Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of the Environment,
Transport, Energy and Communications DETEC

Federal Office for the Environment FOEN

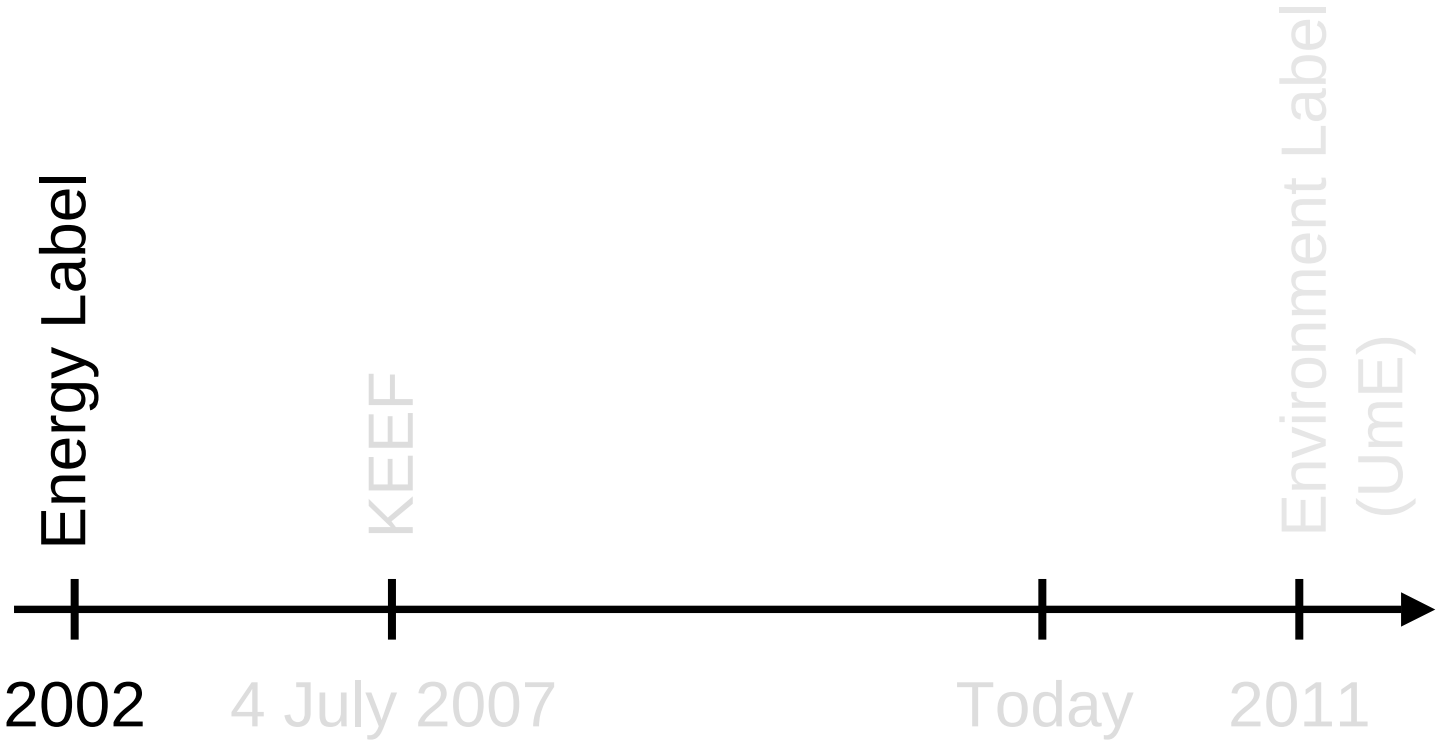
Energy efficient and low emission vehicles

22 June 2010 - LCA FORUM - DF 41

Timeline


KEEF
Environment Label
Umweltetikette (UmE)
Energy Label
2002
4 July 2007
Today
2011

Timeline

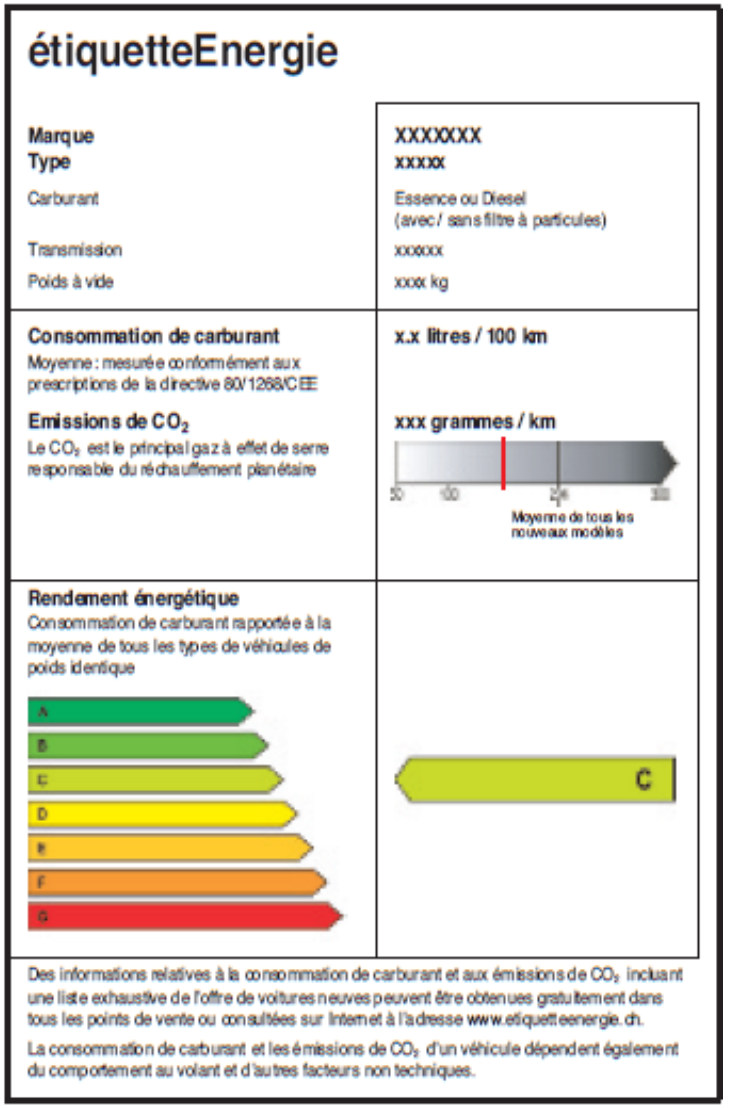

Energy Label
KEEF
Environment Label (UmE)
2002
4 July 2007
Today
2011

Energy Label

- Weight
- Fuel consumption l/km
- CO^2 emissions at exhaust only

- 7 categories from A (best) to G (worst)
  - Fuel consumption/weight
  - Rewarding low energy consumption but…
    …heavy cars too

FU=1km empty car with driver

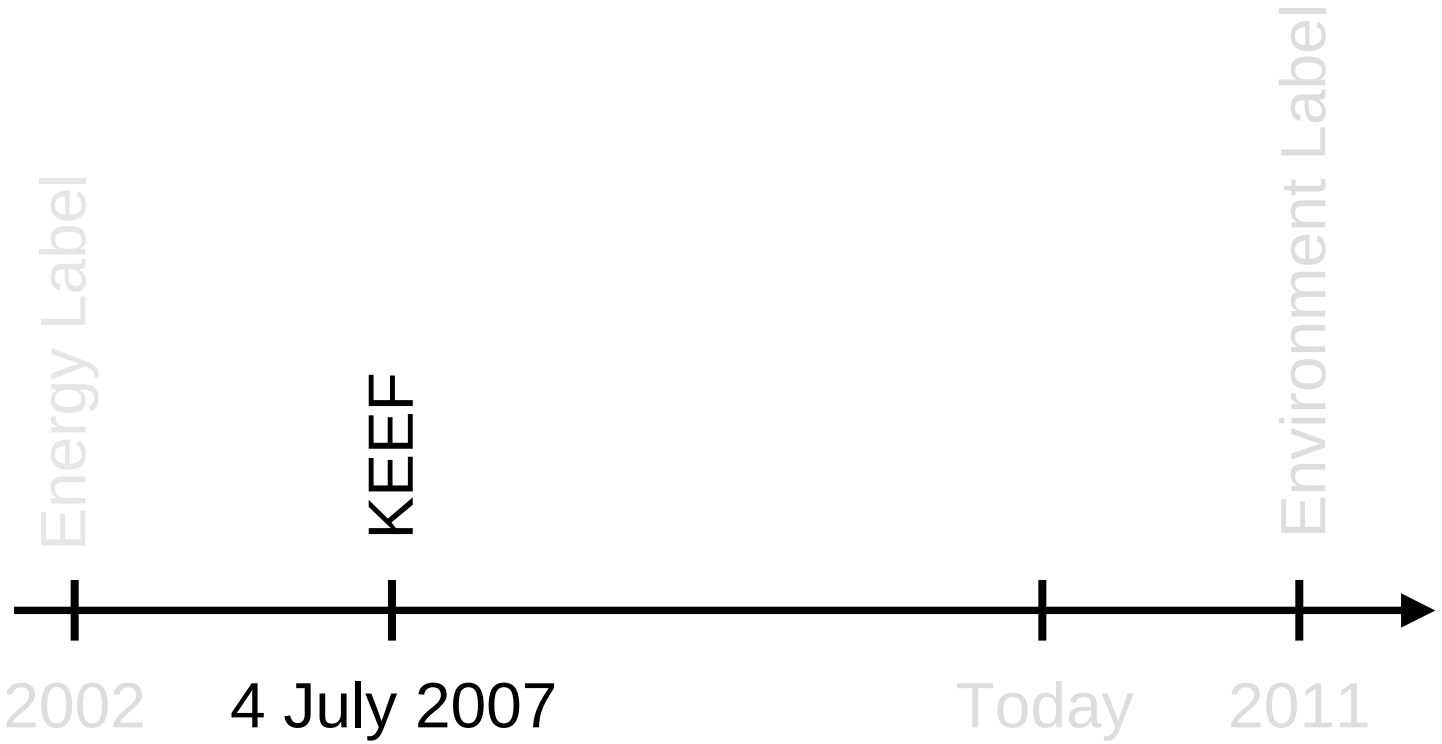


Cleaner Cars (Federal council sust. dev. strategy 2002)

- Climate change
- Air quality
- Noise generation
- Fuel production

- 3th April 2003, FEDRO, FOEN, SFOE, SECO, Autoschweiz (import)
- Initiated by the Strategy for sustainable development 2002
- Database (all cars from 2000)
  - **Fine particles** (Main issue)
  - Fuel consumption
  - Noise
  - NO_x, CO, CO^2, hydrocarbons emissions.

Timeline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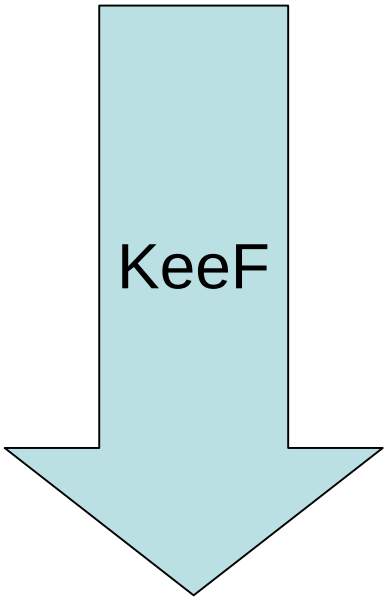
KeeF *(**K**riterien für **e**nergieeffiziente und **e**missionsarme **F**ahrzeuge)*

- Climate change
- Air quality
- Noise generation
- Fuel production

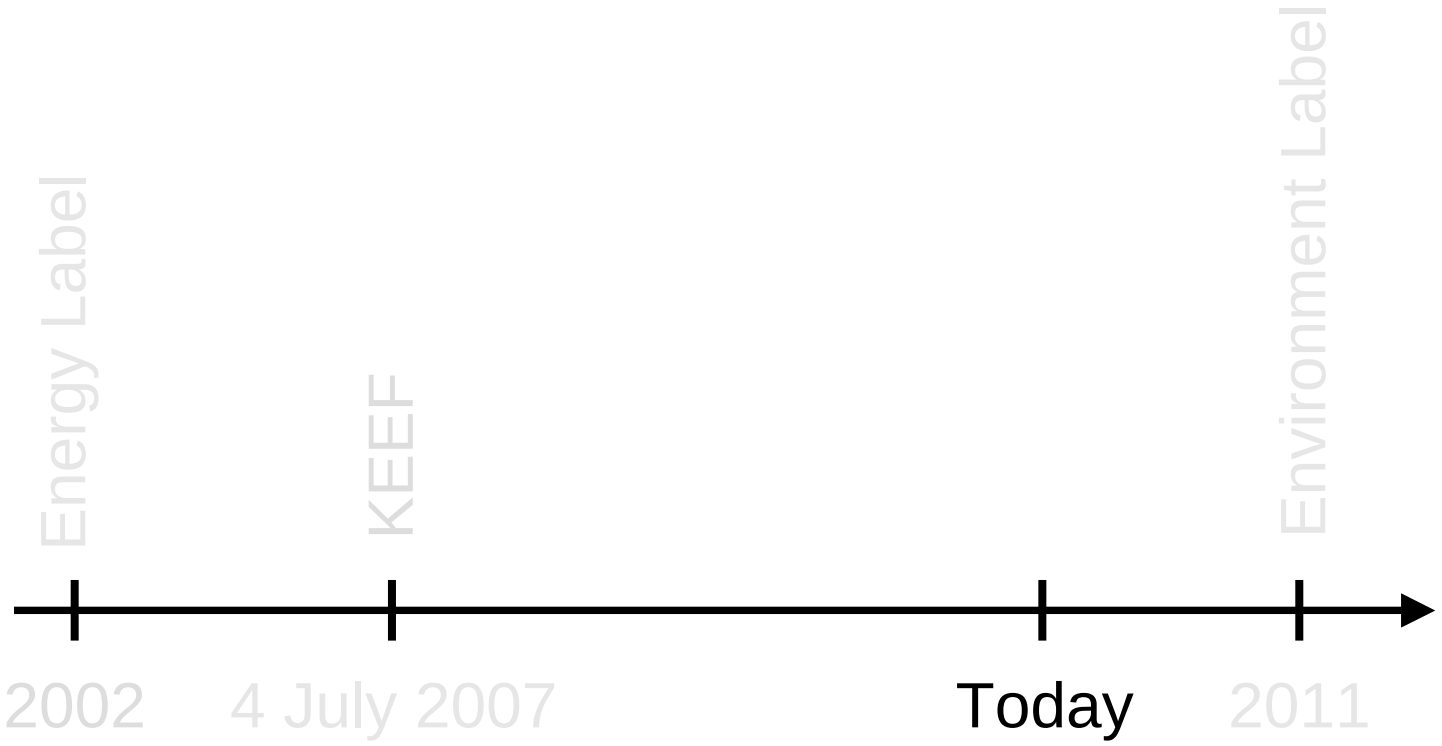
- 4 July 2007, FOEN, SFOE et FEDRO (Media conference)
- Limit fine particles emissions
- Database (all cars from 2000)
  - Fuel consumption
  - Noise
  - Fine particles,
  - NO_x, CO, CO^2, hydrocarbons emissions.

From an energy label…



…to an environmental label (UmE)

Timeline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Legislation

- New ordinance project under development

  Umweltetiketten-Verordnung (UEV)

  - Context
  - Environmental label (UmE)
  - Execution
  - How to calculate emissions

Passenger cars (UmE)

- Labelling **new passenger** cars with an environmental label.
- Passenger car = passenger transport, 9 seats max, 3500 kg max
- New car = not matriculated and < 2000 km

Label content (UmE)

- Energy consumption (basis energy content of fuel)
- CO^2 emissions (only exhaust, tank-to-wheel)
- Ecopoints score (fuel production and exhaust emissions)
- 7 categories classification
- Brand and type of car
- Gear box type and information
- Fuel type
- Euro classification
- Weight
- Year of validity.

Energy consumption (UmE) = gasoline equivalent

- Transformation (calorific value) of all fuel types to gasoline equivalent (of the fuel)

- Diesel : l/100 km × 1,13 $l_{Gazoline}/l_{fuel}$.
- Natural Gaz : m^3/100 km × 1,14 $l_{Gazoline}/m^3_{Gaz}$
- GPL : l/100 km × 0,86 $l_{Gazoline}/l_{fuel}$
- Ethanol (E85) : lfuel/100 km × 0,74 $l_{Gazoline}/l_{fuel}$
- Electric car : kWh/100 km × 0,11 $l_{Gazoline}$/kWh

CO^2 (UmE)

- Only CO^2 tank-to-wheel.
- With correction factors for biogenic fuels.

Calculation of the ecopoints (UmE)

Ecopoints/km (UBP/km)

Ecopoints to assess :

- NOx emission (tank-to-wheel)
- HC emission (NMVOC, Methane, Benzol)
- Fine particles (tank-to-wheel)
- CO emission (tank-to-wheel)
- CO^2 emission (tank-to-wheel)
- Noise (tank-to-wheel)
- Fuel production (well-to-tank)

Ecofactors example 1 (UmE)

- Ecofactors for a gasoline car:

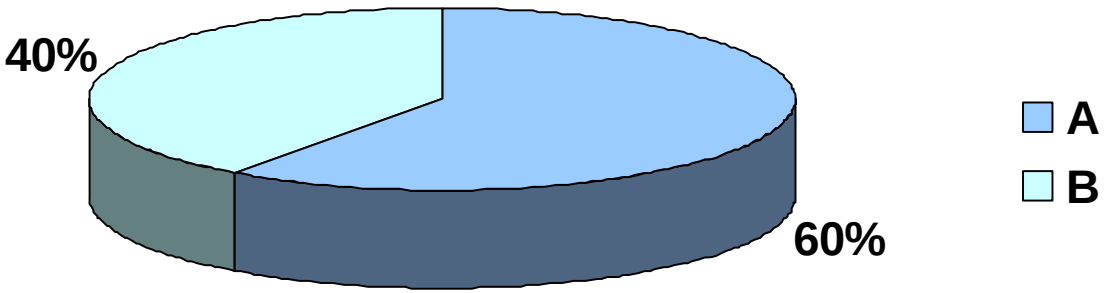
NO_x	NO_x emissions (g/km) × 45 UCE/g
HC	HC emissions (g/km) × 127 UCE/g
CO	CO emissions (g/km) × 0,49 UCE/g
CO^2	CO^2 emissions (g/km) × 0,31 UCE/g
Noise	10 ^ (0,099962 × dB – 6,243371) UCE/km
Fuel production	Fuel consumption l/km × 797 UCE/l

Ecofactors example 2 (UmE)

- Ecofactors for a diesel car:

NO_x	Like gasoline car
HC	HC emissions (g/km) × 106 UCE/g
CO	Like gasoline car
CO^2	Like gasoline car
Noise	Like gasoline car
Fuel production	Fuel consumption × 718 UCE/l

Energetic Efficiency (UmE)

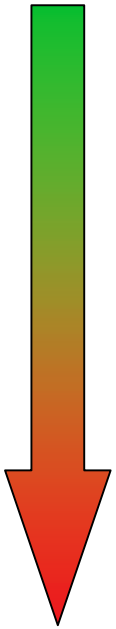


- A = Primary energy (liter gasoline)
- B = fuel consumption/Weight of empty car

$$BWZ_i = \left\{\left[(1-r)\cdot E_i' + r\cdot EE_i'\right] + 3\right\}\times 100 \qquad r = 0.4$$

7 Environmental Categories (UmE)

Best

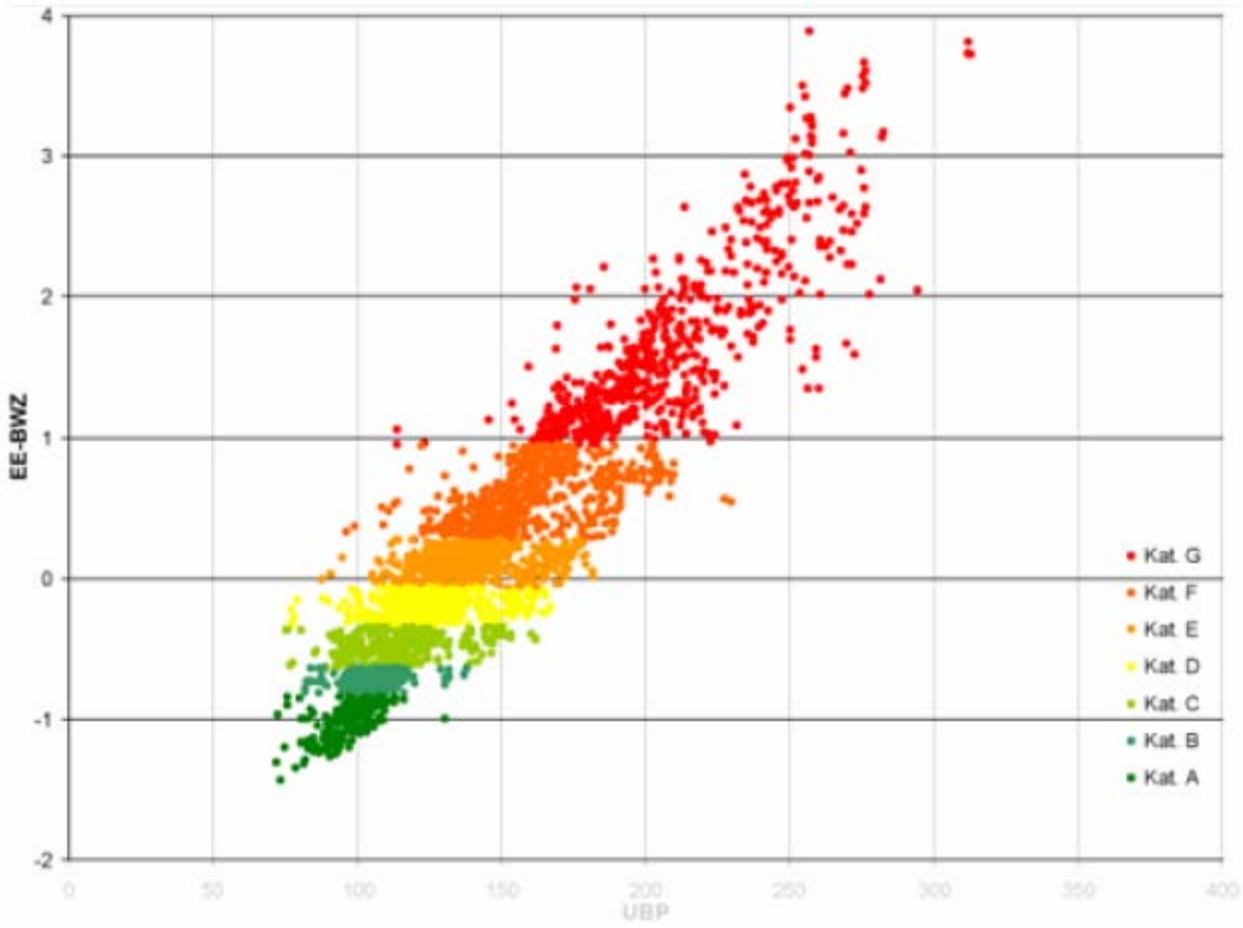


Worst

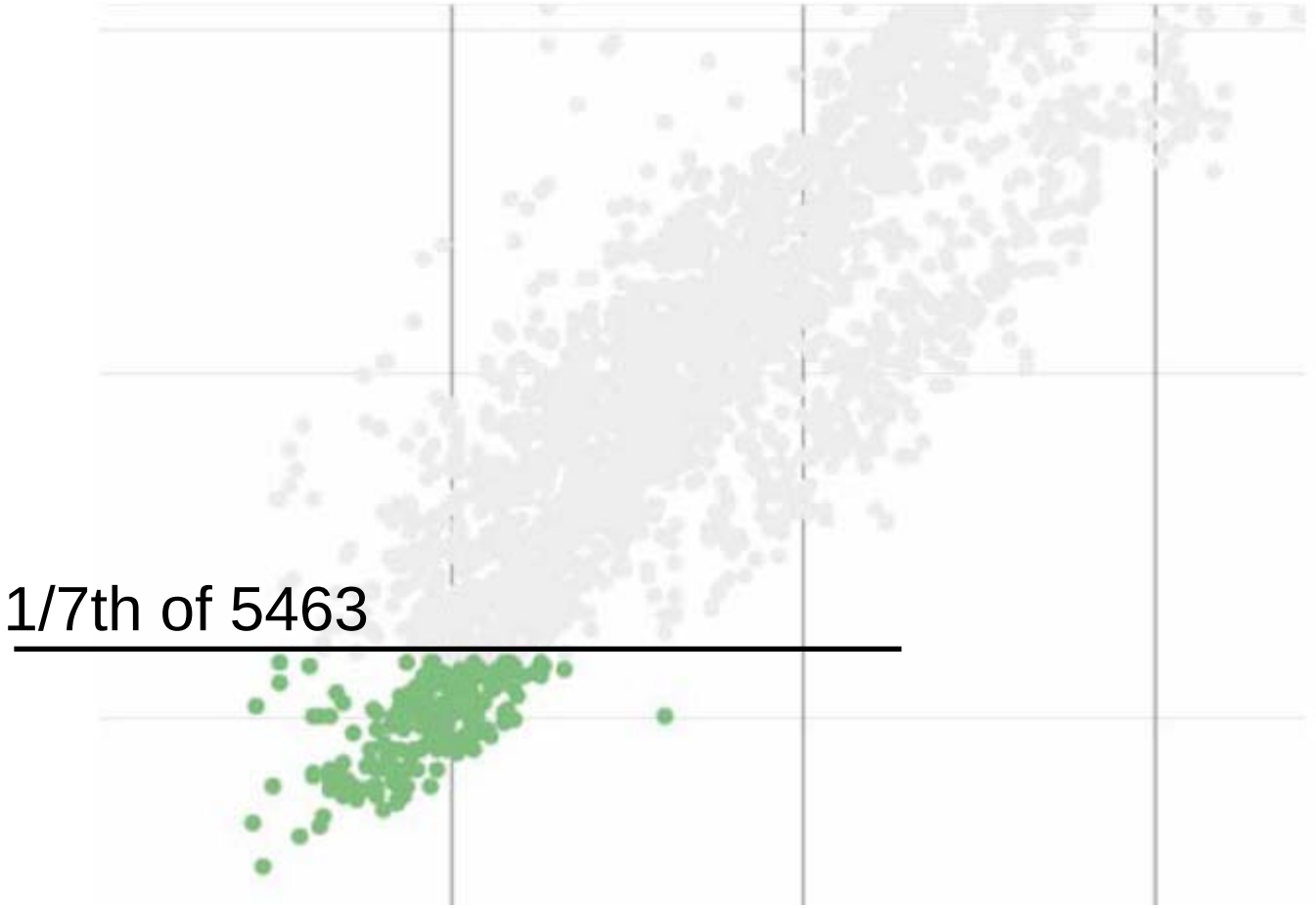
Cat	E. Efficiency	Ecopoints [1)]
A	1/7	20%
B	1/7	40%
C	1/7	60%
D	1/7	70%
E	1/7	80%
F	1/7	90%
G	1/7	100%

1) Sum of cars evaluated

Euro 5 – Example: 5463 Cars



Euro 5 – Example: 5463 Cars



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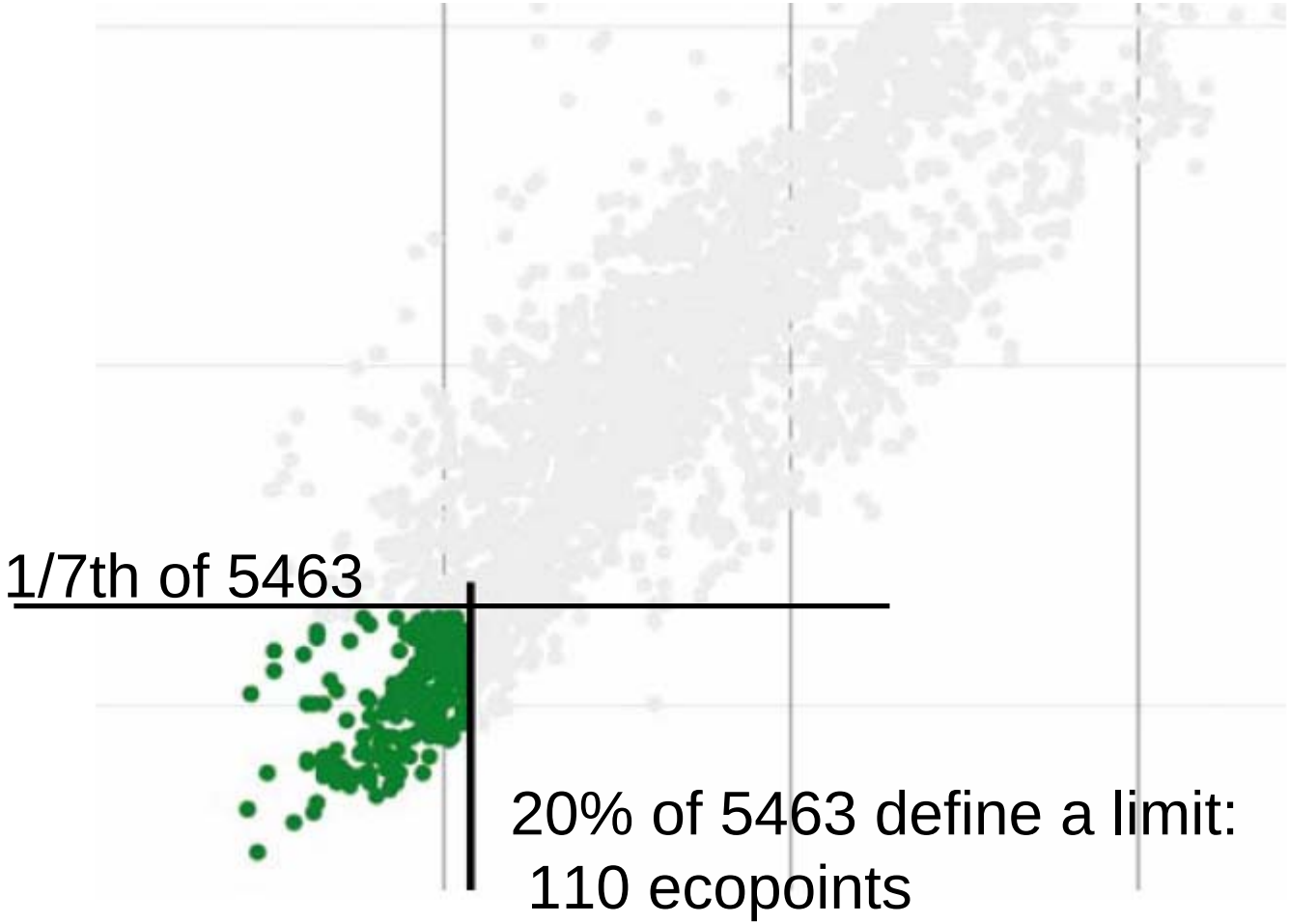
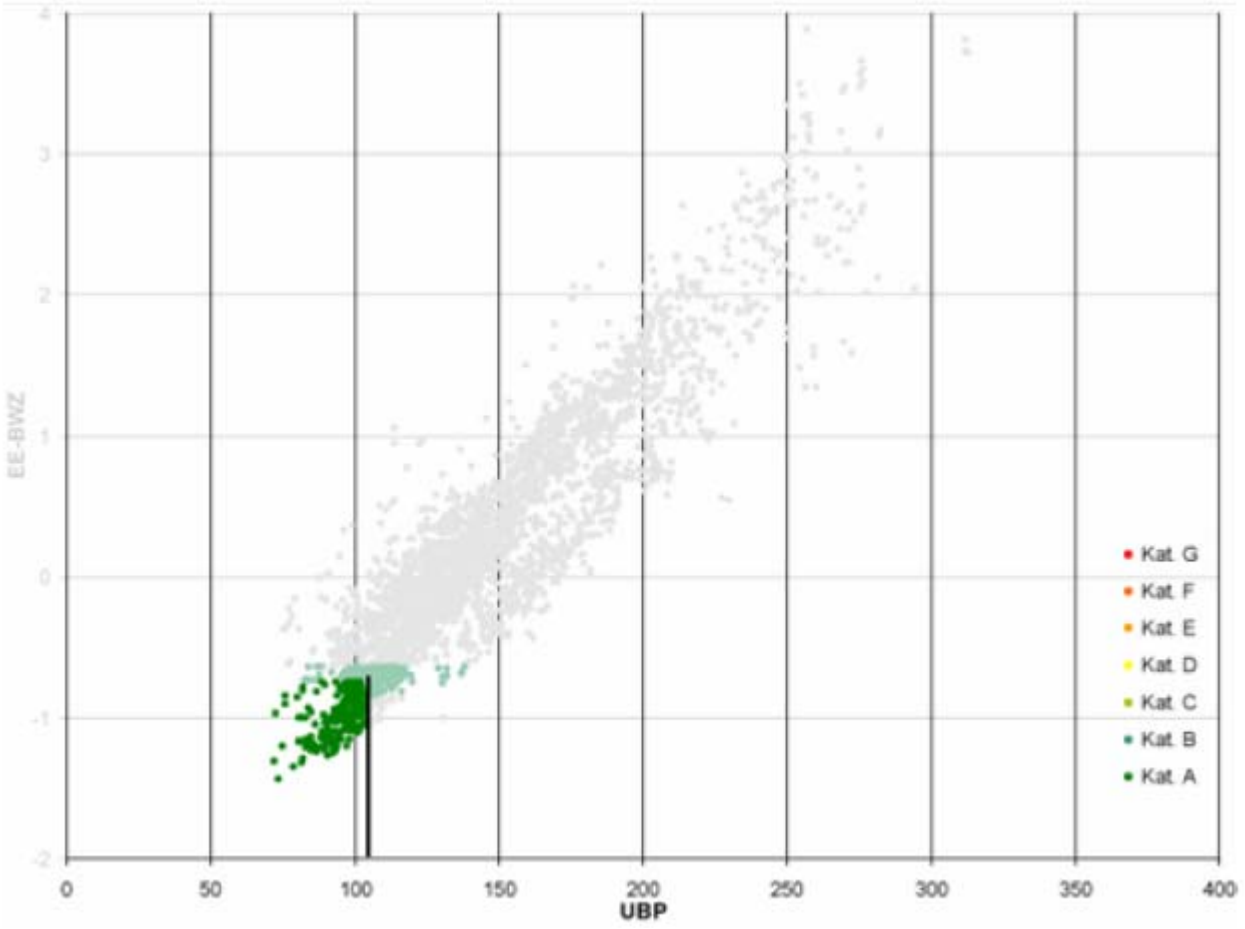


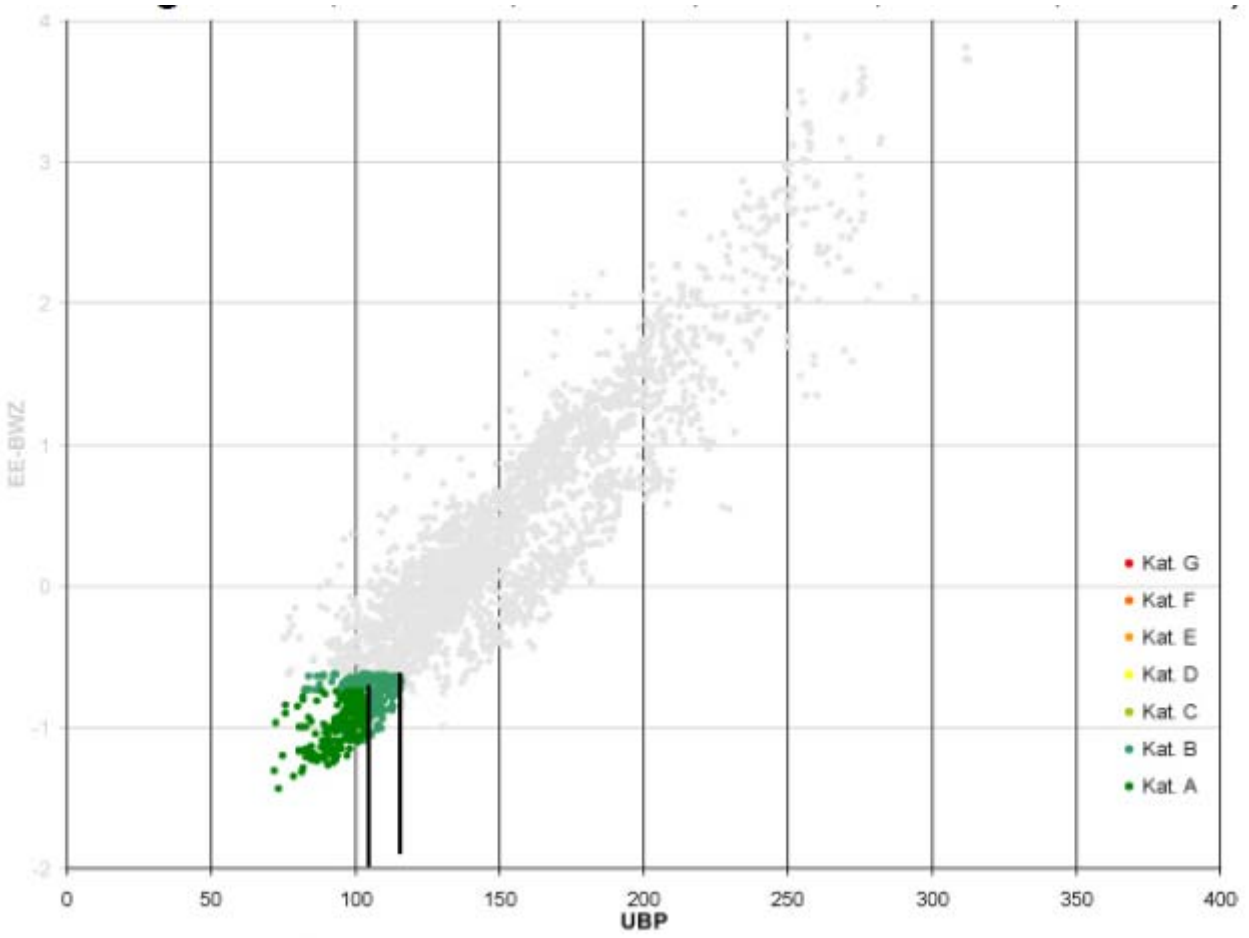
Euro 5 – Example: 5463 Cars

A: 20%



Euro 5 – Example: 5463 Cars

A: 20%
B: 40%



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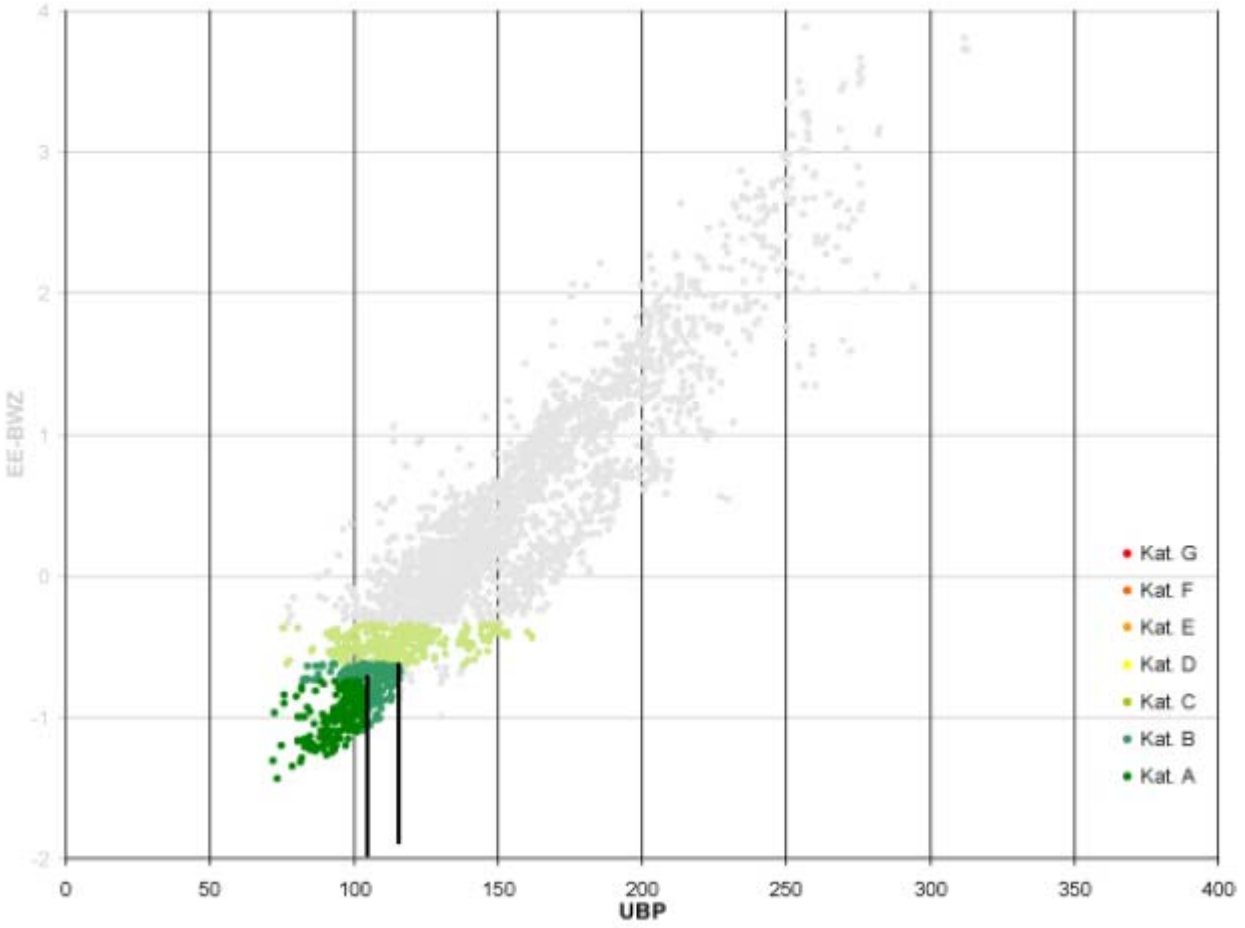
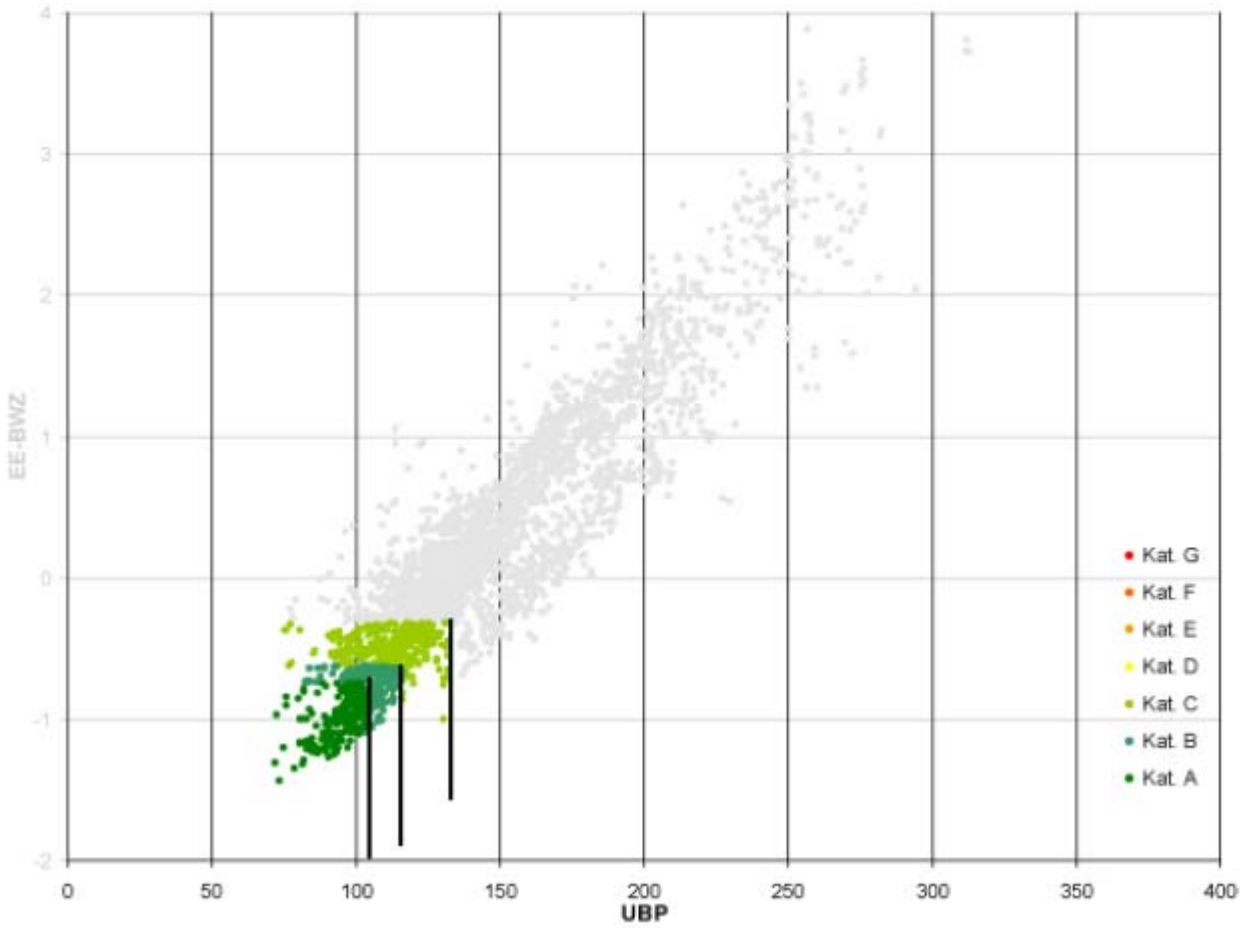


Euro 5 – Example: 5463 Cars

A: 20%
B: 40%
C: 60%



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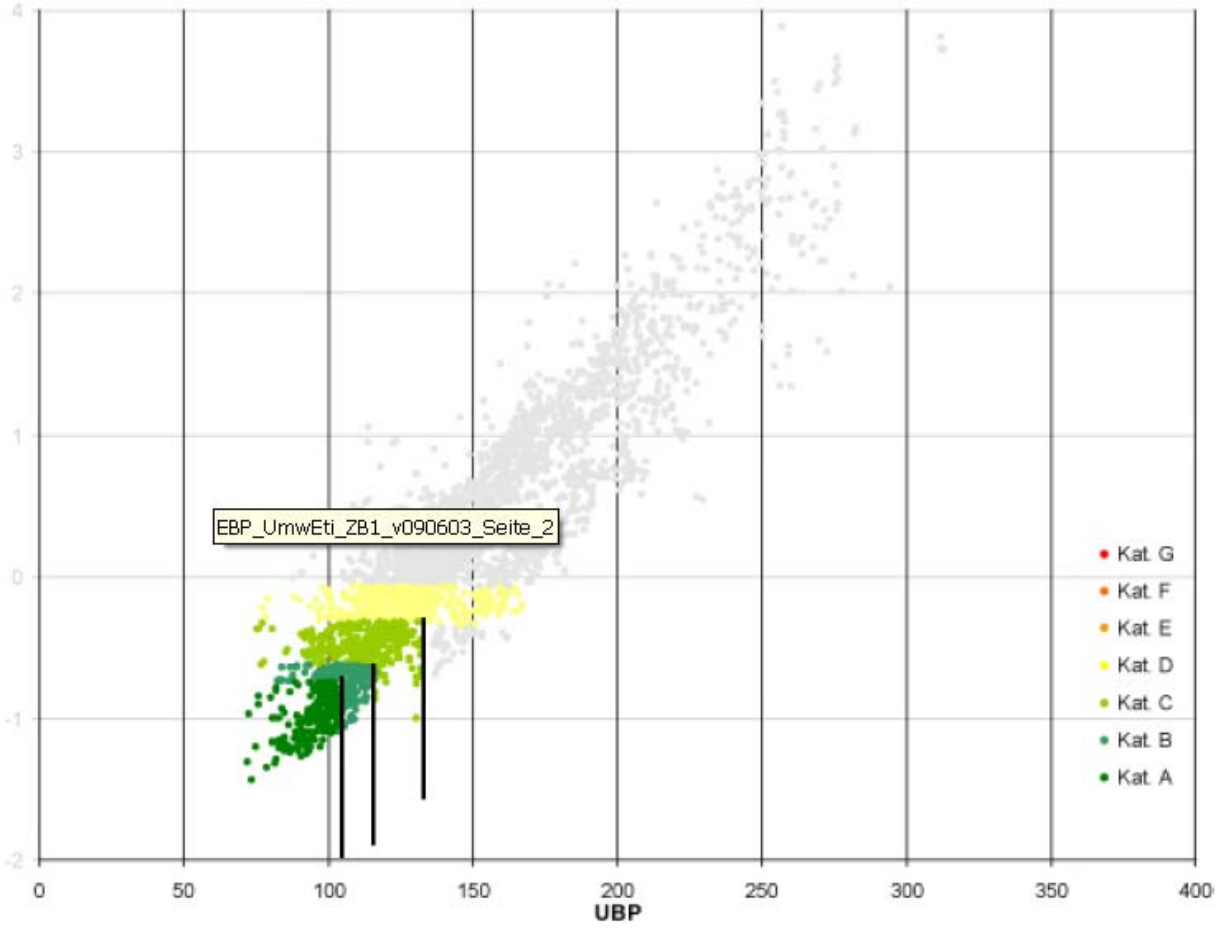

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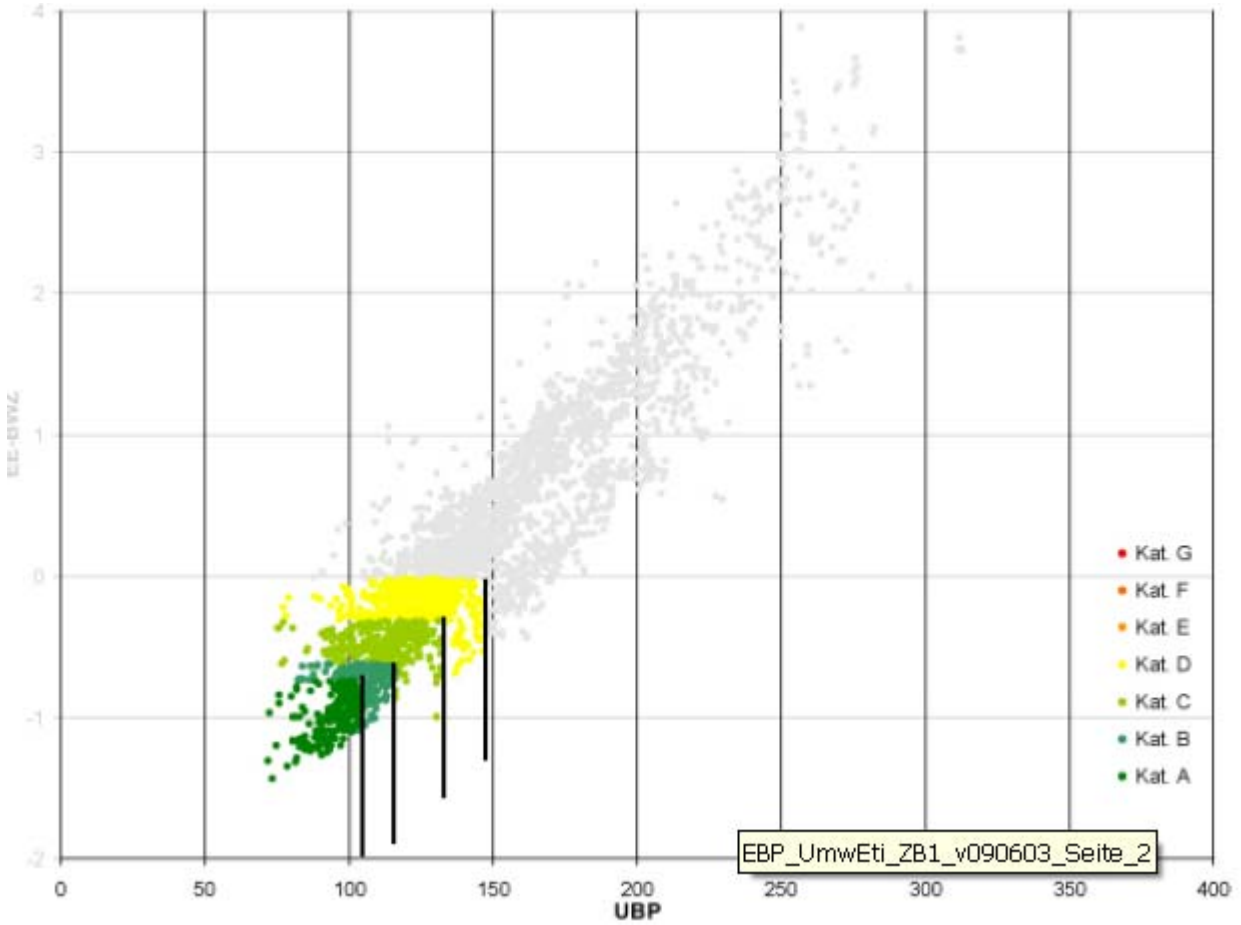

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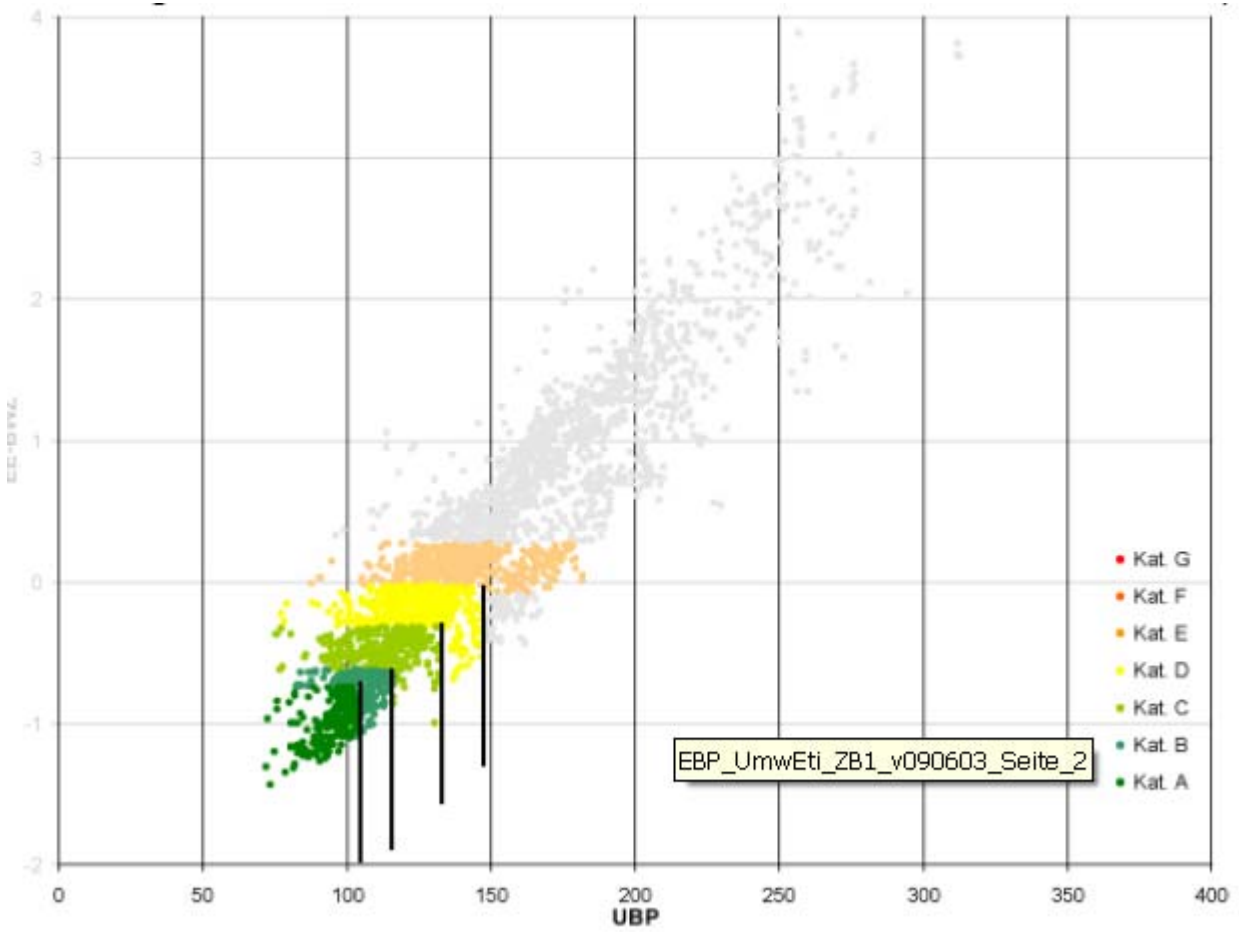

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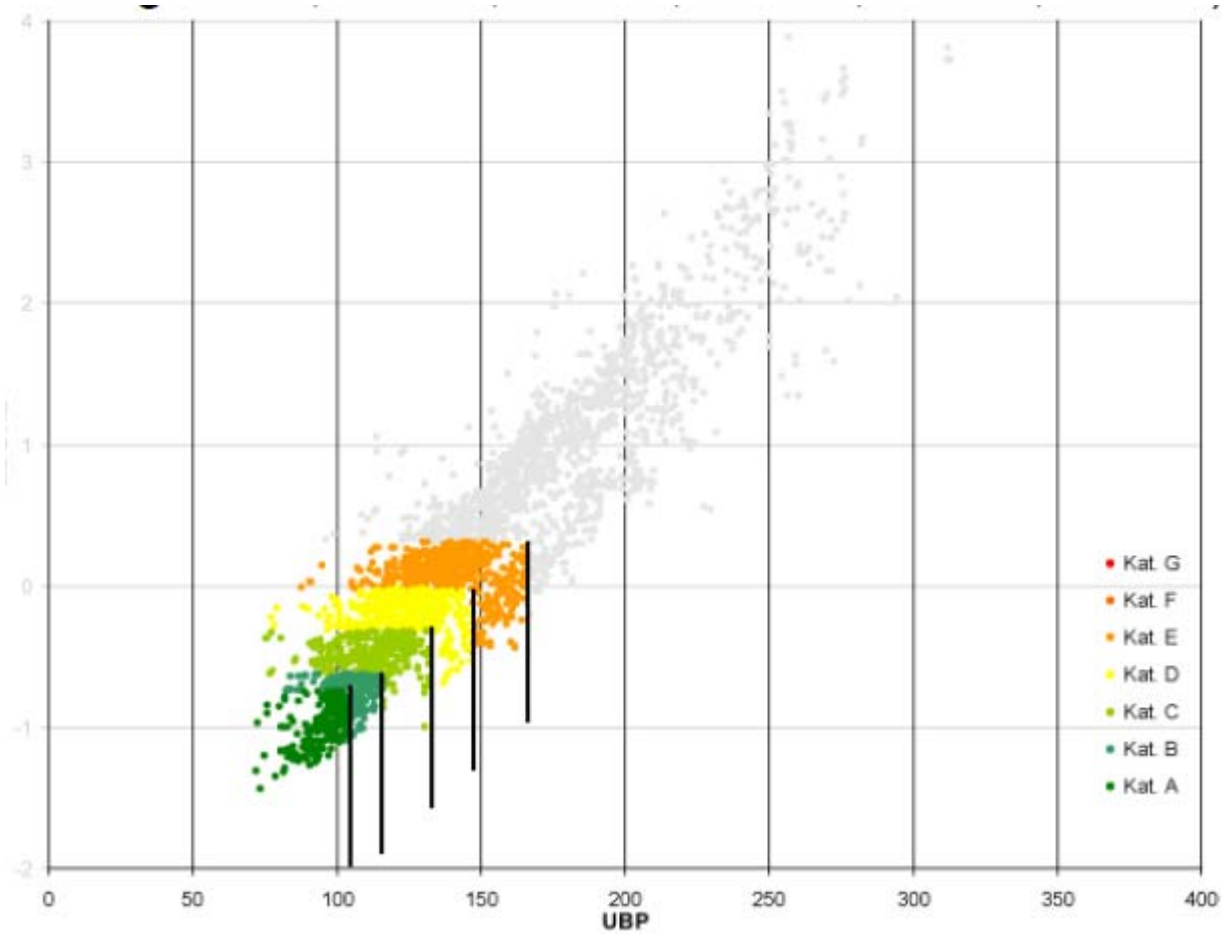

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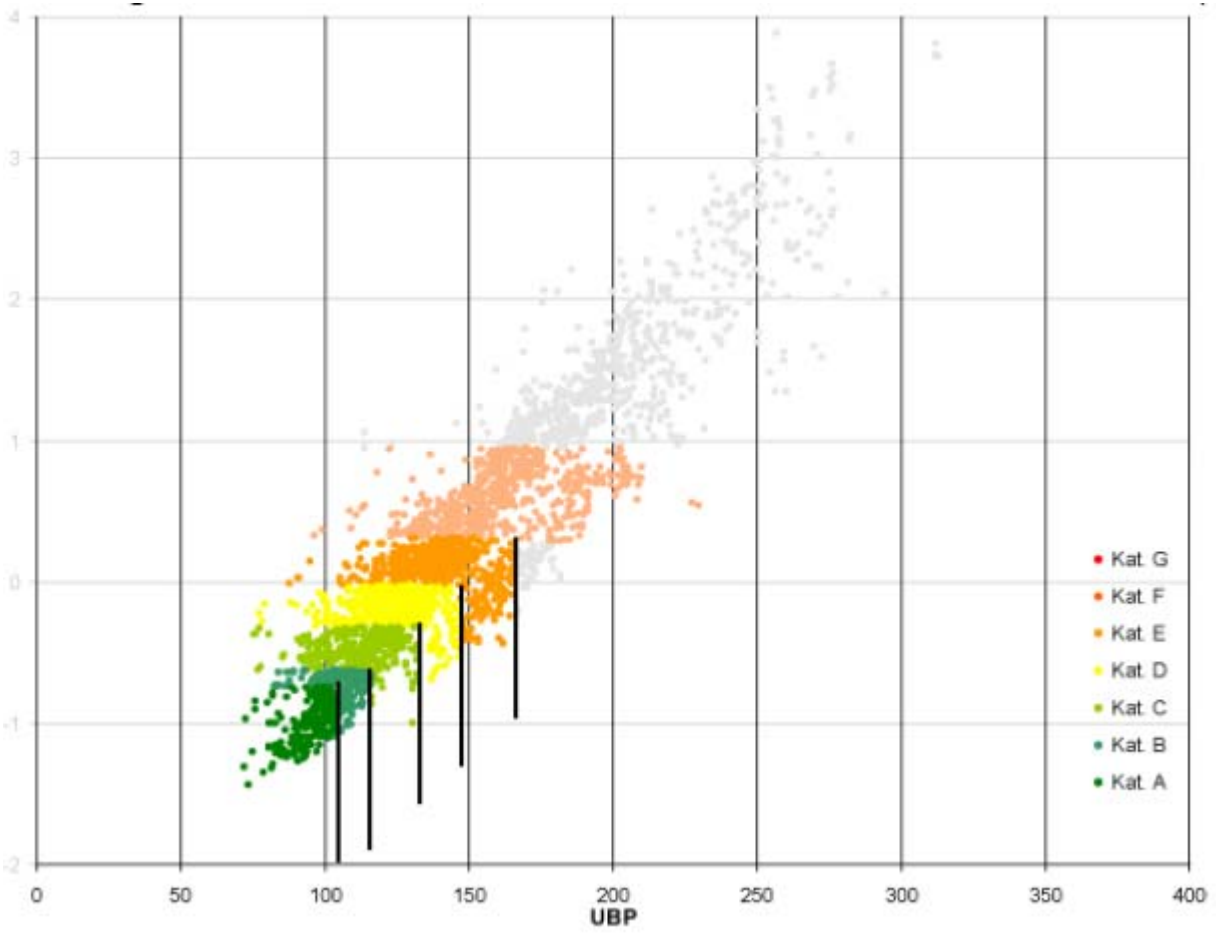

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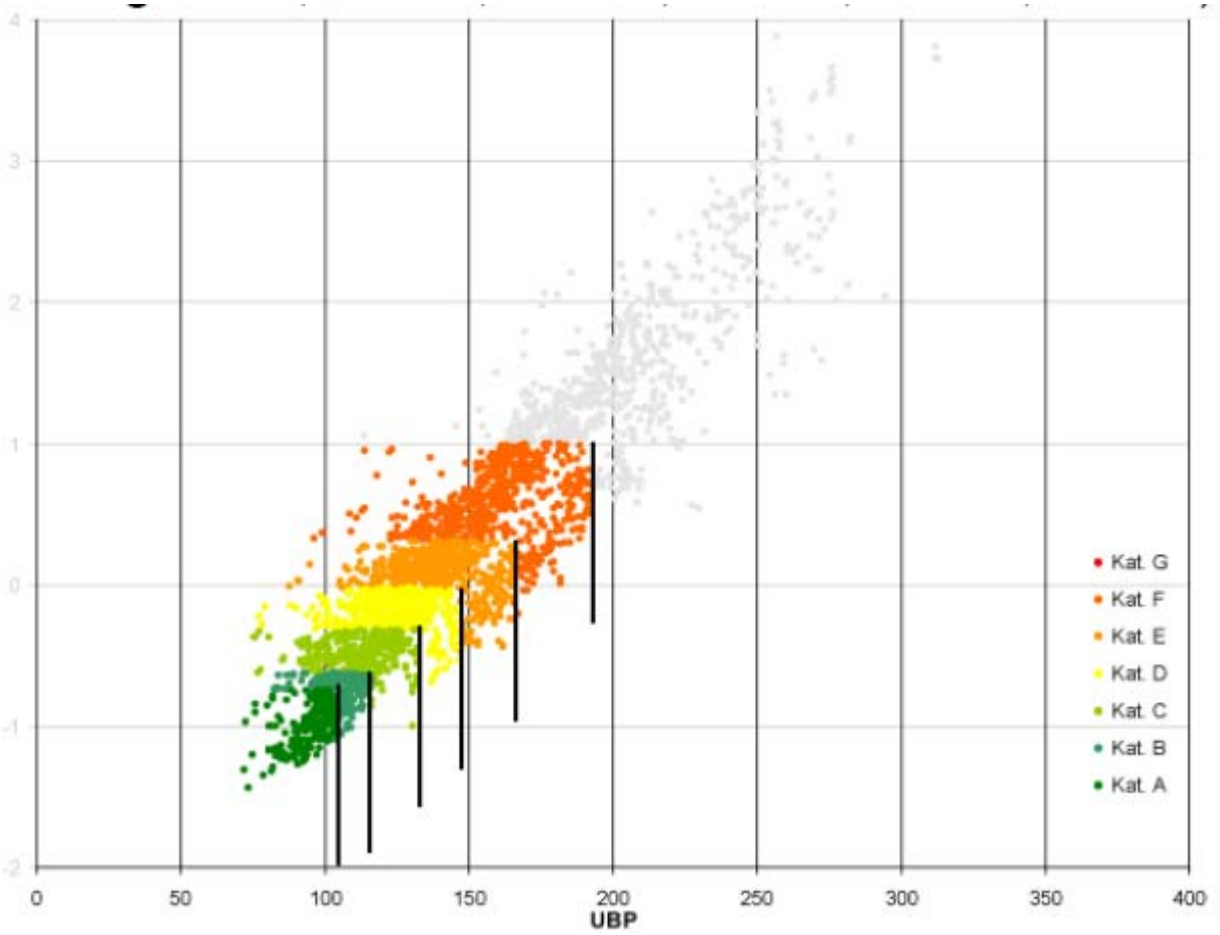

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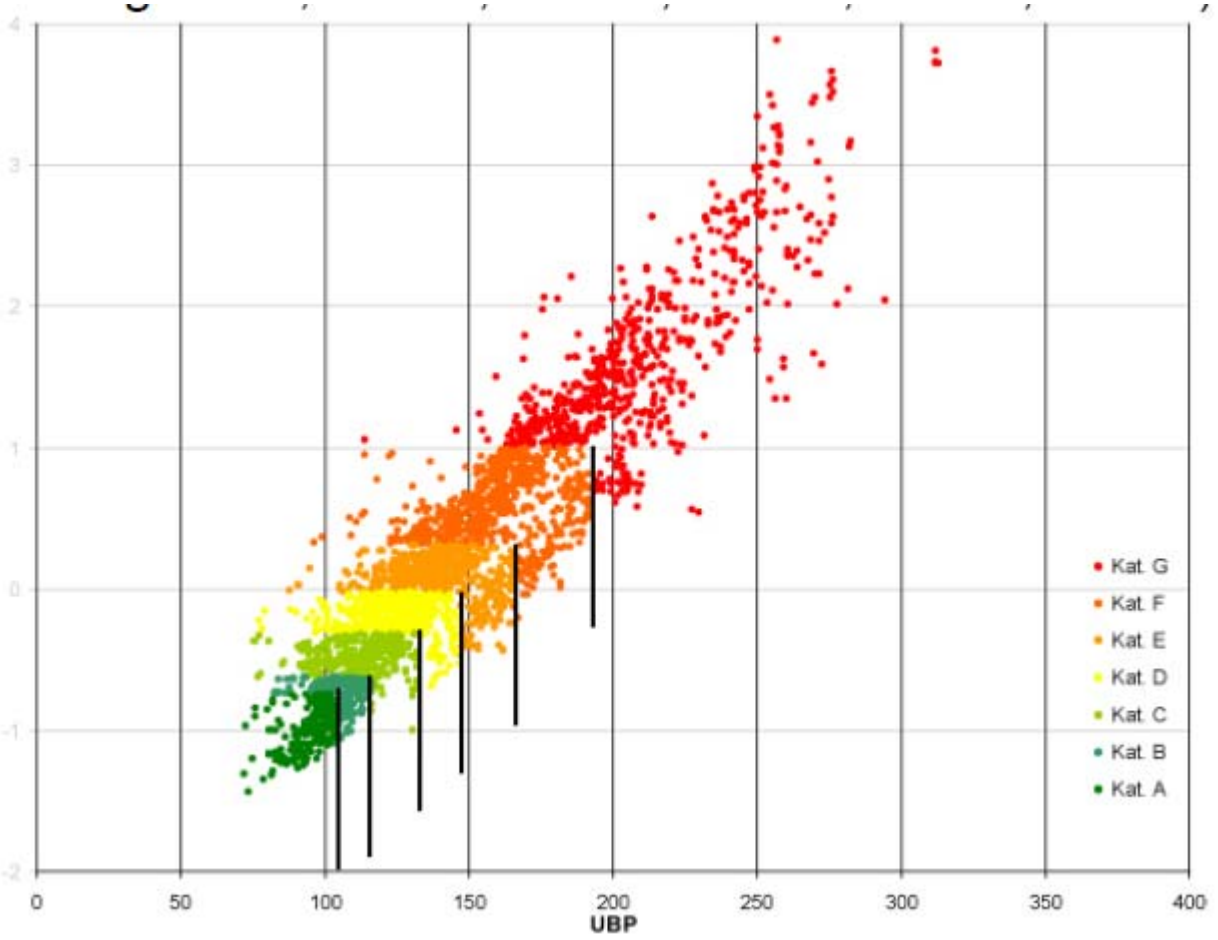
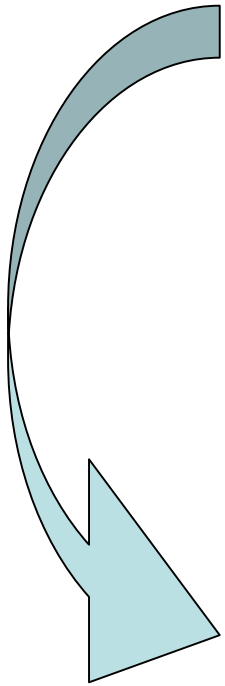
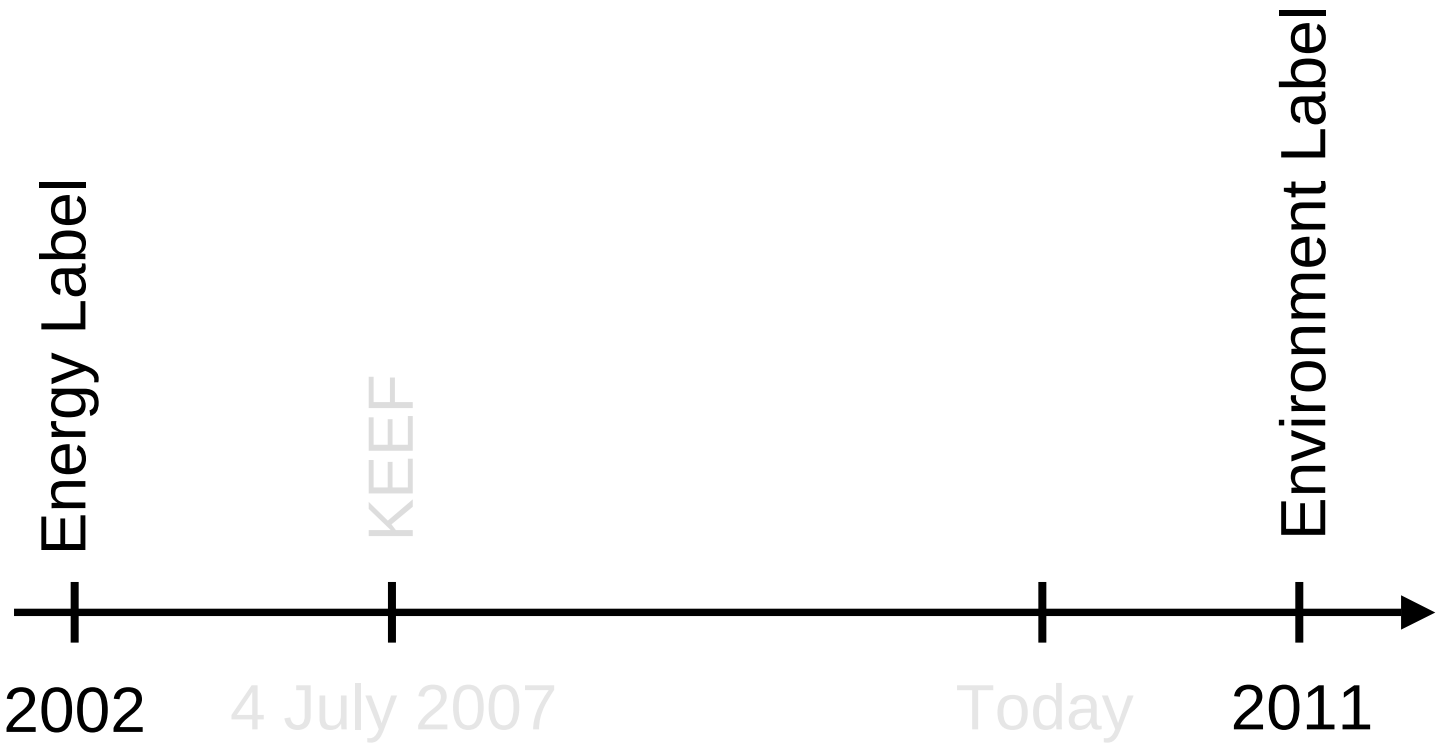


Conclusion 1



- Energylabel
  - Energy consumption/kg car weight
  - CO^2
  - 7 categories (fully weighted)
- KEEF
  - New database with more emissions
  - Setup for new label
  - Public
- Environmental label
  - Ecopoints
  - Energy
  - CO^2
  - 7 categories (less weighted)

Conclusion 2



Thank you for your attention

From photo collection of Johan Vrielink