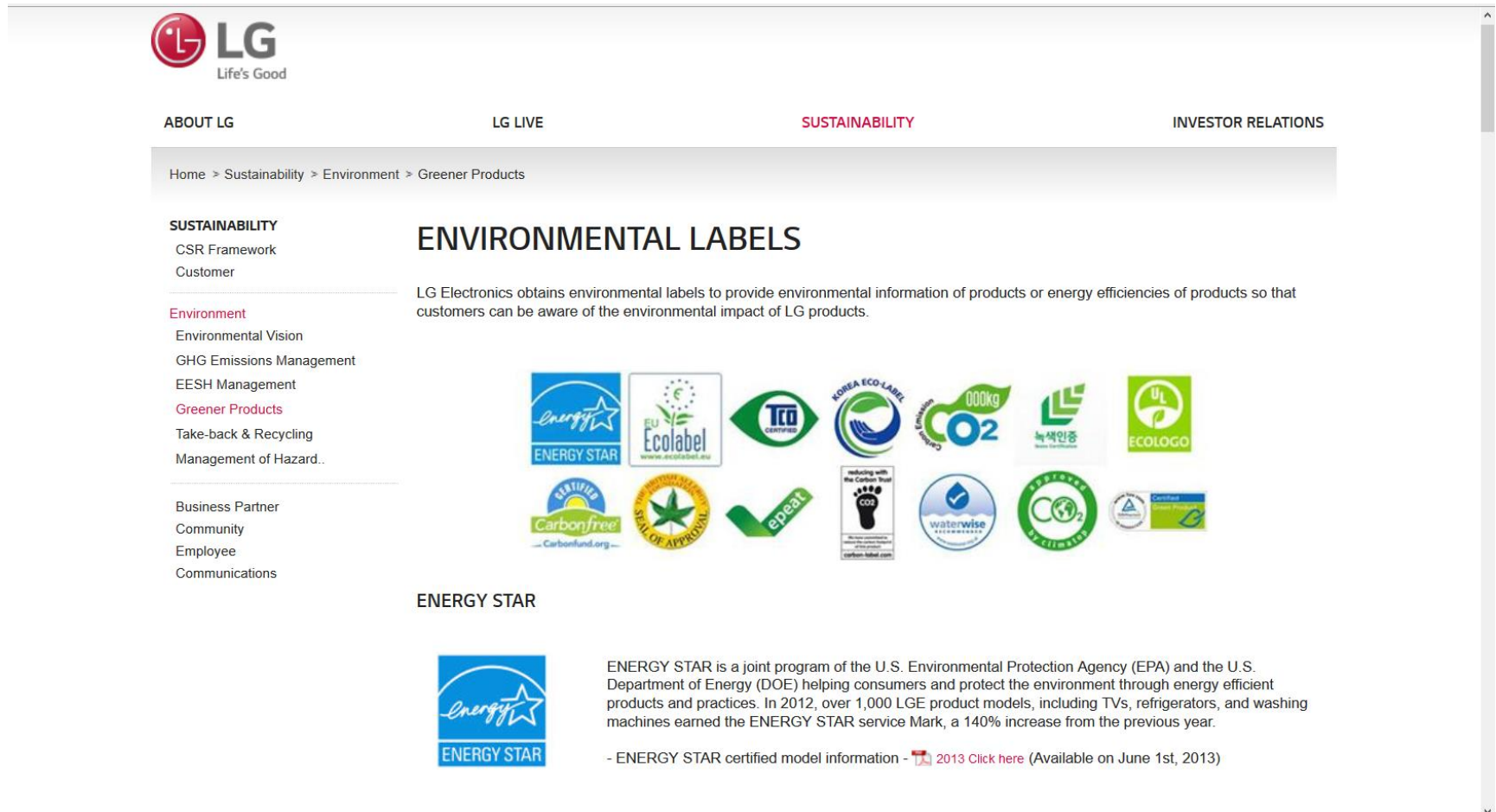


- 1 Stepwise evolution towards stringent standards
- 2 Broaden scope of standards to similar products
- Address embodied emissions by ...
 - 3a ... extending scope of existing standards
 - 3b ... building up new standards.

Source: Girod, B., Product-oriented climate policy: learning from the past to shape the future, Journal of Cleaner Production (2015), <http://dx.doi.org/10.1016/j.jclepro.2015.07.010>

Key challenge: Harmonization of environmental (carbon) product declaration

Example LG:



The screenshot shows the LG Sustainability page. The LG logo is at the top left. Navigation links include ABOUT LG, LG LIVE, SUSTAINABILITY (highlighted), and INVESTOR RELATIONS. A breadcrumb trail reads: Home > Sustainability > Environment > Greener Products.

SUSTAINABILITY

- CSR Framework
- Customer

Environment

- Environmental Vision
- GHG Emissions Management
- EESH Management

Greener Products


- Take-back & Recycling
- Management of Hazard..

Business Partner


- Community
- Employee
- Communications

ENVIRONMENTAL LABELS


LG Electronics obtains environmental labels to provide environmental information of products or energy efficiencies of products so that customers can be aware of the environmental impact of LG products.



ENERGY STAR



ENERGY STAR is a joint program of the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE) helping consumers and protect the environment through energy efficient products and practices. In 2012, over 1,000 LGE product models, including TVs, refrigerators, and washing machines earned the ENERGY STAR service Mark, a 140% increase from the previous year.

- ENERGY STAR certified model information -  [2013 Click here](#) (Available on June 1st, 2013)