The Top Runner and the Ecodesign Directive: what can we learn and how can we apply it in the construction sector?

Carl Dalhammar, Bernadette Kiss, and Erika Machacek
Content

• The Top Runner (Japan)
• The Ecodesign Directive (EU)
• Implications for buildings
• Link to public procurement

[Ecodesign Directive: Regulating resource efficiency]
The Top Runner (Japan)

• The Top Runners set the standards for MEPS

• The standard setting process is dynamic, with stakeholder input

• The standards are mandatory, but “fleet average”

• Compliance through “name and shame”

• Matched with public procurement, consumer information, labeling, retailer award scheme, and tax reductions for cars
### Table 1 Percentage of products meeting the Top Runner standard

<table>
<thead>
<tr>
<th>Product</th>
<th>Target year</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop computers</td>
<td>2005</td>
<td>90 %</td>
<td>100 %</td>
<td>100 %</td>
<td>100 %</td>
<td>100 %</td>
</tr>
<tr>
<td>Laptop computers</td>
<td>2005</td>
<td>88 %</td>
<td>89 %</td>
<td>100 %</td>
<td>100 %</td>
<td>100 %</td>
</tr>
<tr>
<td>Cars</td>
<td>2005</td>
<td>37 %</td>
<td>55 %</td>
<td>73 %</td>
<td>80 %</td>
<td>87 %</td>
</tr>
<tr>
<td>Air conditioners</td>
<td>2004</td>
<td>40 %</td>
<td>57 %</td>
<td>59 %</td>
<td>90 %</td>
<td>100 %</td>
</tr>
<tr>
<td>Refrigerators</td>
<td>2004</td>
<td>47 %</td>
<td>77 %</td>
<td>82 %</td>
<td>87 %</td>
<td>96 %</td>
</tr>
</tbody>
</table>

Source: Tojo (2005, p. 40, 42)
The Ecodesign Directive

• Cover energy-related products, excl vehicles
• Selection of aspects through life cycle assessment (LCA), yet focus is on energy efficiency
• Setting of requirements based on technical, environmental and economical analysis, benchmarking
• Apply least life cycle costs (LLCC), not Top Runner
• Extensive stakeholder consultation
• Enforcement is a Member State responsibility
• MEPS, not “fleet average”

• Coordination with EU energy labeling OK
• Coordination with eco-labeling and public procurement not OK
<table>
<thead>
<tr>
<th>Adopted implementing measures</th>
<th>Estimated savings (yearly by 2020)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standby and off mode losses of electrical and electronic equipment (household and office)</td>
<td>35 TWh</td>
</tr>
<tr>
<td>Simple set top boxes</td>
<td>9 TWh</td>
</tr>
<tr>
<td>Domestic lighting</td>
<td>39 TWh</td>
</tr>
<tr>
<td>Tertiary sector lighting (office and street)</td>
<td>38 TWh</td>
</tr>
<tr>
<td>External power supplies</td>
<td>9 TWh</td>
</tr>
<tr>
<td>Televisions</td>
<td>43 TWh</td>
</tr>
<tr>
<td>Electric motors</td>
<td>135 TWh</td>
</tr>
<tr>
<td>Circulators</td>
<td>23 TWh</td>
</tr>
<tr>
<td>Domestic refrigeration</td>
<td>8 TWh</td>
</tr>
<tr>
<td>Domestic dishwashers</td>
<td>2 TWh</td>
</tr>
<tr>
<td>Domestic washing machines</td>
<td>1.5 TWh</td>
</tr>
<tr>
<td>Fans</td>
<td>34 TWh</td>
</tr>
<tr>
<td>= 376 TWh</td>
<td></td>
</tr>
<tr>
<td>= 14% of the electricity consumption of the EU in 2009</td>
<td></td>
</tr>
</tbody>
</table>

Source: European Commission
Difference, Top Runner and LLCC

Source: Siderius and Nakagami 2013
Comparison EU-Japan

• Exact comparison of results difficult

• **Proposals:**
  
  • EU → adopt Top Runner as benchmark
  
  • Japan → MEPS, not “fleet average”
    
    → Stand-by, horizontal mandates
    
    → LCA, not just energy efficiency

US standards often very progressive!
Ecodesign Directive: Stricter energy standards

• Timescale and emerging technologies (e.g. LED), updates
• Learning curves (apply on LLCC)
• Setting requirements through several tiers into the future, and using checkpoints

• “Sufficiency standards”: Increased size would require new technology! Examples from labeling!
Instruments for energy efficiency: appliances

Current products & technologies
- MEPS
- Taxes & charges
- GPP & LCC
- Labeling
- Subsidies

Future products & technologies
- Technology procurement
- R&D, demonstrations

The International Institute for Industrial Environmental Economics
Lund University, Sweden
Ecodesign Directive and buildings

• Ecodesign Directive setting standards for windows, boilers, AC, lighting, water-related products, smart meters
  – Possibly insulation, lighting & heating controls

• Need to coordinate standards and measurement methods
  – ESD, EED, EPBD etc.

• Learnings from product policy?
Instruments for energy efficiency: buildings

EPBD
Building codes
ESD, EED, passports, TWCs, subsidies, taxes etc.
GPP & LCC
ESCOs
LEED etc.

Current products & technologies
Future products & technologies

Technology procurement
R&D, demonstrations

The International Institute for Industrial Environmental Economics
Lund University, Sweden
Windows

* Information on the most common U-values over time is based on interviews with window manufacturers and other professionals in or related to the window industry.
Before 1985 - subsidies

From the 1980s testing

1990-95 Technology procurement

Late 1990s first quality label

1998 – 2010 disrupted subsidies

Heat pumps
Role of public procurement

- GPP: Volumes and market creation, scale
- Technology (catalytic) procurement: New products and technologies, cheaper service offerings
- Functional and problem oriented procurement: radical solutions, address solutions that are not possible to fit into “categories” in law and labeling (e.g. IT solutions)
- Procurement can address environmental aspects that cannot be regulated
Directives and other instruments and tools

Voluntary agreements

Eco-labels
- ISO I-III
- TCO etc.

Procurement: Directives, case law, manuals, practices etc.

Eco-design

RoHS

Energy labeling
- Mandatory
- Voluntary

WEEE

REACH

Supporting standards
- Product/process /management /measurement etc.
- Mandatory, voluntary, semi-voluntary
- Harmonized, New approach, national, international

EPBD & CPRD

EEES Dir.

White certificates

Energy labeling

EPBD & CPRD

EEES Dir.

White certificates

Energy labeling

EPBD & CPRD

EEES Dir.

White certificates

Energy labeling

EPBD & CPRD

EEES Dir.

White certificates

Energy labeling

EPBD & CPRD

EEES Dir.

White certificates

Energy labeling
Potential product standards, examples

- Recycled content mandates
- Ban on material mixing, designs (e.g. coating)
- Offer consumer warranties, prove technical lifetime, guarantee spare parts
- Maximum disassembly time
- Maximum weight of components
- Banning substances, substance declarations/info
- Marking/labeling/tracing
EU – rules on recycling etc.

<table>
<thead>
<tr>
<th></th>
<th>min recovery</th>
<th>min recycling</th>
<th>collection rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaging</td>
<td>2008</td>
<td>60%</td>
<td>55%</td>
</tr>
<tr>
<td>Cars</td>
<td>2015</td>
<td>95%</td>
<td>85%</td>
</tr>
<tr>
<td>Electronics</td>
<td>2006</td>
<td>70%</td>
<td>50%</td>
</tr>
<tr>
<td>Batteries</td>
<td>2011</td>
<td></td>
<td>50% to 75% (efficiency)</td>
</tr>
<tr>
<td></td>
<td>2012</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tyres</td>
<td>2006</td>
<td></td>
<td>0 landfill of tyres</td>
</tr>
<tr>
<td>Biowaste diverted from landfills</td>
<td>2006</td>
<td></td>
<td>reduction to 75% of the 1995 level</td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td></td>
<td>reduction to 50% of the 1995 level</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td></td>
<td>reduction to 35% of the 1995 level</td>
</tr>
<tr>
<td>New targets (WFD)</td>
<td>2015</td>
<td></td>
<td>Separate collection: at least paper/metal/plastic/glass</td>
</tr>
<tr>
<td></td>
<td>2020</td>
<td></td>
<td>50% municipal waste</td>
</tr>
<tr>
<td></td>
<td>2020</td>
<td></td>
<td>70% construction and demolition waste</td>
</tr>
</tbody>
</table>
Advantages of legal standards, examples

- Political feasibility
- "Pave the way" for other policies
- Aid recycling practices & interact with recycling policies
- Economic benefits (socio-economic)
- Innovation & competitiveness

- Similar effects, EU and non-EU firms
Some major issues

- Delaying the process
- Data gaps. indicators
- Conflicts between environmental aspects
- Innovation & standard-setting
- Socioeconomic gains not equal to producer gains

- Need for supply chain measures

- Legal issues→ can we apply a preventive approach??? Design now to recycle in 15 years? Case of electric motors!!!
User patterns, political context

- Product use important when analyzing suitable legal standards
- Industry more open to some requirements than others