



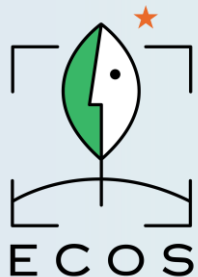
**Examining
shortcomings in test
methods and
practices for energy-
related products
post-Dieselgate**

**#greenstandards
@ECOS_Standard**

Pieter De Pous

ECOS President

European Environmental Bureau



Panel 1

Inadequate methods, modes and tolerances for energy- related products What we know so far



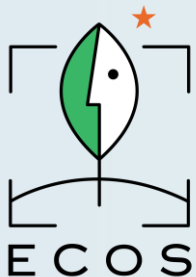
#greenstandards



Greg Archer

Clean Vehicles Director

Transport & Environment



#Dieselgate:

Lessons for product policy

21st June 2016, ECOS Annual Workshop 2016

Different products, same problem?

Brussels

Greg Archer

Transport & Environment

#DIESELGATE – VW THE TIP OF THE ICEBERG














500k diesel cars in US
11M diesel cars globally
VW Group
Renault / Opel and others
CO₂ tests
Gasoline vehicles
Defeat devices

Safety tests

EACH EUROPEAN INSTITUTION HAS DIFFERENT ROLES AND RESPONSIBILITIES IN VEHICLE TESTING AND APPROVAL

Power in Europe

Current vehicle standards

	Emission limits 	Test procedures 	Checks on vehicles 
Parliament			
Commission			
Member states			

THERE ARE MULTIPLE WAYS TO MANIPULATE TESTS

Common ways carmakers manipulate tests for CO₂ emissions and fuel economy

Disconnecting the alternator prevents the battery from charging, and reduces energy use.

LABORATORY

Carmakers can optimise the engine controls to reduce emissions.

LABORATORY

Careful lubrication and use of special lubricants help the car run more efficiently.

LABORATORY

Altering wheel alignment reduces rolling resistance

ROAD

Fitting special tyres with a lower rolling resistance.

ROAD

Overinflating the tyres reduces rolling resistance

ROAD

Using higher gears can allow the engine to operate more efficiently than normal.

LABORATORY

Taping over indentations or protrusions on the body reduces aerodynamic drag.

ROAD

Pushing the brake pads fully into the callipers reduces rolling resistance.

ROAD

LABORATORY

The rolling road is programmed with the minimum weight or inertia class.

LABORATORY



Laboratory instrumentation

LABORATORY



Optimising the test drive & Ambient conditions

LABORATORY ROAD

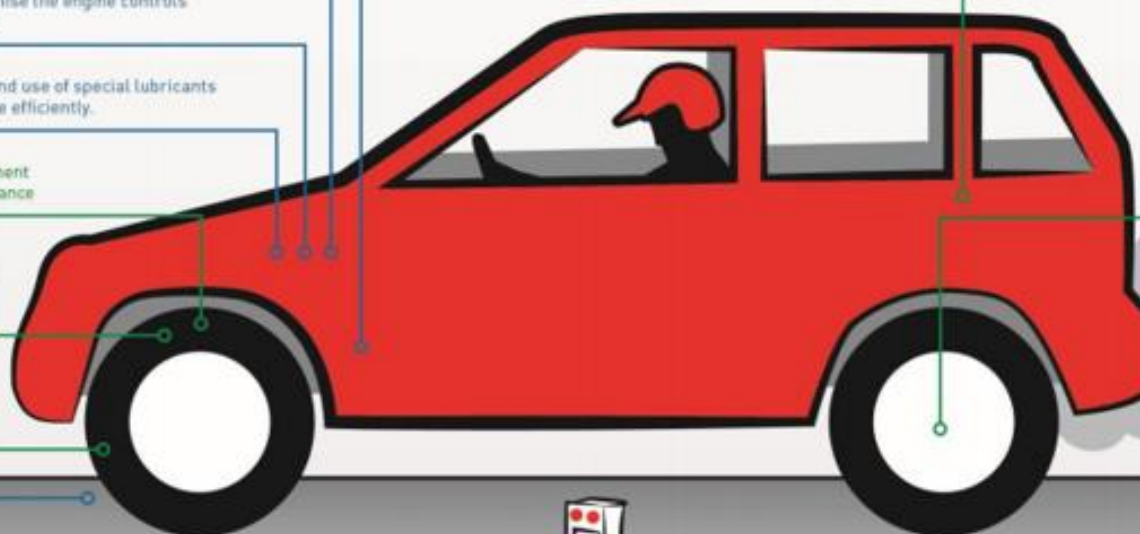


Taking advantage of test tolerances and Adjusting the results Header

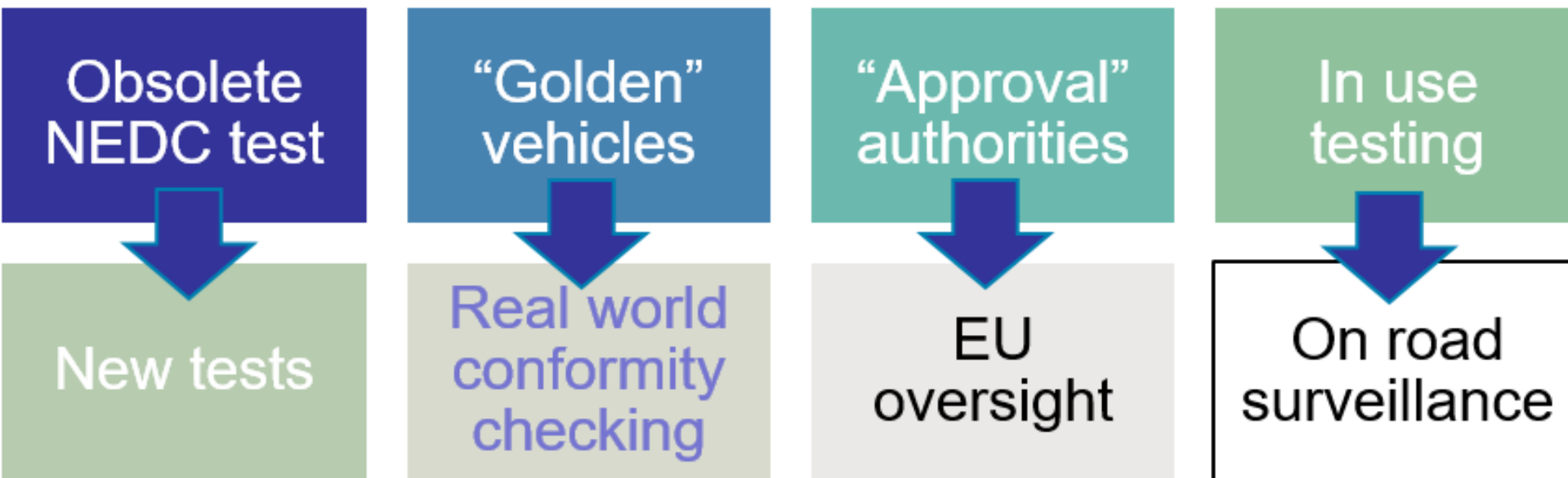
LABORATORY ROAD

CO₂ results declared by the manufacturer can be up to 4% below the actual test results.

LABORATORY



ISSUES WITH, AND SOLUTIONS TO, EUROPE'S FAILED SYSTEM OF TESTING



No backdoor
weakening

Extend on road
tests to CO2 and
all pollutants

Strengthen
Approval
Framework
Regulation

Levy to fund
market
surveillance

KEY MESSAGES

- 1** VW #dieselgate is the tip of the iceberg
- 2** In Europe vehicle regulations are systematically circumvented by ineffective tests and oversight
- 3** The solutions are known – better tests, improved oversight, effective market surveillance

Greg Archer

Director Vehicles & Energy

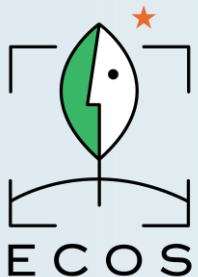
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Alan Meier

Associate Director

Energy Efficiency Center



(almost) Everybody Circumvents

Alan Meier

University of California, Davis

Disclaimer: These are my personal views

Examples

- **Cadillac**
- **Diesel engine manufacturers**
- **Japanese refrigerators**
- **Mini-split ACs**
- LG refrigerators
- Dishwashers
- Clothes washers
- Euro refrigerators in the 80s
- Tires on new cars
- Tire labels

How Cadillac Cheated on Emissions Control

- On-board computer was programmed to recognize emission test conditions, e.g., when AC & radio were off
- Outside of test conditions – radio/AC on – computer bypassed emission control device
- Actual emissions were worse than lab test



**EPA fined
Cadillac \$40M!**

A Few Years Later...

- US EPA changed rules so that it was harder to circumvent the test
- The manufacturers of diesel engines (for trucks) repeated Cadillac's strategy to illegally reduce tested emissions
- EPA discovered the violation

EPA fined the diesel manufacturers

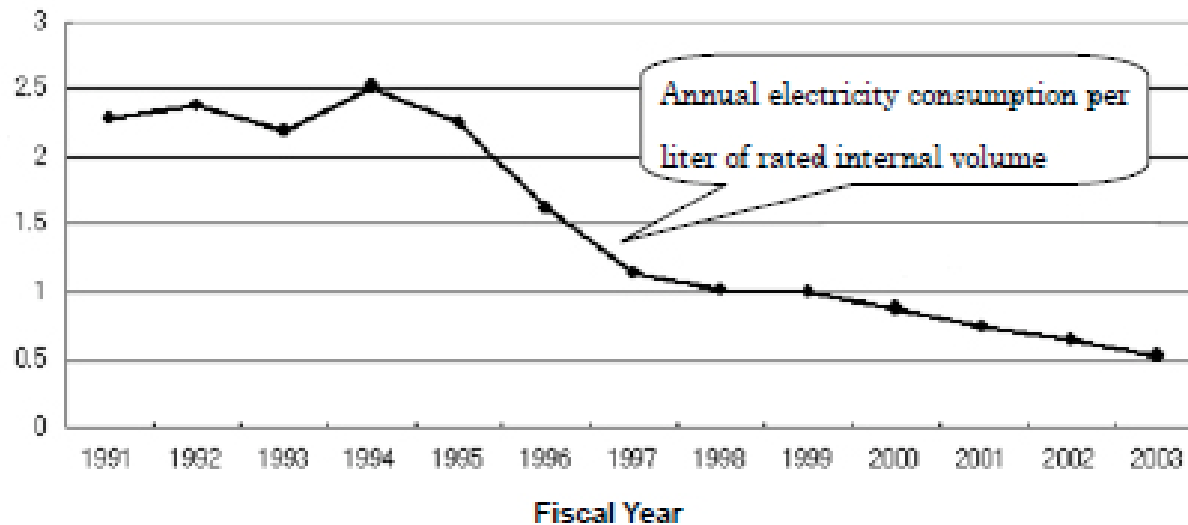
\$1 Billion!

Energy Efficiency of Refrigerators in Japan

(4) Improvements in energy efficiency of home electric appliances

1) Changes in energy conservation performance of freezers/refrigerators

Annual Electricity Consumption per liter (kWh/L)



Note) Rated internal volume and annual electricity consumption per 1 litre of rated internal volume are average values derived from the value of main refrigerator from each manufacturing company.

Source) The Japan Electrical Manufacturers' Association (JEMA)

Japanese Refrigerators circumvent test procedures

Comparison of field to lab measurements

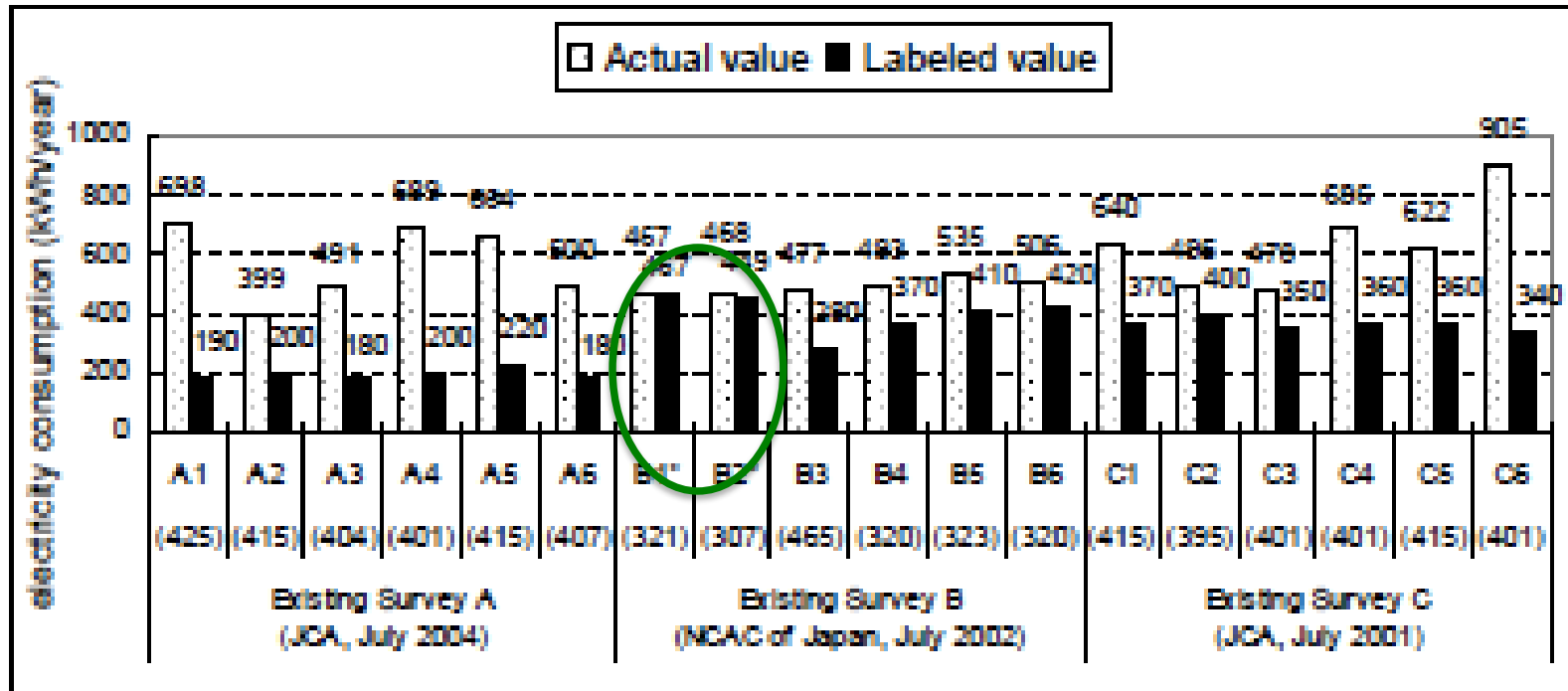


Figure 1. Examples of comparison of actual versus labeled electricity consumption of refrigerator-freezers

Source: [5], [6] and [7]

Note1: B1 and B2 are natural convection types made by European manufacturers. The others are forced circulation types made by Japanese manufacturers.

Note2: Value in parentheses refers to the rated volume.

European units

Types of Circumvention

- Outright lies
- Exploiting poorly designed test methods & labels (tolerances, reporting methods, ambiguities)
- Optimized products
- **Optimized behavior during test cycle** ← Today
- **Performance modified remotely by manufacturer after installation (SaaS*)** ← Future

* Software as a Service

The Policy Challenge

The cheapest way to reduce energy use and emissions is often through a combination of sensors, controls, and software

Unfortunately, these same features can also be used to circumvent

→ How do we encourage innovative energy savings and discourage circumvention?

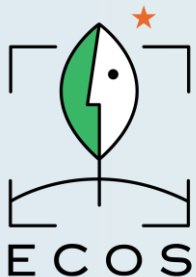
Solutions

- Institutionalize vigilance
 - Increase 3rd party measurements and field measurements
- New philosophies for test methods
 - Focus on software behavior
 - Emphasize field performance
 - Encourage “energy reporting” by appliances
 - Create a 2-part label, consisting of a simple lab test and compiled field measurements

Peter Bennich

Energy Efficiency Department

Swedish Energy Agency



A view from a MSA

21 June 2016

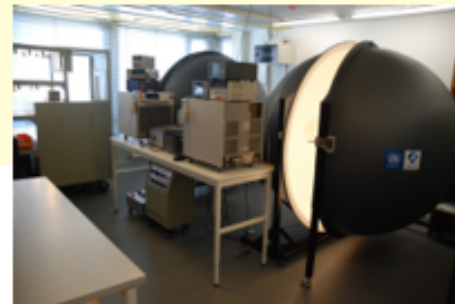
Peter Bennich

Swedish Energy Agency



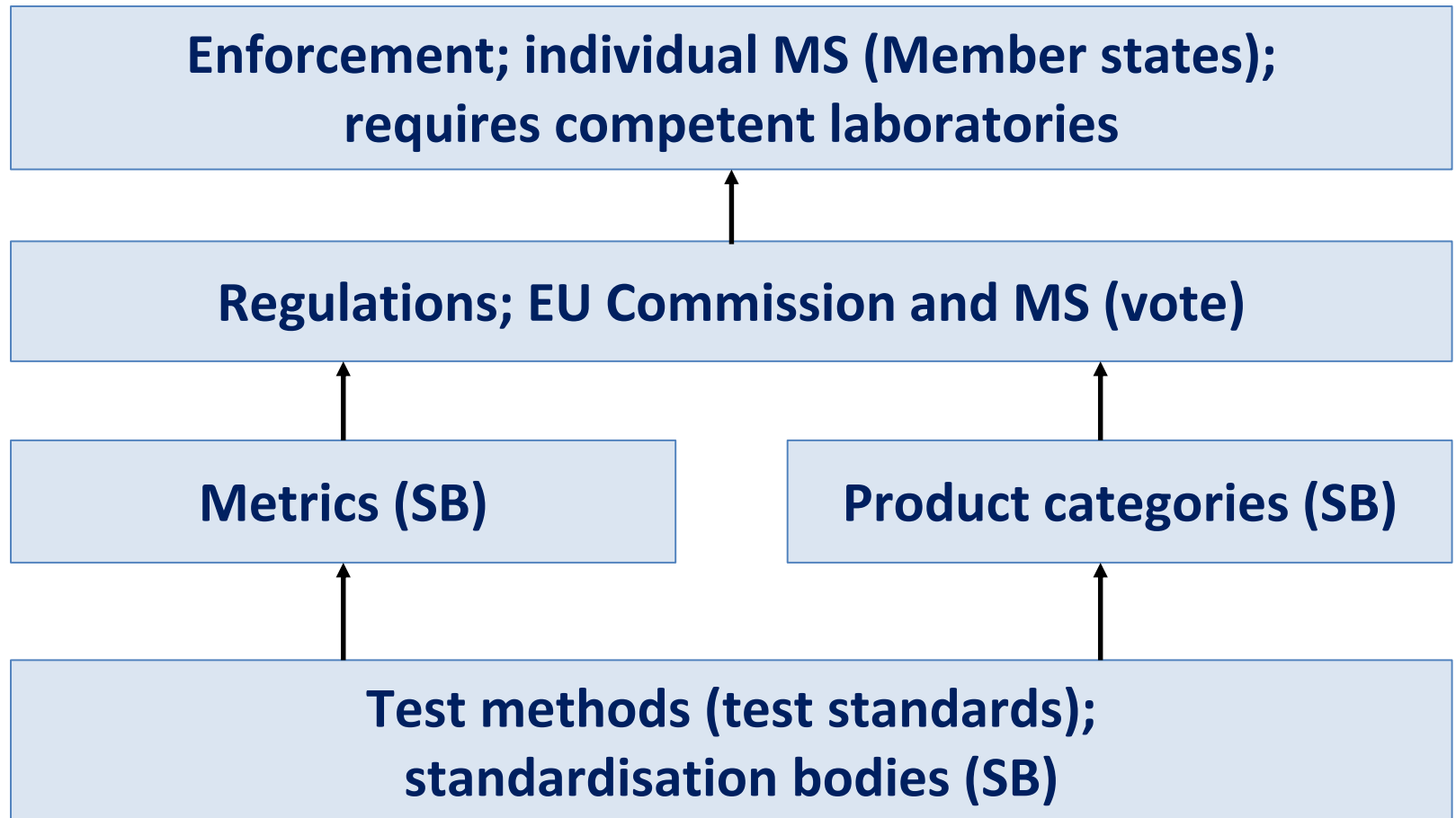
The Swedish Energy Agency

- National authority for energy policy issues
- Part of the government - sorts under the Ministry of Environment and Energy
- Resource efficient products:
 - Negotiations of Ecodesign and Energy labelling on behalf of the Ministry
 - MSA for Ecodesign and Energy labelling
 - In-house Test lab



4^E

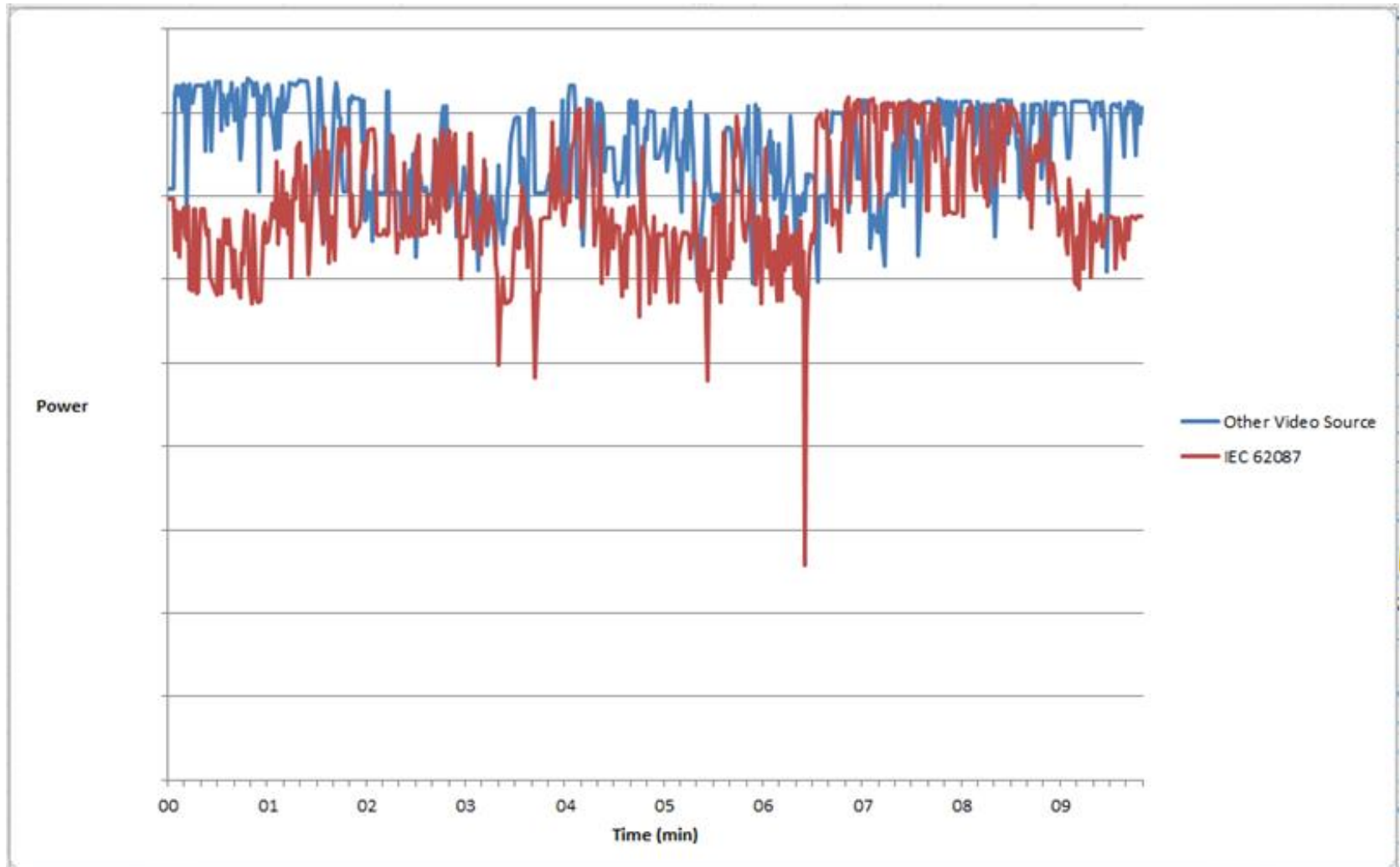
From Test Methods to Enforcement *(using the EU as an example)*



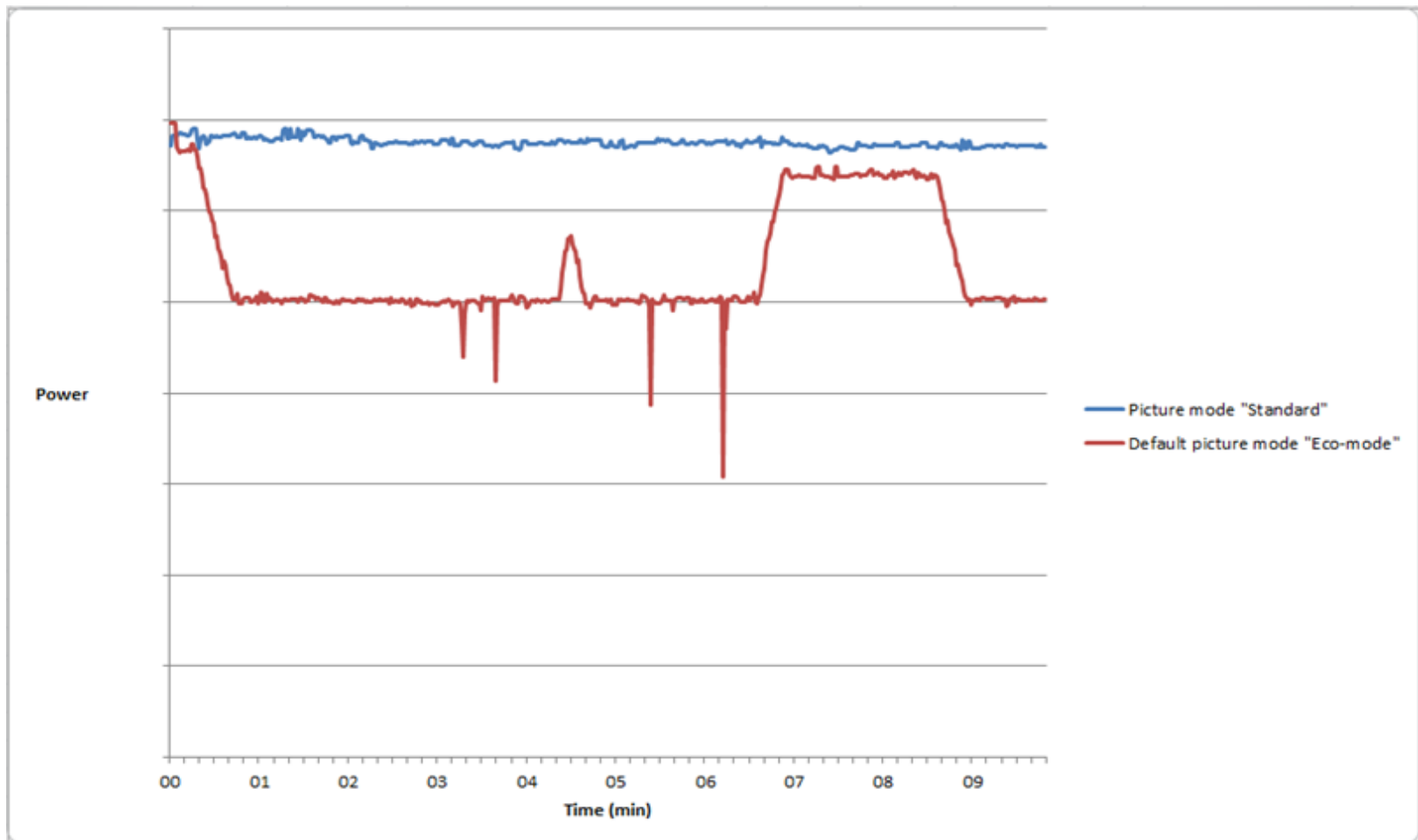
Two questions

- Has the Dieselgate scandal changed the way EU Member State authorities consider issues related to appliance testing?
- In your experience, what sectors or product categories show the most evidence of issues related to measurement (e.g. lighting?)

Typical TV: energy use when playing the normal film / standard film



2014: Defeat TV: energy use when playing the standard film in **normal mode** / **eco mode**



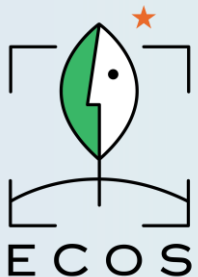
Answers (and more questions...)

- Much more focus on the need for proper test standards and better understanding of the test results:
 - Must think broadly and always in a policy context
 - More collaboration – gov-gov; gov-NGO etc
 - Better understanding of that this requires resources
- Smart appliances – or smart functions - pose a challenge in particular:
 - Metrics? "Intelligent efficiency" etc
 - Test standards? Smart and/or Connected devices etc
 - Very fast innovation and development speed... How do we keep up?

Viktor Sundberg

Vice President Environment and European Union

Electrolux



Panel 2

Towards a better coordinated, inclusive and efficient Ecodesign process

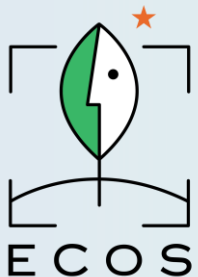
#greenstandards



Christoforos Spiliotopoulos

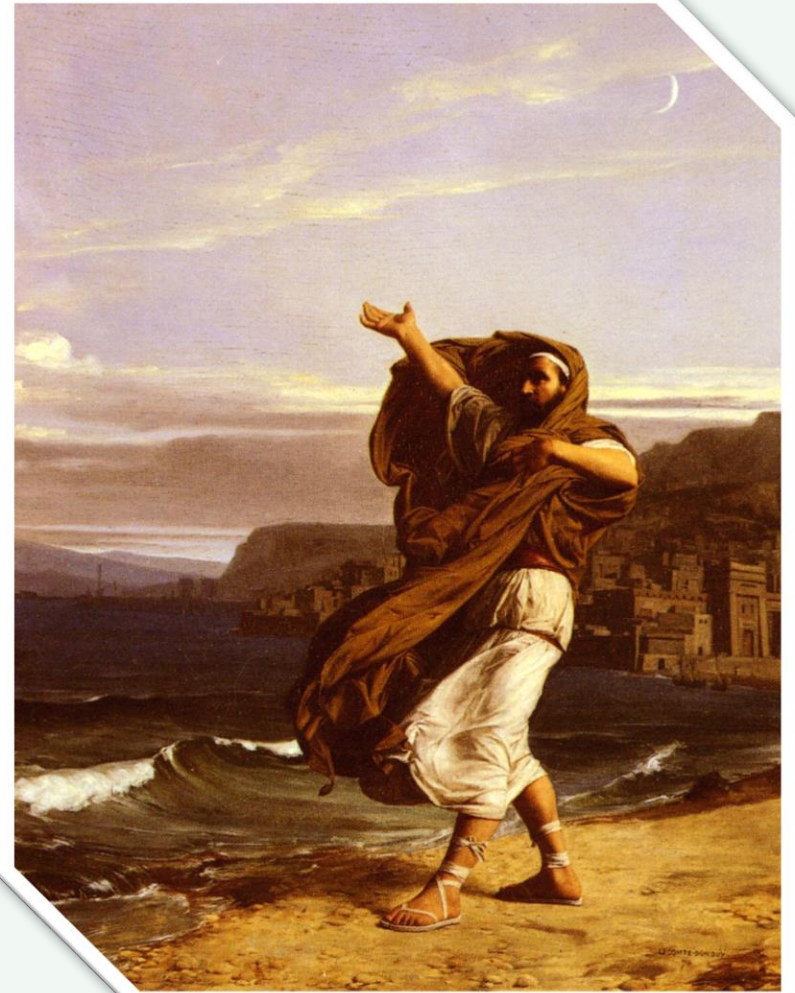
Senior Policy Officer

ECOS



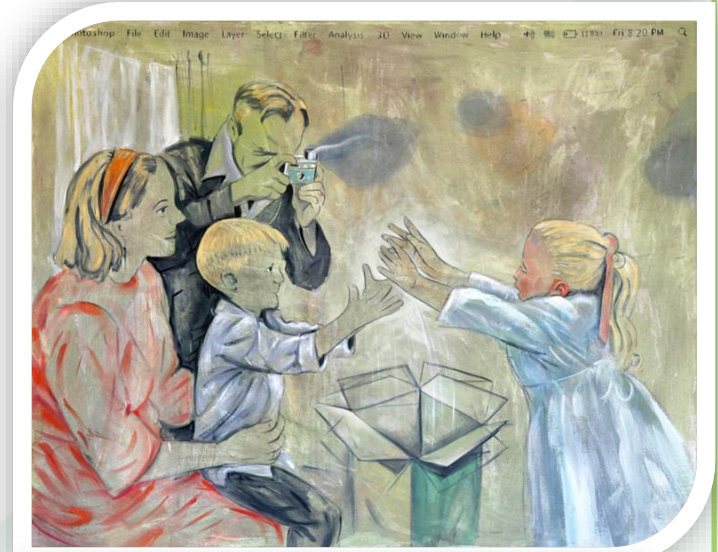
Product testing and energy savings

- Collection of experiences
- Ecodesign focus
- Consequentialist approach



Mirroring reality?

- Appliances alone do not bring about energy savings
- Tests that mirror reality instead of reality mirroring laboratories.
- Defeat devices is only a sub-category of circumvention



Political discussions in technical coating

- Boundaries between Ecodesign regulation and standardisation
- Transparency and inclusiveness
- International dimension

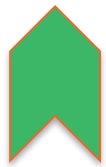


Towards a stronger process



Is the method repeatable and reproducible?

- Does the method describe real-life conditions and representative operation of the product



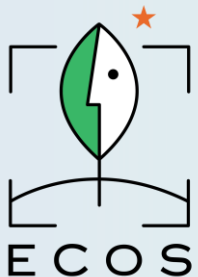
Is the method compliant with regulatory and mandated requirements?



Robert Nuij

Head of Sector
Energy Efficiency of Products
DG Energy

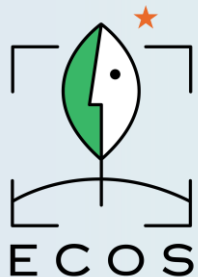
European Commission



Michał Zakrzewski

Smart Living & Competitiveness Director

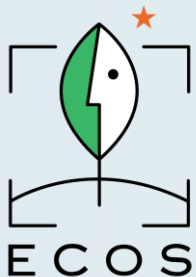
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Denis Pohl

Health, Food Chain Safety and Environment

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Director

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