Maximising the Impact of Appliance Efficiency Policy with Digital Tools

CEM/SEAD and IEA Webinar series

2020-12-03

Peter Bennich, The Swedish Energy Agency

Swedish Energy Agency

Swedish Energy Agency: our *vision*

Assisting the society's transition to a sustainable energy system

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About the Swedish Energy Agency

- National authority for energy policy issues
- Subordinate to the Ministry of Infrastructure
- The Director-General is appointed by the Government
- Government funded
- Around 400 employees
- ISO 14001 (environment) and ISO 50001 (energy)

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Tasks

Statistics and policy analysis

Energy security

Research and innovation

Business development

Policy instruments

International collaboration

Energy efficiency measures

… on national, EU and international level

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Background

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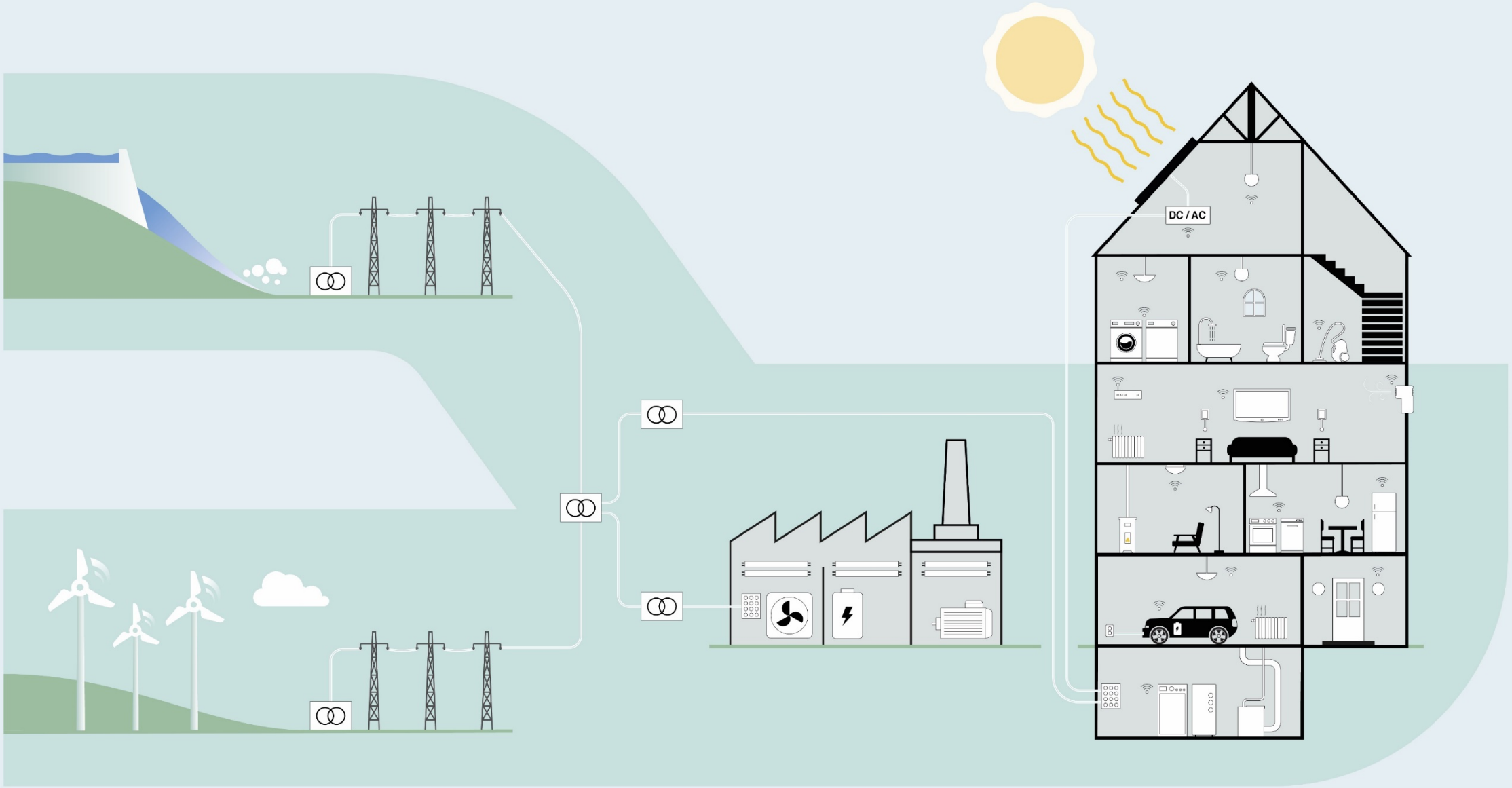
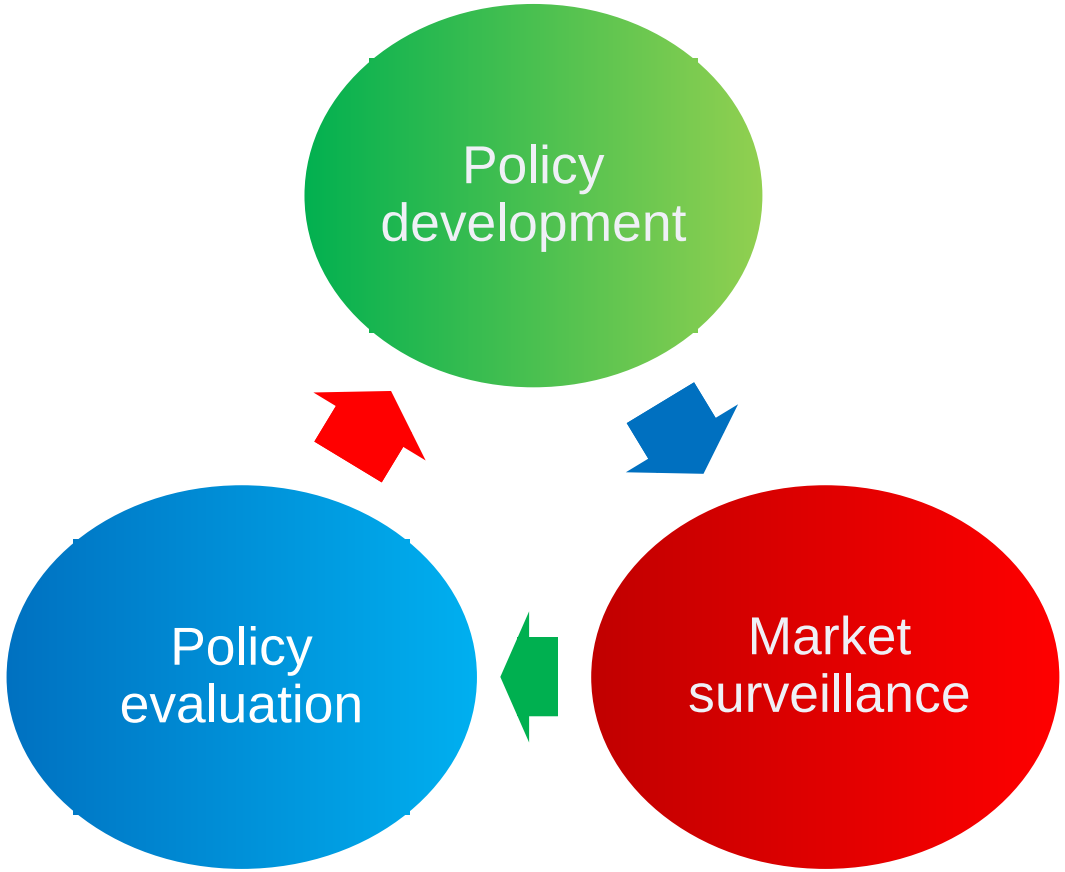
EU: Ca 40 products and systems regulated by MEPS & labels



Energimyndigheten

The SEA represents SE. Question: how to work effectively?



Constant loop between:

- *Policy development*
- *Market surveillance*
- *Policy evaluation*

Requires:

- *Technical analysis of products*
  - *In-house testing*
  - *External testing*
  - *Technical reports (public)*
- *Market assessments*
  - *Inspection*
  - *Commercial data*
  - *Technical reports (public)*
  - *Digital tools..!*

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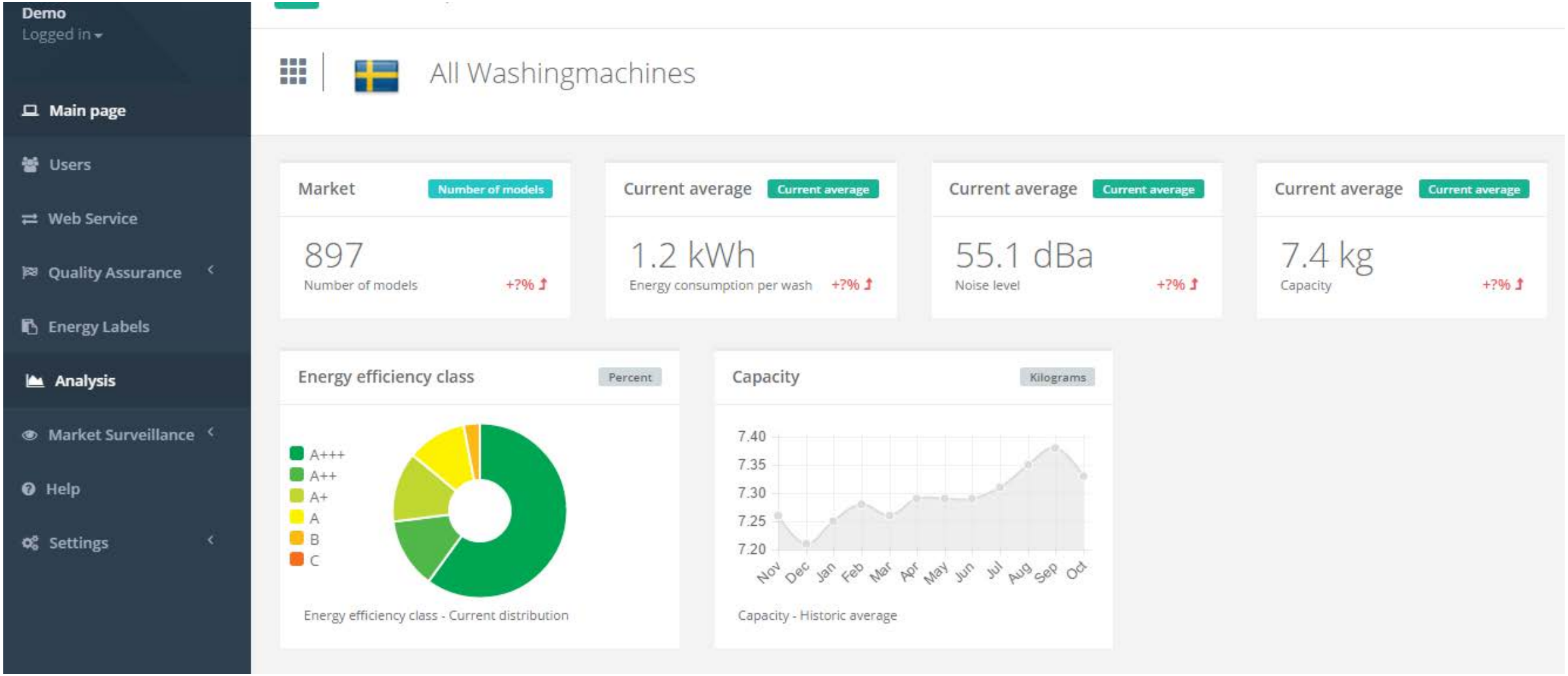
So what if… you could *watch* the market at *any* instant?



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Nordcrawl – a Nordic project to explore webcrawler as a tool for product policy development and market surveillance

- Development of a *software platform* for MV&E using web crawler data
- 5 Nordic *energy agencies* joint project
- Funded by the Nordic Council of Ministers
- Started in 2015
- *2020: 12 product groups, weekly crawls*

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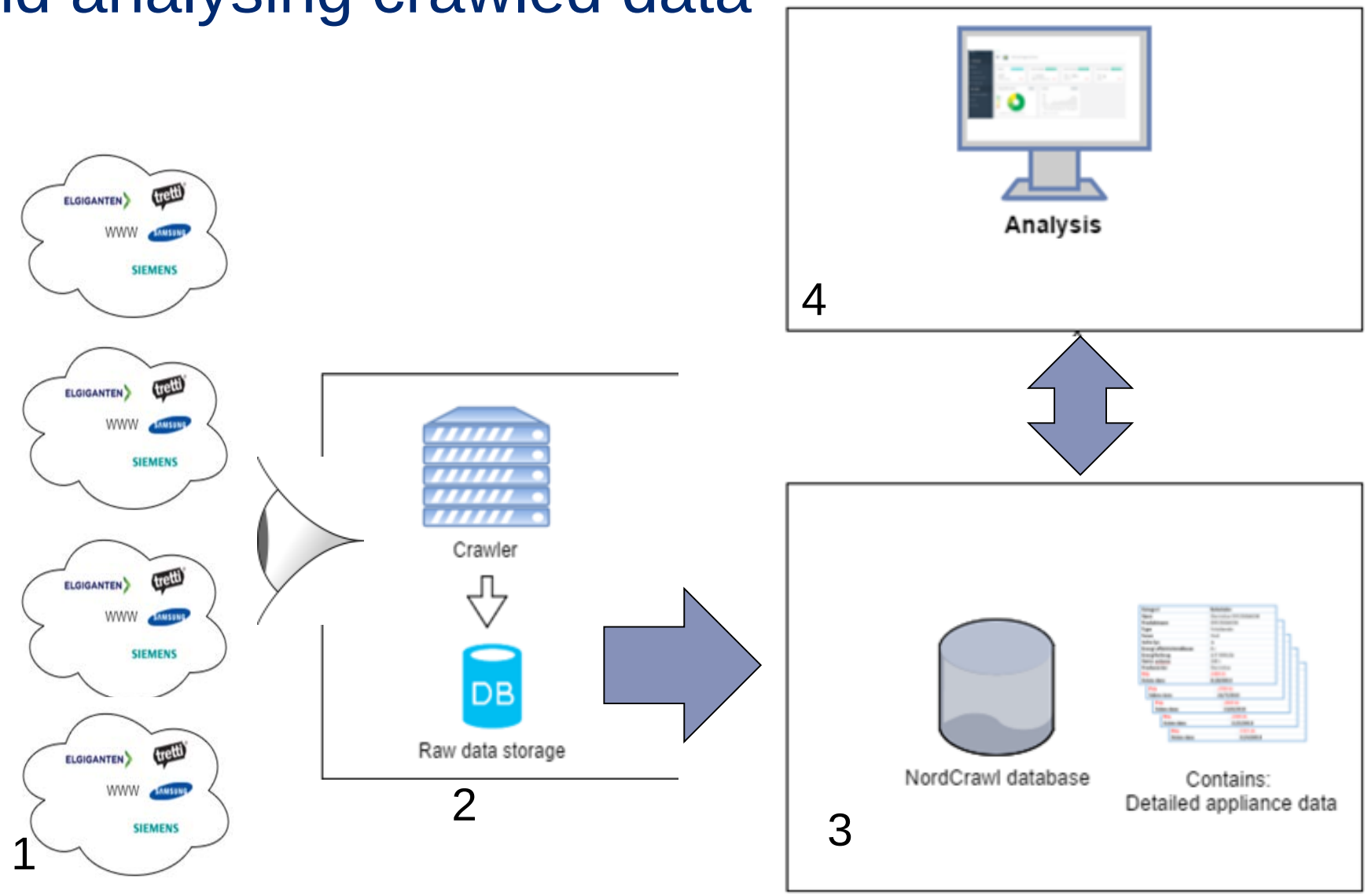
A sophisticated tool for cleaning, sorting, linking and analysing crawled data

1. Data on products, stored at various publicly available web sites.
2. The web crawler engine and a temporary *raw* data storage.
3. A product data base containing *processed* data.
4. The analysis module (a program), which access and display the data in various ways.



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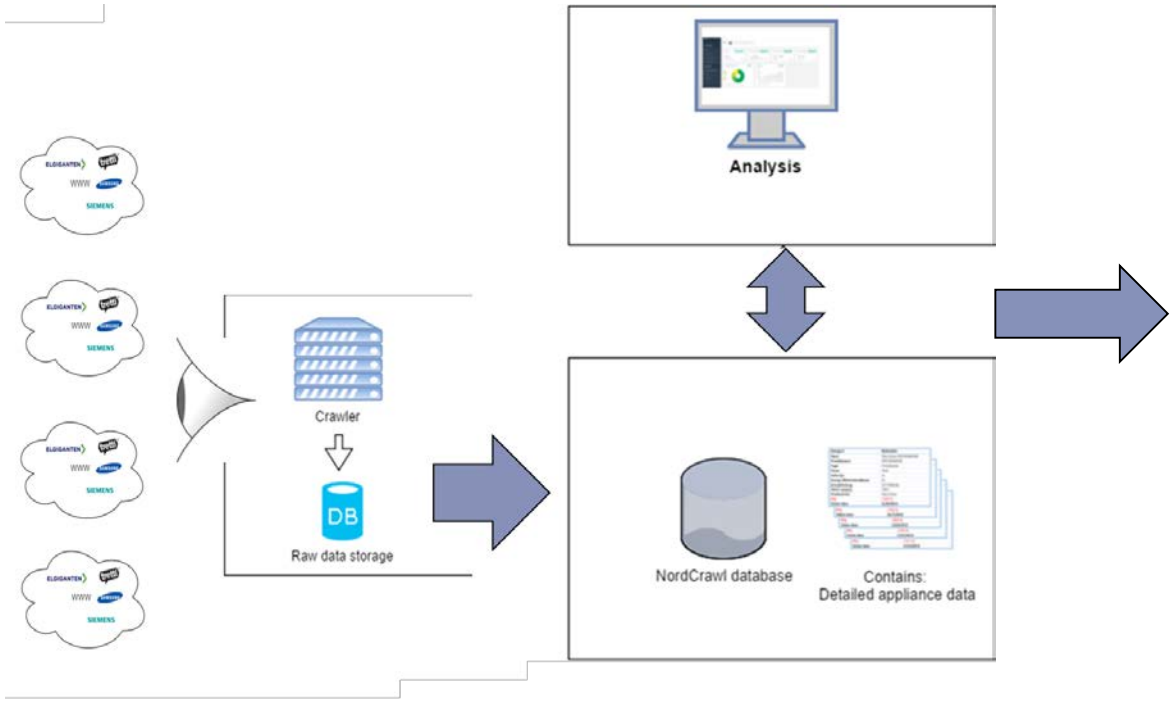
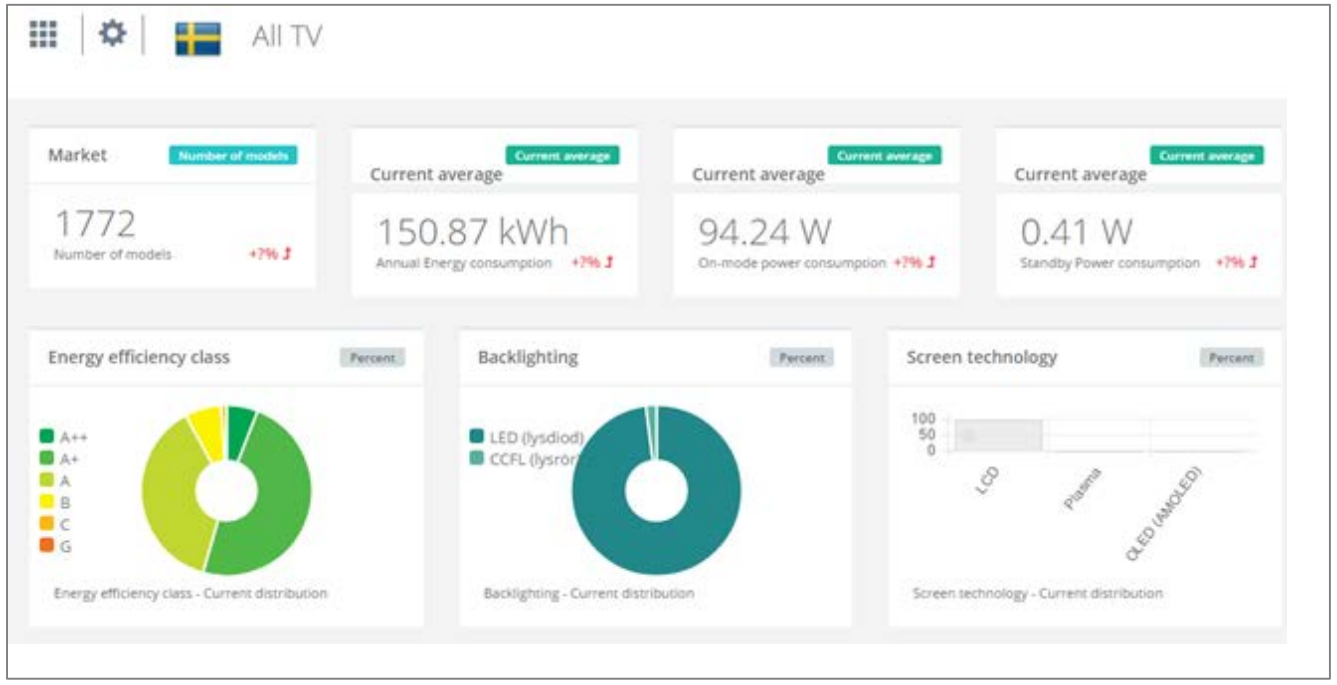
Provides enhanced knowledge for more effective policy development, market surveillance and evaluation





Market surveillance

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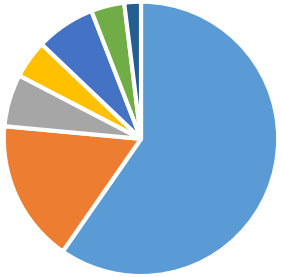
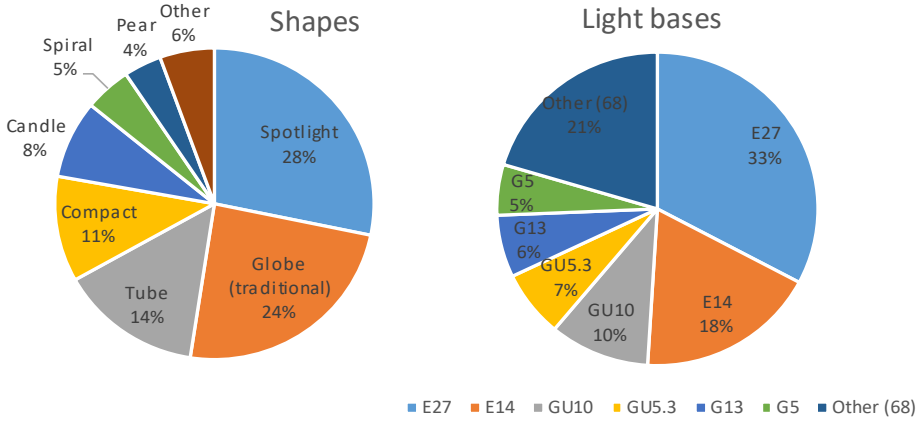
Sampling: accurate and effective

Information on the whole market:



→ *Whole market* compliance rates

Or sub-sectors/product characteristics:



→ Allowing focusing on *risk*

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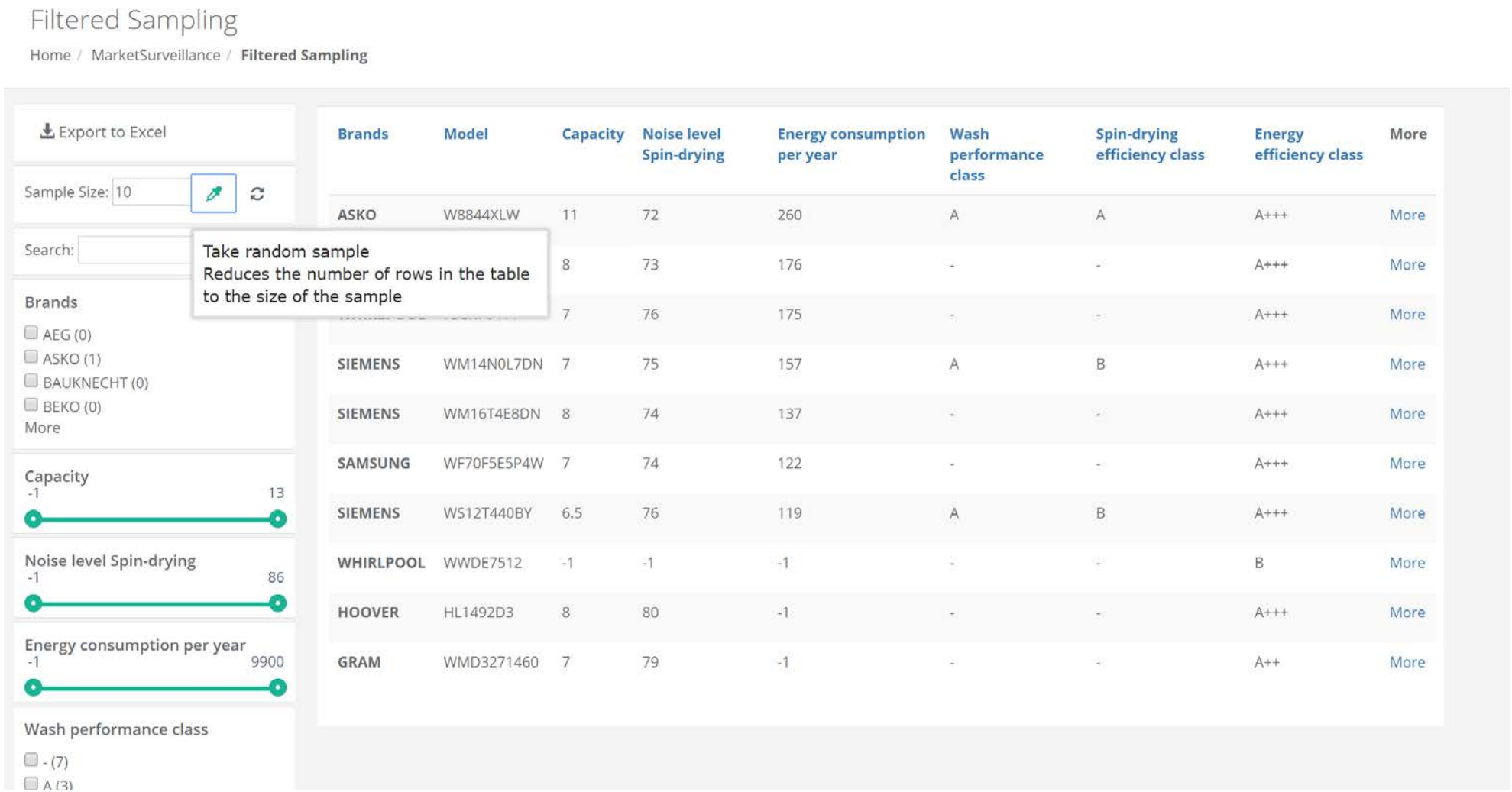
Example: random sampling of 10 washing machines



Brands	Model	Capacity	Noise level Spin-drying	Energy consumption per year	Wash performance class	Spin-drying efficiency class	Energy efficiency class	More
ASKO	W8844XLW	11	72	260	A	A	A+++	More
		8	73	176	-	-	A+++	More
		7	76	175	-	-	A+++	More
SIEMENS	WM14N0L7DN	7	75	157	A	B	A+++	More
SIEMENS	WM16T4E8DN	8	74	137	-	-	A+++	More
SAMSUNG	WF70F5E5P4W	7	74	122	-	-	A+++	More
SIEMENS	WS12T440BY	6.5	76	119	A	B	A+++	More
WHIRLPOOL	WWDE7512	-1	-1	-1	-	-	B	More
HOOVER	HL1492D3	8	80	-1	-	-	A+++	More
GRAM	WMD3271460	7	79	-1	-	-	A++	More

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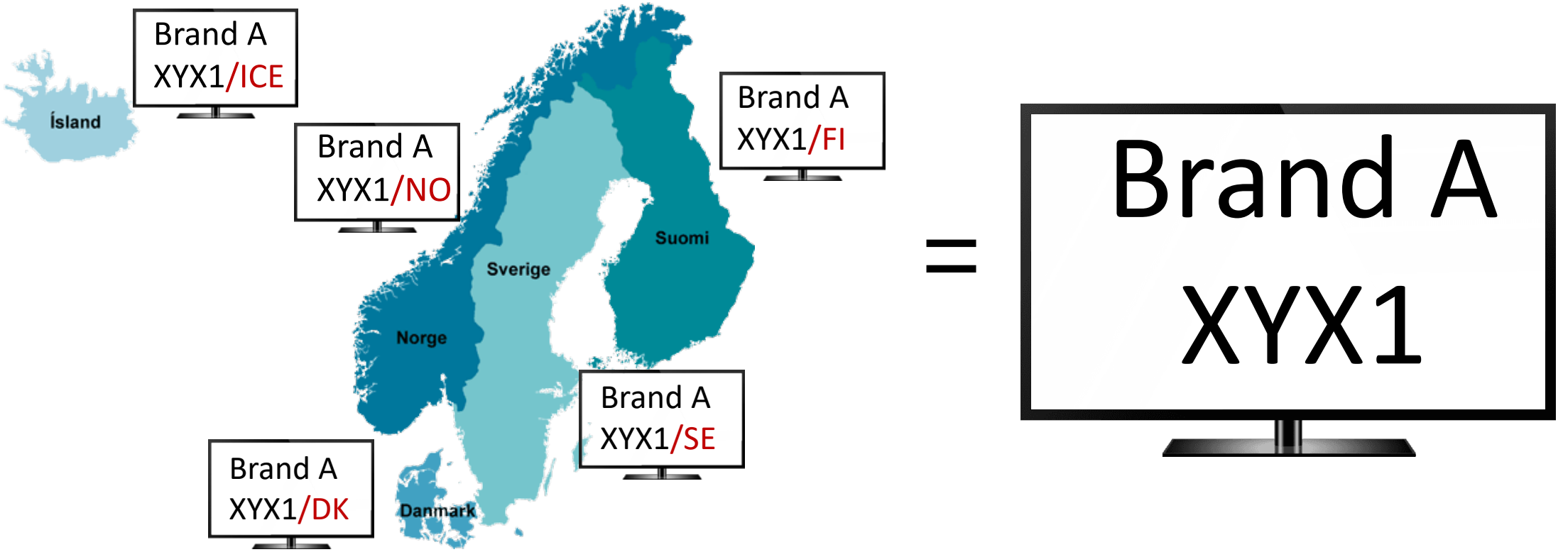
Easier recognition of the *same* models on the five markets



Enough to check for compliance of *one model* on *one market* -> more efficient market surveillance in the *whole region*

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Case study: Missing energy labels (1)

Purpose

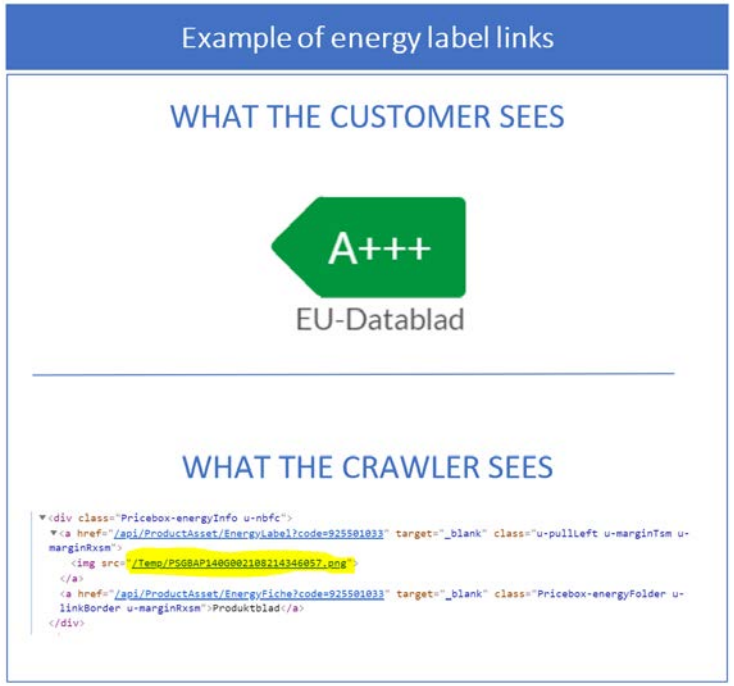
- Retailers have to comply with the Energy Labelling directives
- Find retailer product pages where the energy label is missing
- Get an overview of how it look at a product type level for each country

Missing energy labels (2)

Method

- Webcrawler extract energy label image-link/image-element
- Extracted like any other attribute

- Analysis => *Present* or *missing* label



Missing energy labels (3)

Results

- Calculate the

  Average non-compliance rate =

  (*Nr of pages missing energy label*) / (*Total nr of pages*)

- Best retailer = retailer with the *lowest* non-compliance rate
- Worst retailer = retailer with the *highest* non-compliance rate
- NB: Some of the retailers with high non-compliance rates are also missing other attributes and/or have other problems

Missing energy labels (4) – actual results

Refrigerator-Freezer			
	Avg non-compliance	Best retailer	Worst retailer*
Denmark	3,66%	Shop1 0%	Shop5 18,5%
Sweden	7,68%	Shop8 0%	Shop14 27,4%
Norway	2,22%	Shop19 0%	Shop22 3,0%
Finland	34,8%	Shop25 0%	Shop27 100%
Iceland	-	-	-

Refrigerator			
	Avg non-compliance	Best retailer	Worst retailer*
Denmark	9,50%	Shop1 0%	Shop6 28,9%
Sweden	11,64%	Shop11 0%	Shop14 29,0%
Norway	5,44%	Shop19 0%	Shop23 7,3%
Finland	18,6%	Shop26 0%	Shop27 100%
Iceland	-	-	-

Freezers			
	Avg non-compliance	Best retailer	Worst retailer*
Denmark	5,98%	Shop2 0%	Shop6 21,6%
Sweden	13,70%	Shop11 0%	Shop14 43,5%
Norway	1,36%	Shop19 0%	Shop21 1,7%
Finland	21,3%	Shop26 0%	Shop27 100%
Iceland	-	-	-

Non-compliance rates vary quite much and can be *high*

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MS summary:

Nordcrawl offers the market surveillance authorities (MSAs)…

- Reduced cost for data collection
- High coverage and a good representation of the market
- Data analysis in near real time leading to faster responses to potentially non-compliant products
- Snap shot and time based information on whole markets or specific segments improving sampling strategies, be it random or targeted
- Automated checks for potential non-compliance increasing human and financial resources availability to focus on areas of highest risk
- Opportunities for enhanced cross-border cooperation

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….i.e. an overall improved effectiveness of market surveillance

Policy evaluation

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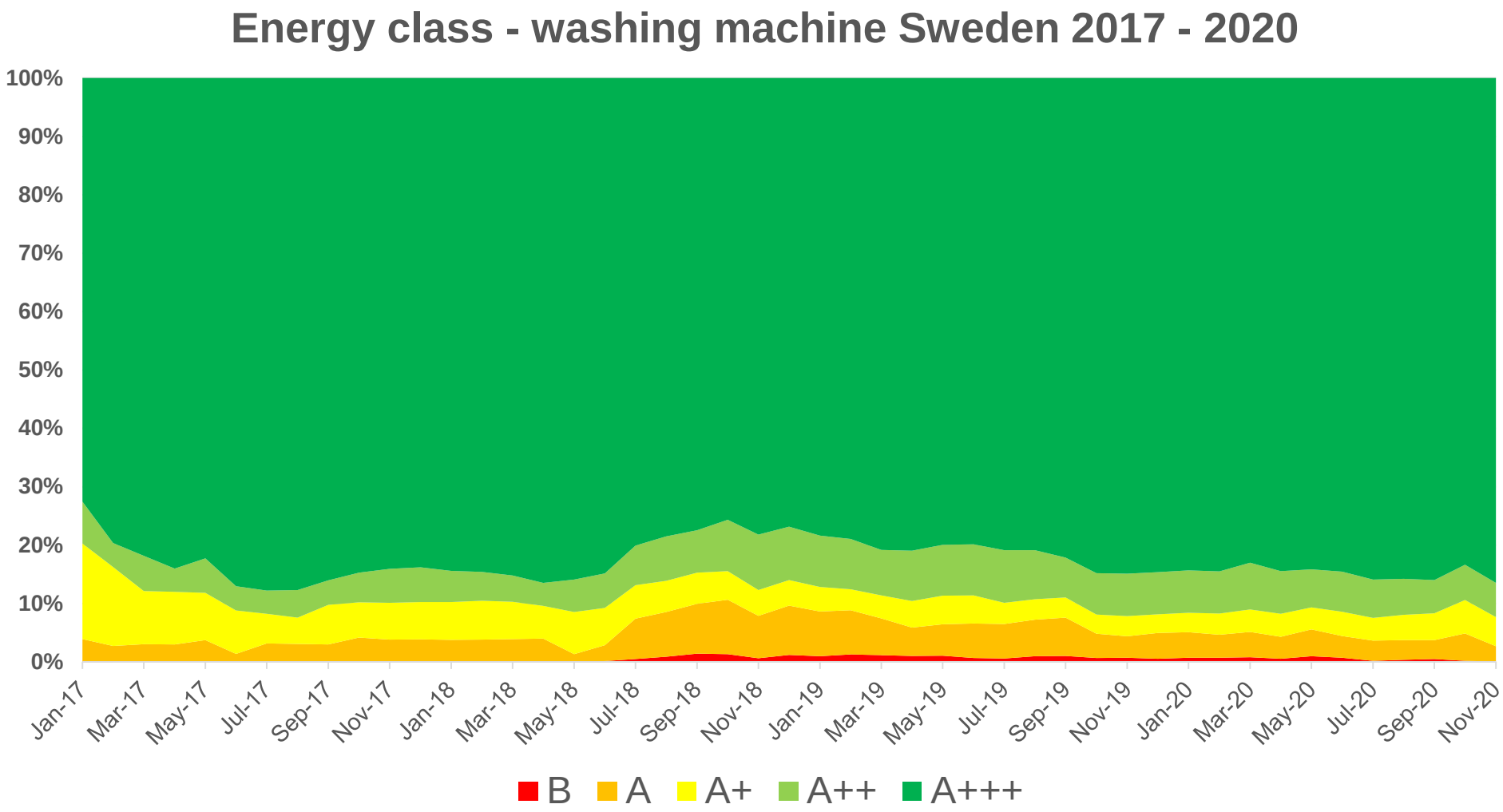
Trend analysis – *washing machines*



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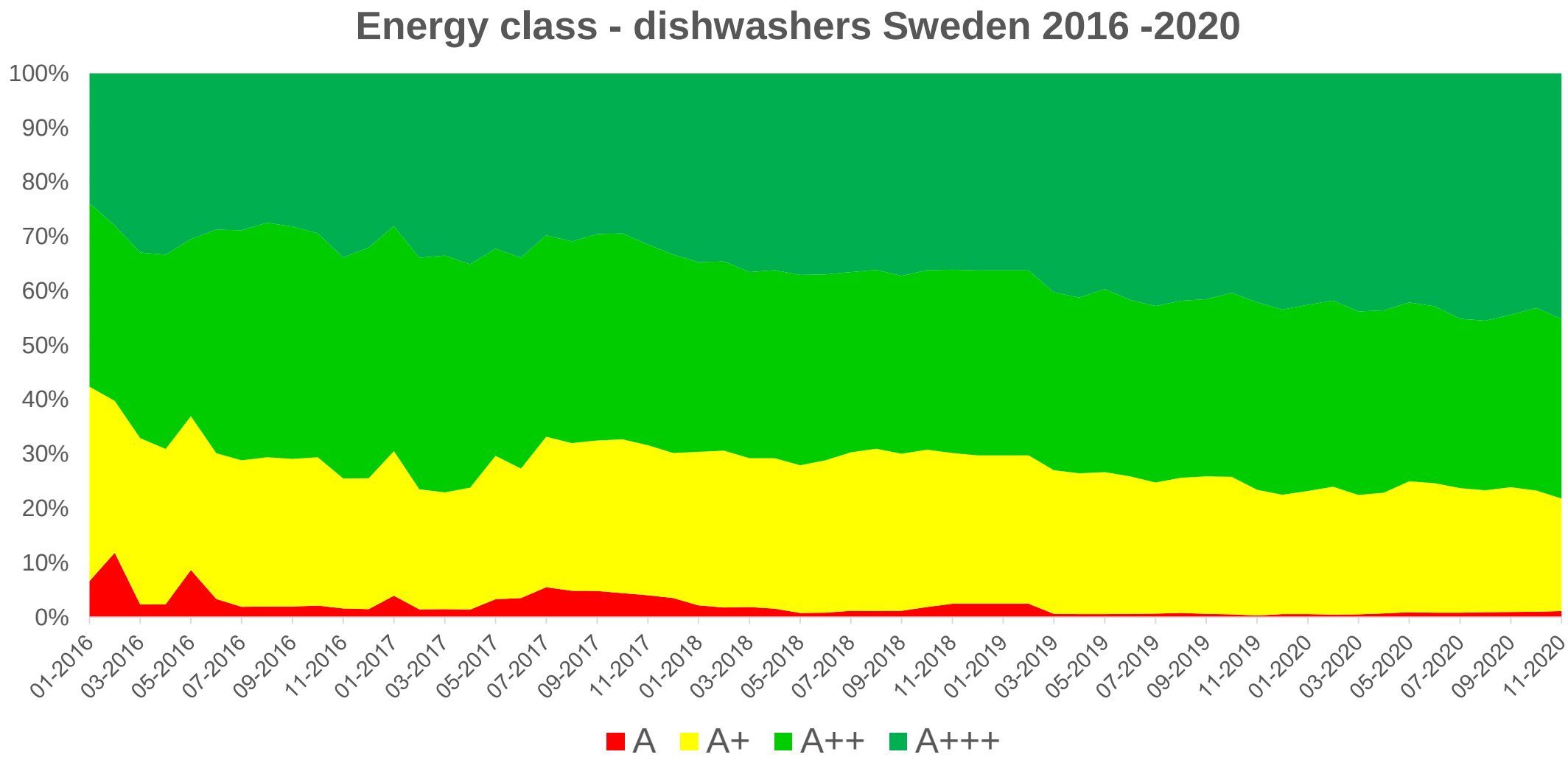
A+++ dominates. Bump at nov 2019 – why? Etc…

Trend analysis – *dish washers*



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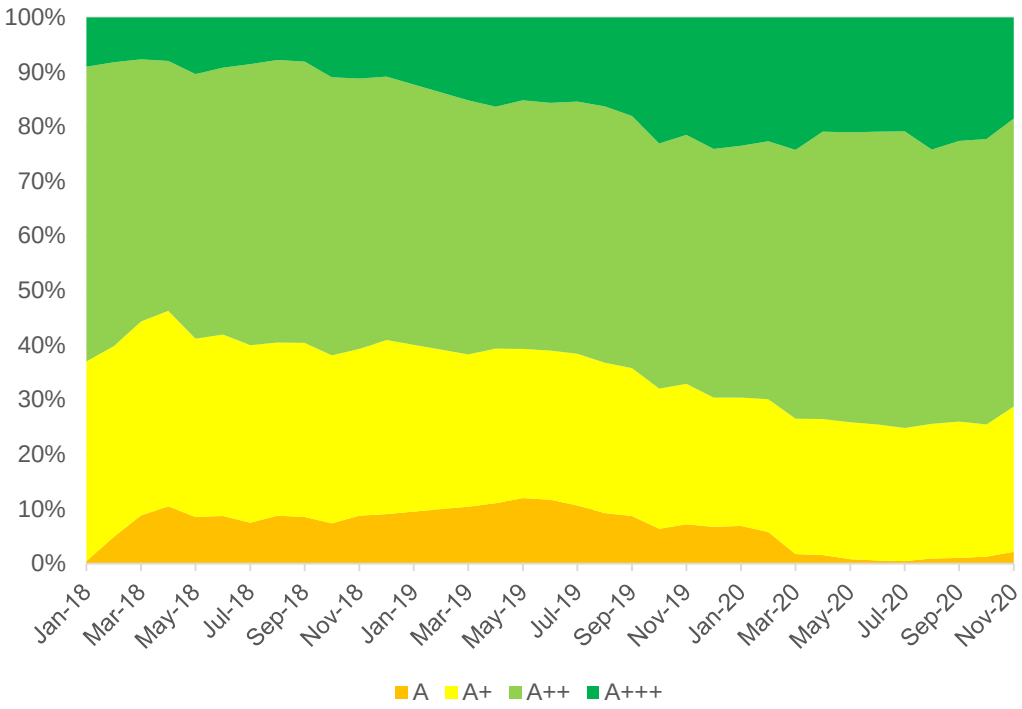
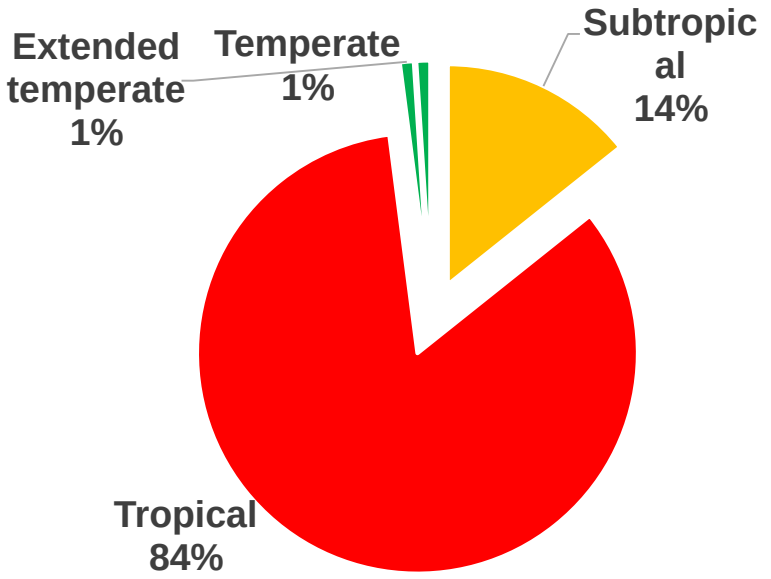
Somewhat larger spread in the higher classes.

Trend analysis – *refrigerator*

Refrigerators becoming more efficient… or?



… or is it because of more “tropical” fridges..??



Sometimes necessary to make a more in-depth analysis and go back to the scope and test standards: possible to label a fridge on the Nordic market as “tropical”...

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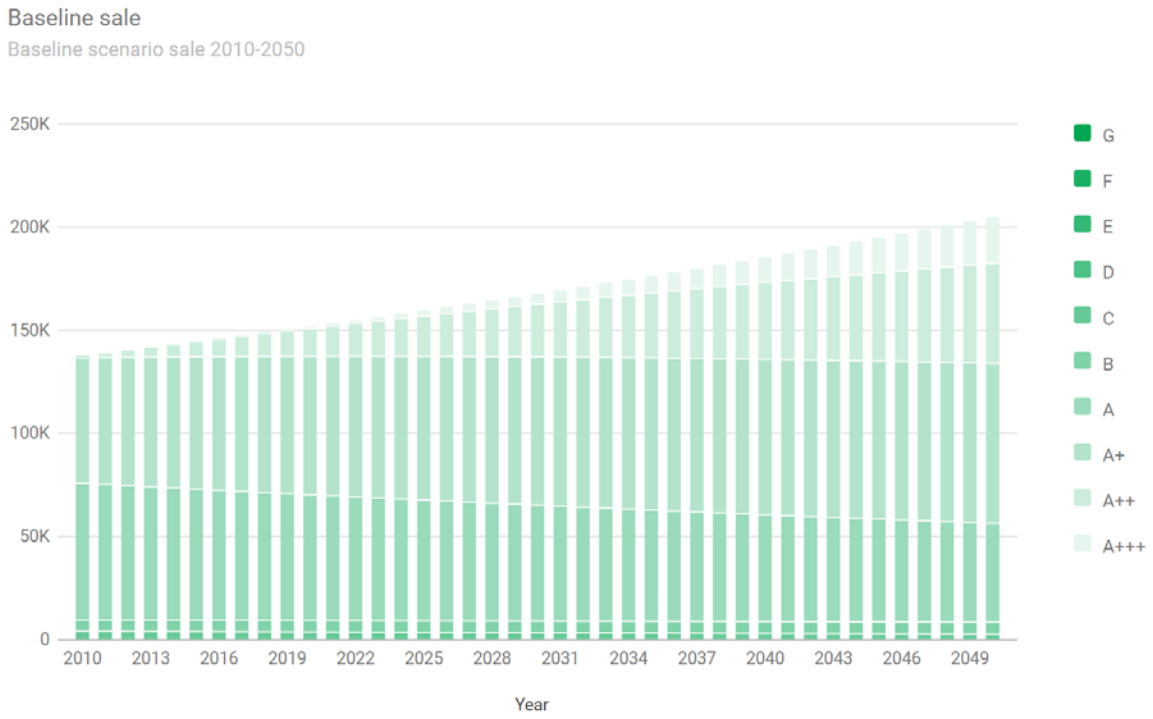
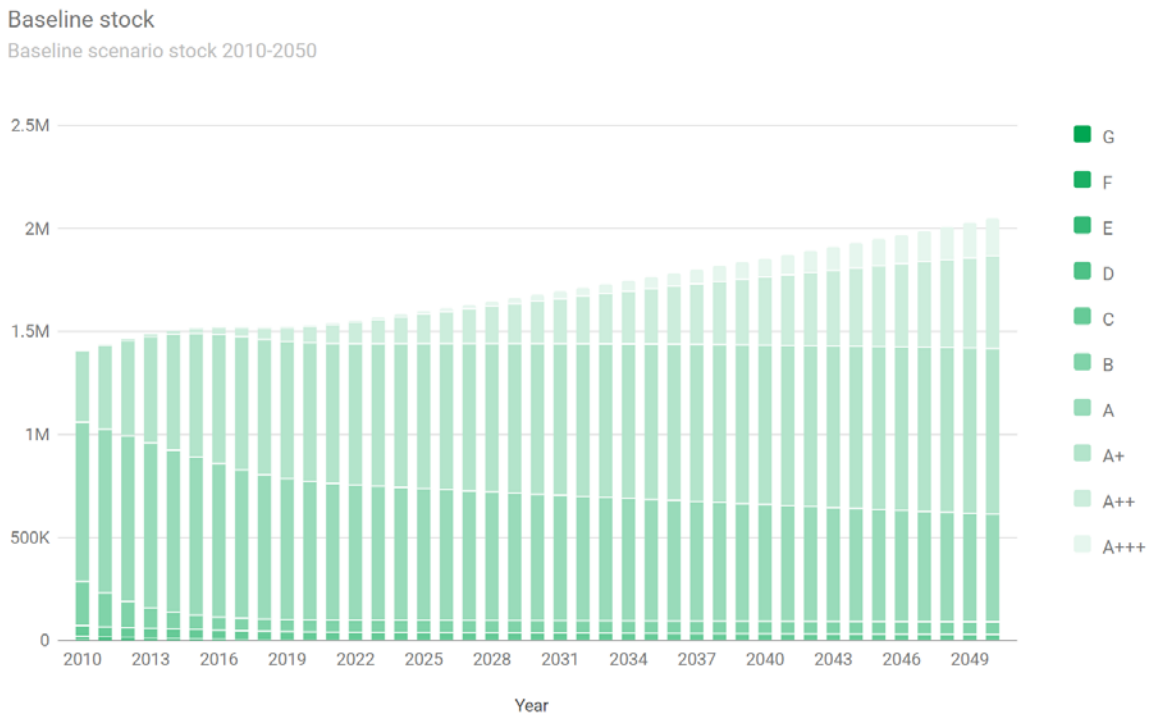
Assessment of savings vs BAU (1)





*On **sale** in BAU-scenario (crawled and processed data)*

*In **stock** in BAU-scenario (based on the sales data)*

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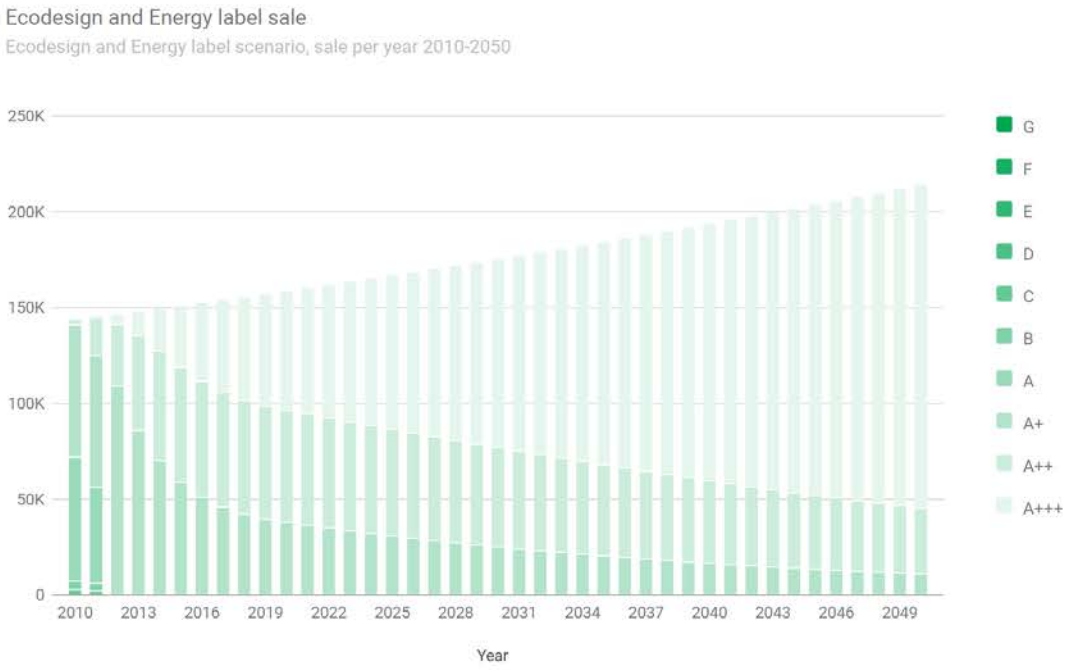
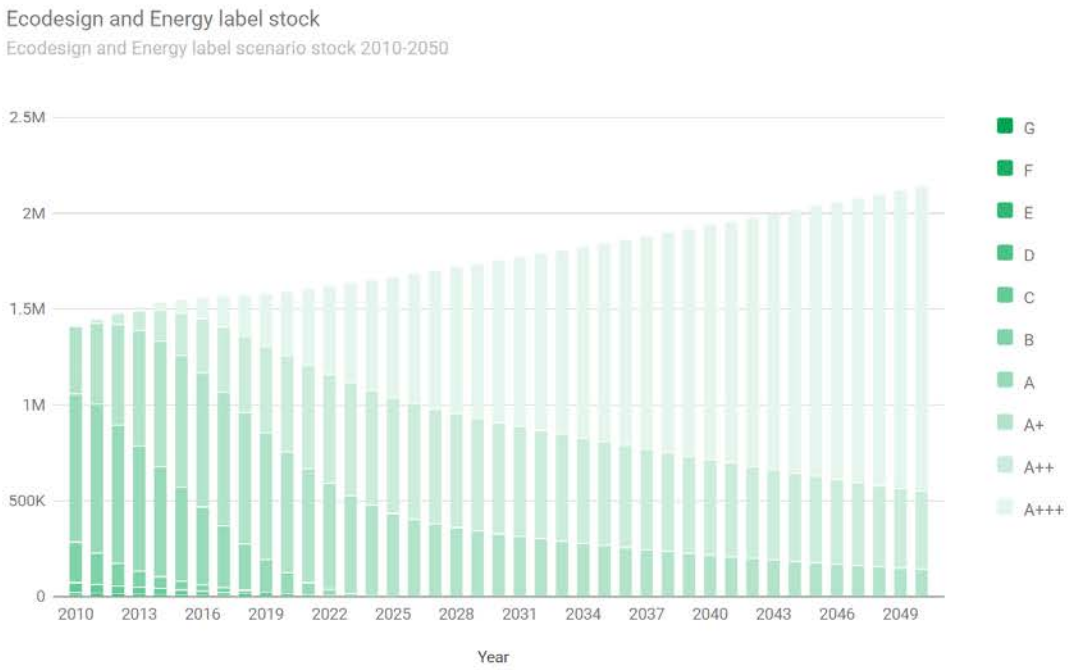
Assessment of savings vs BAU (2)





*On **sale** after MEPS & labels (crawled and processed data)*

In stock after MEPS & labels (based on the sales data)

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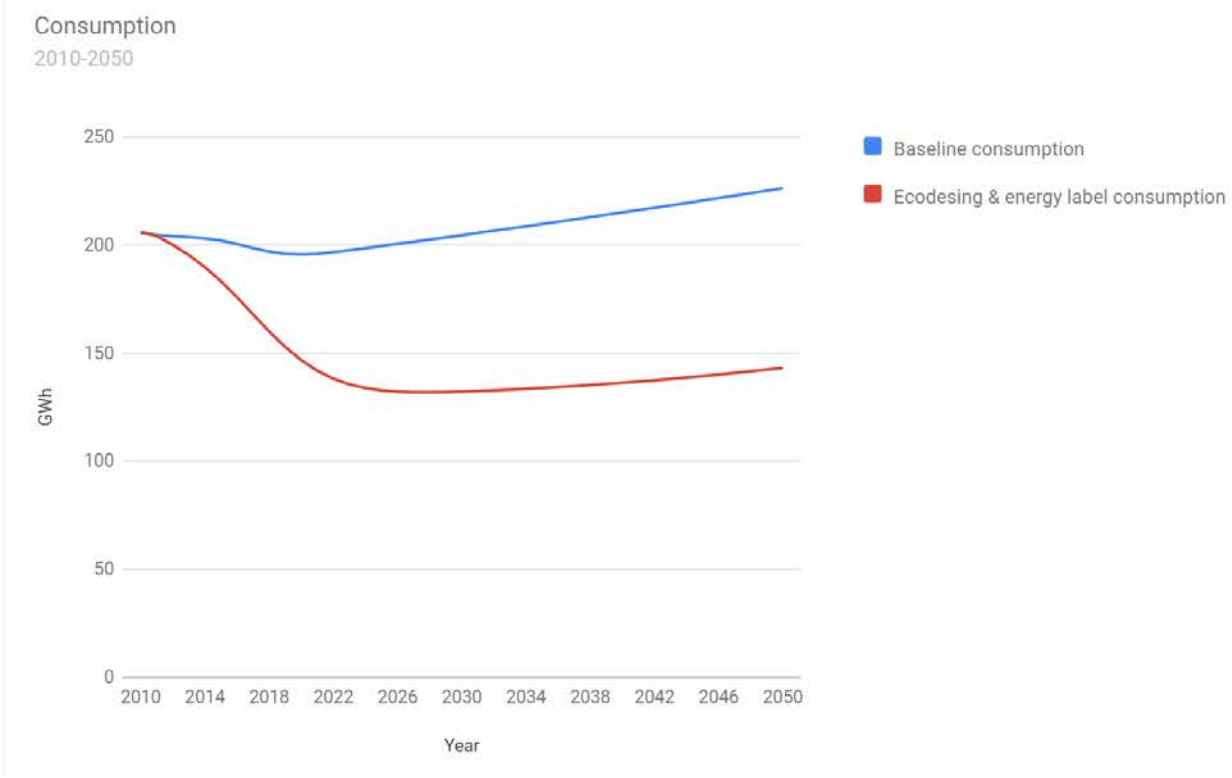
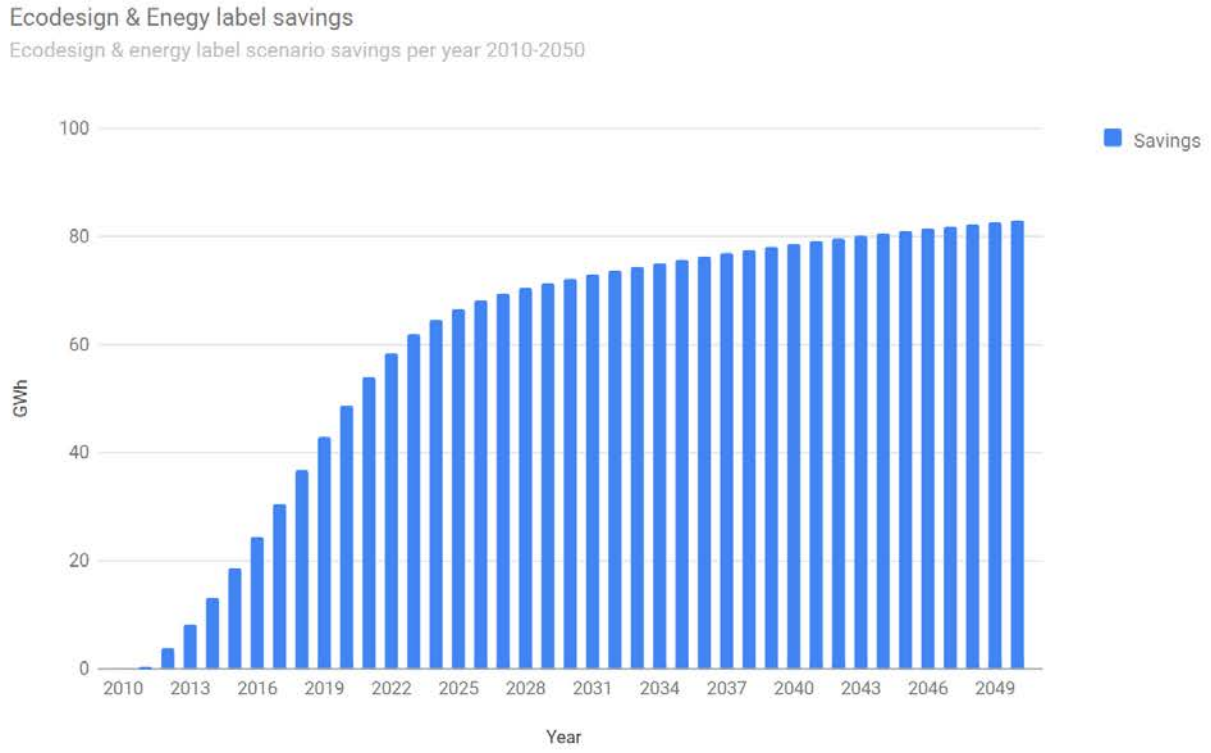
Assessment of savings vs BAU (3)





Possible to assess the accumulated savings on every market

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Policy evaluation summary:

Nordcrawl offers the policy makers (regulators)…

- Ex post evaluation of the policies:
- Not only for energy savings but also the reduction of the installed power in the stock – something becoming increasingly important
- To estimate the effects on product policies on the market(s) in *advance* -> better preparations before and more arguments during negotations
- The possibility to study the pace of adaptation of the policy: when does the market actually start to transform?
- Tools to detect anomalies and how to analyse them -> easier to correct unwanted effects or sustain wanted but unexpected effects
- For example, lost savings due to inefficient Market Surveillance can be estimated and used as arguments by MSAs

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….i.e. an overall improved effectiveness of the policies

Further development

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Future analysis

- Cost of EE
- How markets respond to sudden interventions of the market, such as campaigns, changes in the legislation etc
- Effect calculation module – real time assessments of energy savings due to ecodesign and energy labeling
- 2020: New energy label

Thank you!

Peter Bennich, senior adviser

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