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# DANISH ECODESIGN MARKET SURVEILLANCE 2023

## PRESENTED AT THE IEA TASK 32 SIDE EVENT AT THE PROGETTO FOUCO TRADE FAIR THURSDAY THE 29 FEBRUARY 2024

Ecodesign  EU 2015 1185 and Energy labeling 1186 legal frameworks

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# DANISH ECODESIGN MARKET SURVEILLANCE

SIKKERHEDSSTYRELSEN

| | |
|---|---|
| Publication of the invitation to submit tenders | 9th June 2022 |
| Deadline for submission of tenders | 22th June 2022 |
| Expected date of contract signing | 28th June 2022 |
| Results of the first measurement round | September 2023 |
| All results ready | Q2 2024 |
| Publication of report | ? |

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# 15 LOG WOOD STOVES REQUESTED FROM INDUSTRY

## 13 FREE-STANDING STOVES AND 2 INSET APPLIANCES

| Case number | Solid fuled local space heater - Type | Control options |
|---|---|---|
| PRT-01-002295 | Freestanding appliance | One control: primary and secondary air |
| PRT-01-002297 | Freestanding appliance | Single control on front |
| PRT-01-002302 | Freestanding appliance | Two controls: primary and secondary air |
| PRT-01-002300 | Freestanding appliance | One control: primary and secondary air |
| PRT-01-002304 | Inset appliance | One control: primary and secondary air |
| PRT-01-002435 | Freestanding appliance | One control: primary and secondary air |
| PRT-01-002431 | Freestanding appliance | One control: primary and secondary air |
| PRT-01-002427 | Freestanding appliance | Two controls: primary and secondary air (+tertiary) |
| PRT-01-002429 | Freestanding appliance | Two controls: primary and secondary air (+tertiary) |
| PRT-01-002417 | Freestanding appliance | One control: primary and secondary air |
| PRT-01-002419 | Freestanding appliance | Two controls: primary and secondary air |
| PRT-01-002421 | Freestanding appliance | Two controls: primary (automatic) and secondary air (+tertiary) |
| PRT-01-002433 | Inset appliance | One control: primary and secondary air |
| PRT-01-002425 | Freestanding appliance | One control: primary and secondary air |
| PRT-01-002423 | Freestanding appliance | Two controls: primary (for coal) and secondary air (+tertiary) |

## Control criteria: Declared values + ecodesign tolerances renders as ”Pass”

The verification tolerances are:

- Efficiency, no more that 5% (units) below DC
- PM emission, no more than 20 mg higher than DC
- OGC emission, no more than 35 mg higher than DC
- CO emission, no more than 275 mg higher than DC
- NOx emission, no more than 30 mg higher than DC

# TERMS

- The stoves were selected from randomly from stoves available on the Danish market
- The manufacturer was requested to make a specific stove available for market surveillance measurments
- The manufacturer was offered possibility to give detailled written instructions on fuelling and operation

- The lab had as product documentation:
  - the Operators Instructions,
  - the Declaration of Conformity (DoC)
  - Ecodesign technical information (table 1)
  - the extended fueling and operating instructions by the manufacturer.
- During the first measuremet round, there were no representatives present from the manufacturers
- Any extra test work was at the expense of the manufacturer

# CONTOL TEST RESULTS

| Efficiency at nominal heat output | Seasonal efficiency | Energy efficiency cla | Heat output | CO emission | PM emission | NOx emission | OGC emission | Conformity? |
|---|---|---|---|---|---|---|---|---|
| 74,8 | 64,8 | A | 6,2 | 852 | 16 | 102 | 40 | No |
| 77,0 | 67,0 | A | 4,9 | 1255 | 55 | 87 | 132 | No |
| 77,9 | 67,9 | A | 6,5 | 951 | 19 | 87 | 79 | Yes |
| 78,2 | 68,2 | A | 6,8 | 1649 | 73 | 75 | 179 | No |
| 84,4 | 74,4 | A+ | 15,4 | 1034 | 34 | 88 | 108 | No |
| 81,9 | 71,9 | A+ | 6,1 | 1277 | 13 | 90 | 86 | Yes |
| 78,5 | 68,5 | A | 6,4 | 892 | 32 | 98 | 105 | No |
| 69,6 | 59,6 | A | 6,2 | 1630 | 17 | 89 | 145 | No |
| 74,2 | 64,2 | A | 8,5 | 1025 | 6 | 97 | 76 | No |
| 76,5 | 67,0 | A | 4,8 | 1332 | 22 | 104 | 191 | No |
| 74,5 | 64,5 | A | 6,3 | 1117 | 16 | 85 | 85 | Yes |
| 77,3 | 67,3 | A | 6,8 | 2148 | 29 | 93 | 208 | No |
| 81,9 | 72,0 | A+ | 6,9 | 747 | 25 | 88 | 88 | Yes |
| 78,8 | 68,8 | A+ | 5,8 | 802 | 15 | 98 | 79 | No |
| 77,2 | 67,2 | A | 5,2 | 2153 | 15 | 92 | 257 | No |

11 manufacturers had declares specific performance values
4 manufacturers had declares relative to the Ecodesign thresholds

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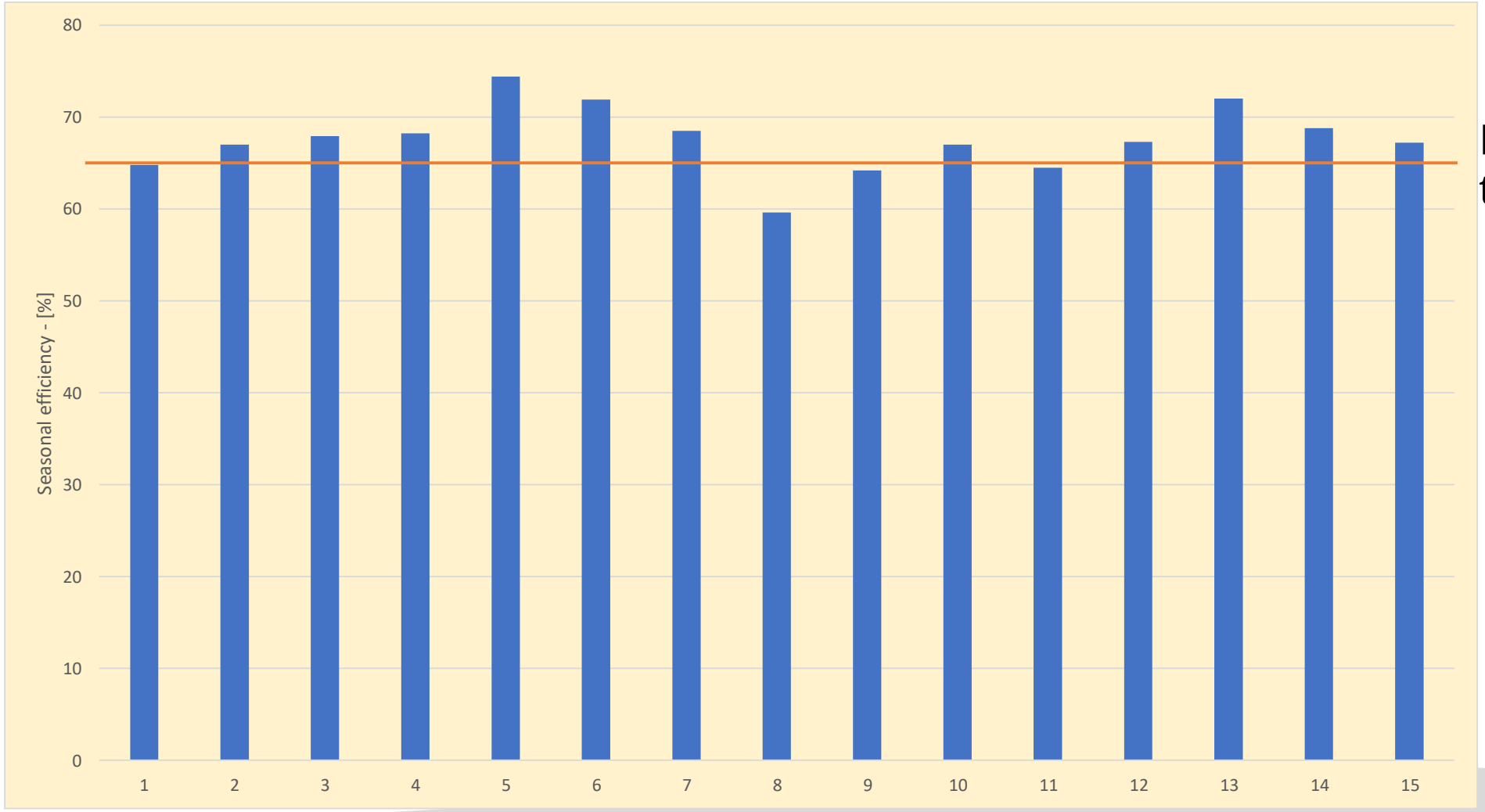
# SEASONAL EFFICIENCY




Ecodesign threshold

Only 4 stoves had lower efficiency than the threshold, 2 when evaluated as an integer

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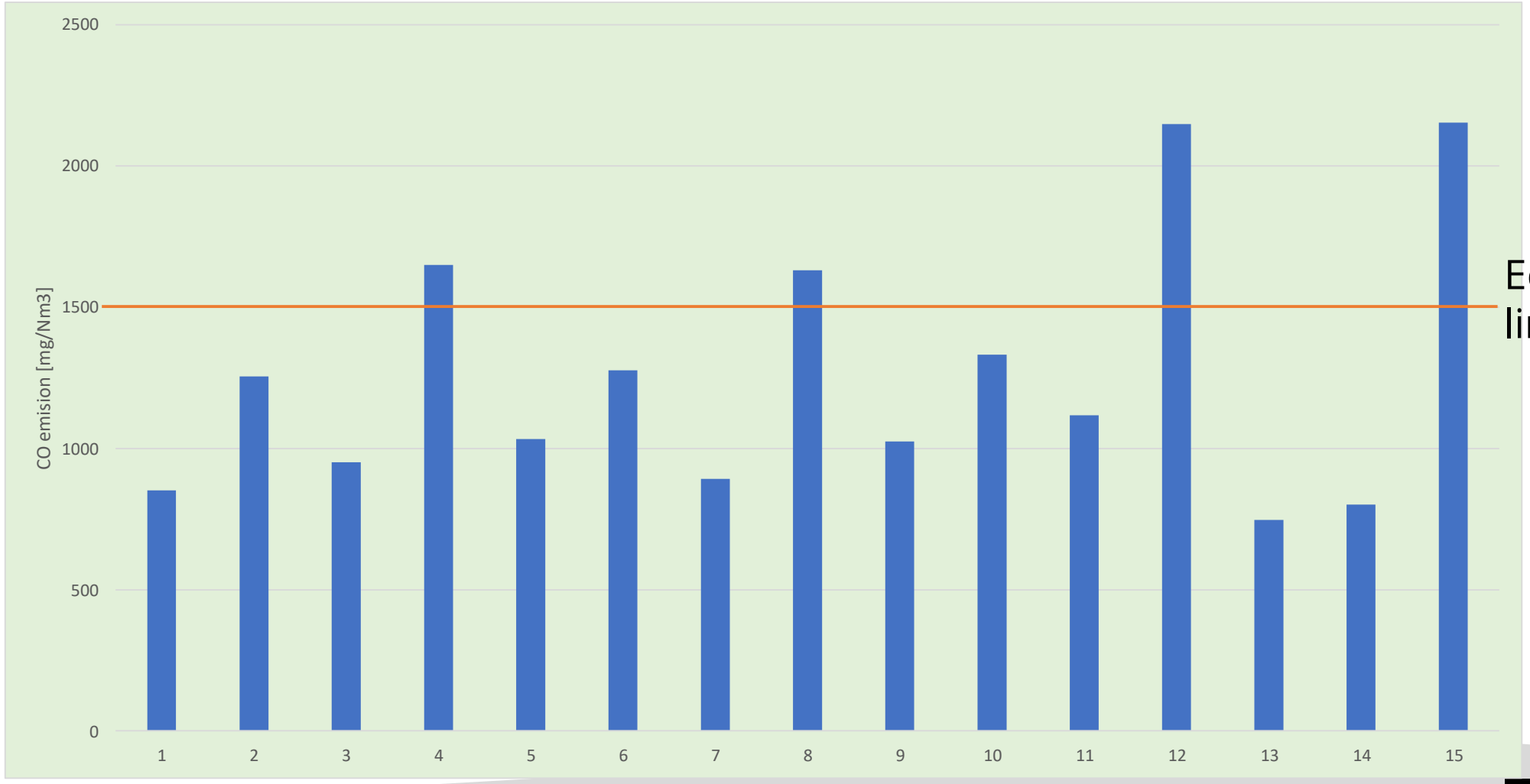
# EMISSION OF CO




4 stoves had higher CO emisison than threshold, but 5 failed when evaluated against the declared value

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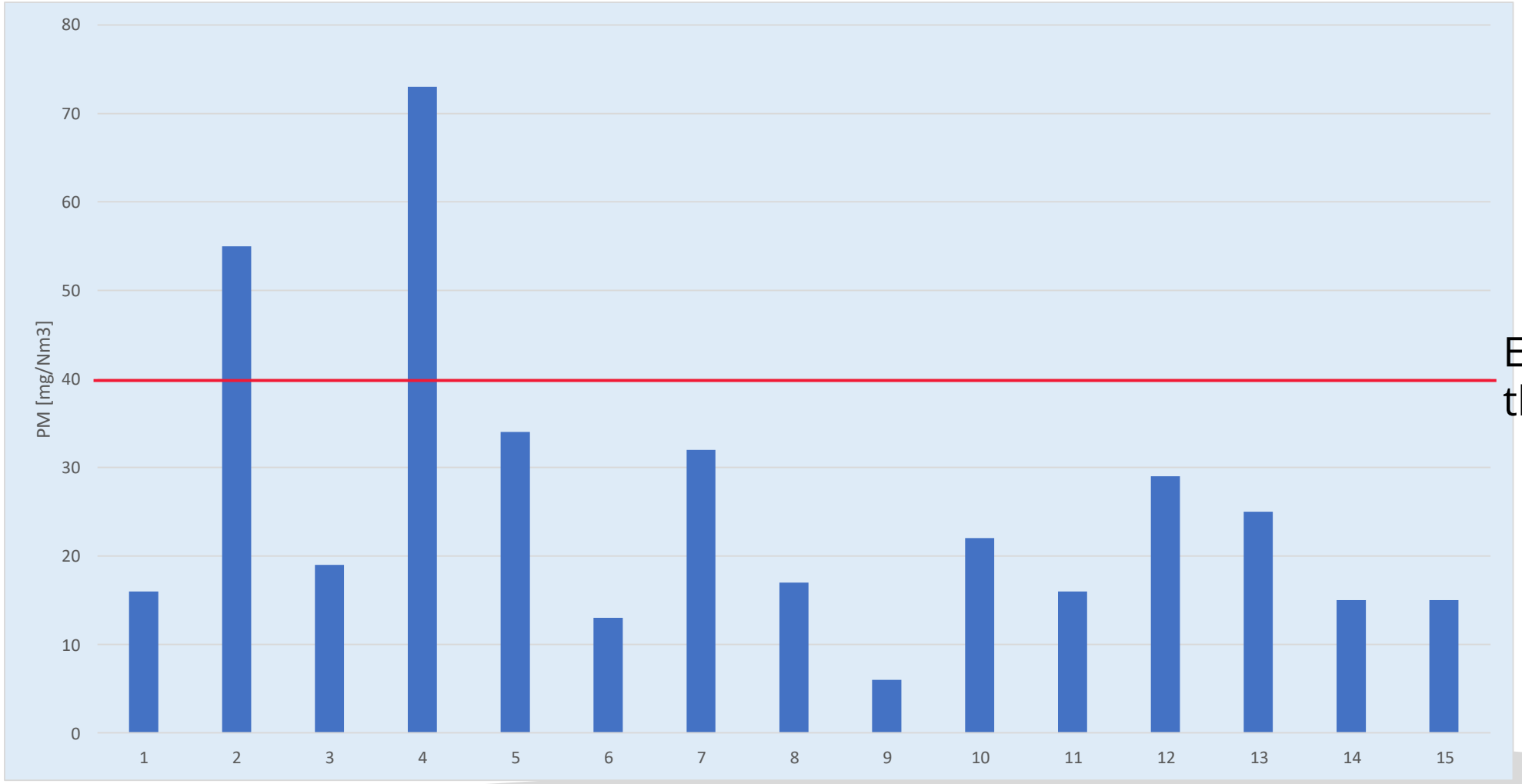
# PM HF EMISSION




Ecodesign threshold

Only 2 stoves had higher PM than the treshold, but 3 failed when evaluated against the declared value

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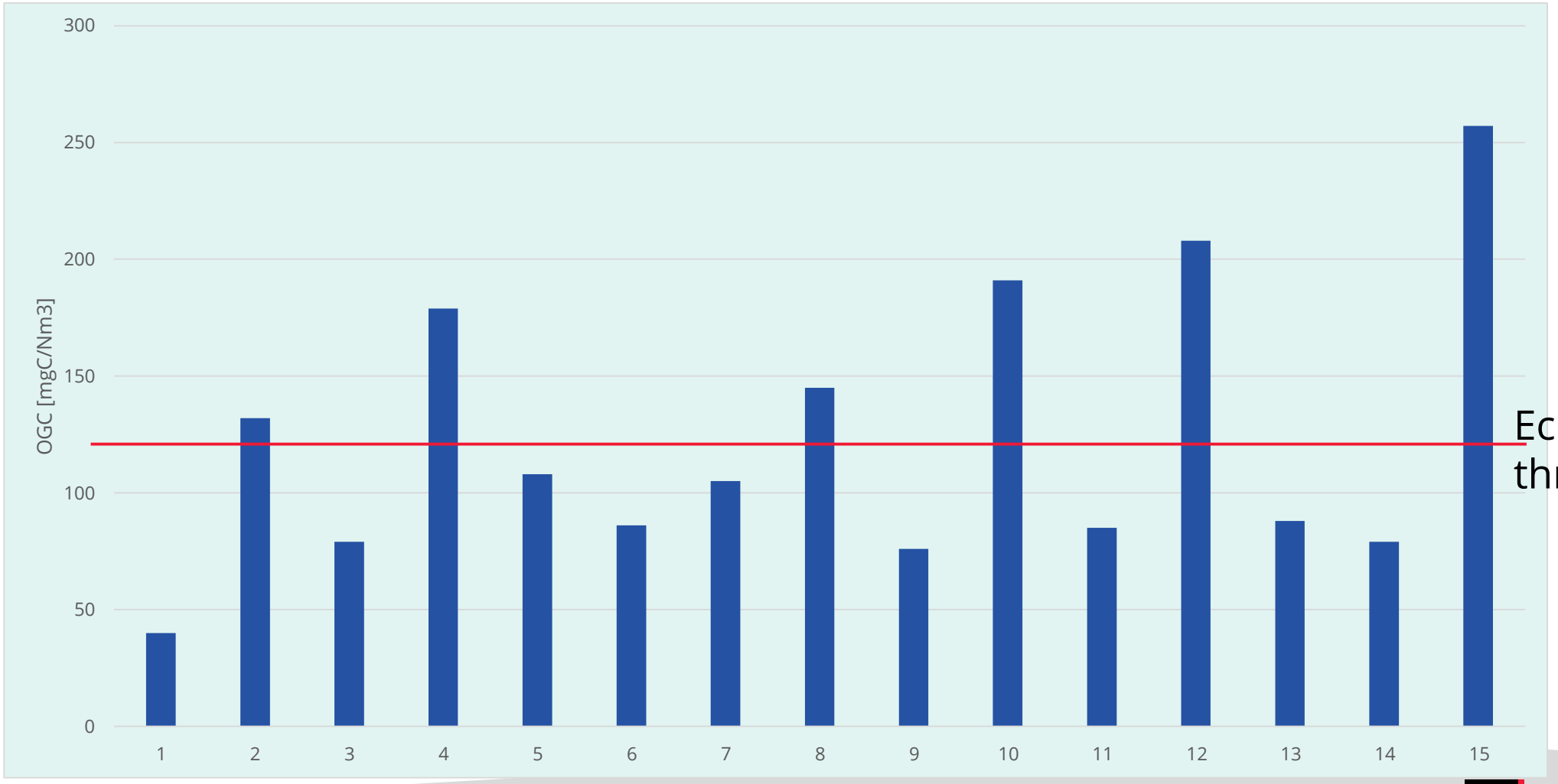
# EMISSION OF OGC




6 stoves had higher OGC than the threshold, but 9 failed when evaluated against the declared value

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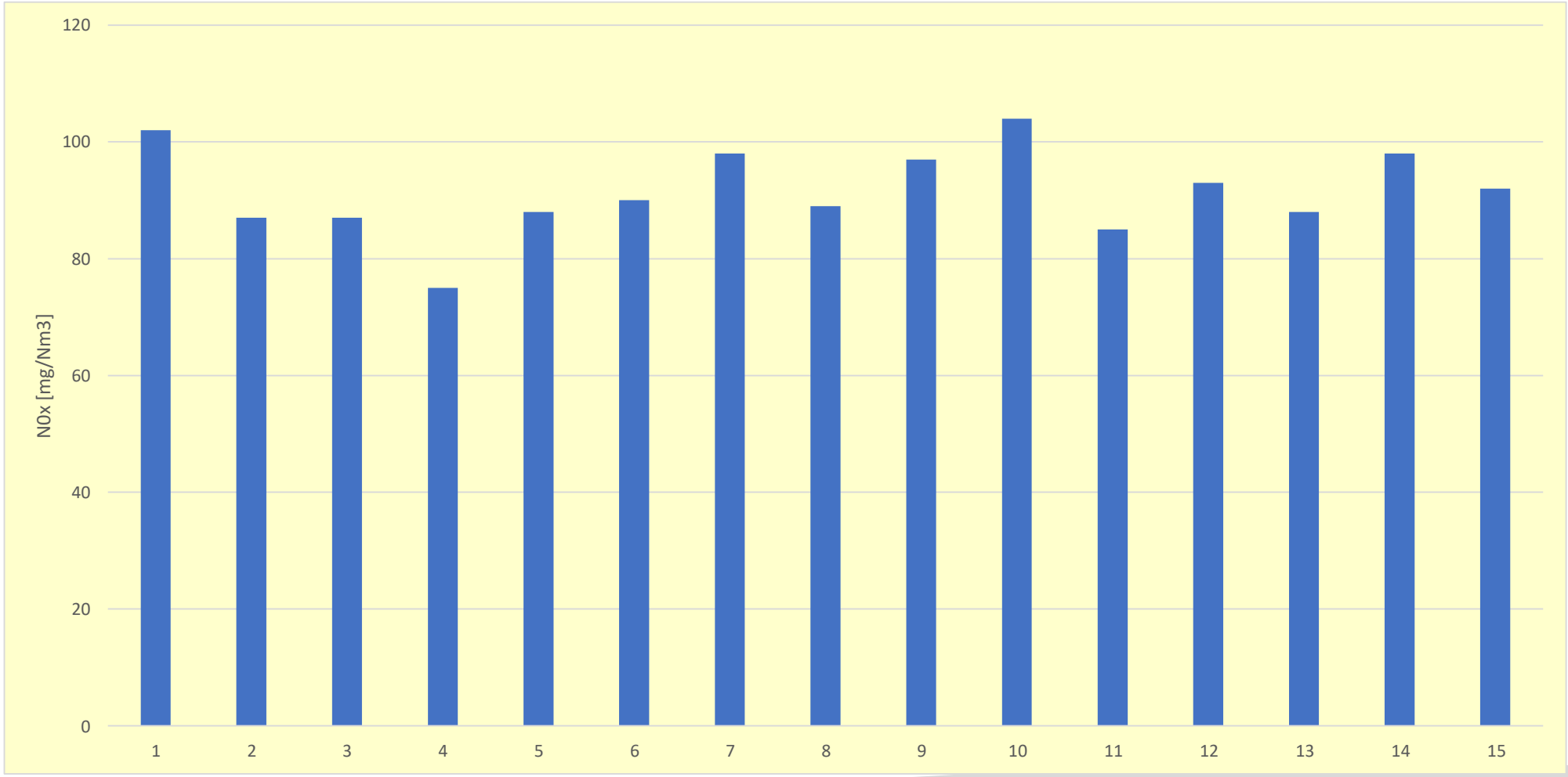
# EMISSION OF NOx




No stoves had higher NOx than the threshold (200mg), but 1 failed when evaluated against the declared value

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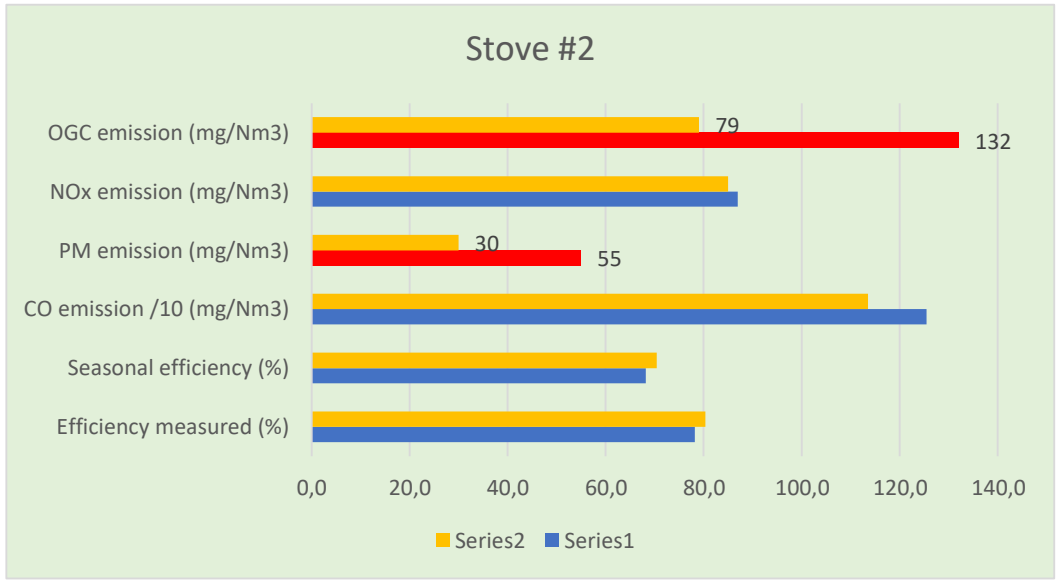
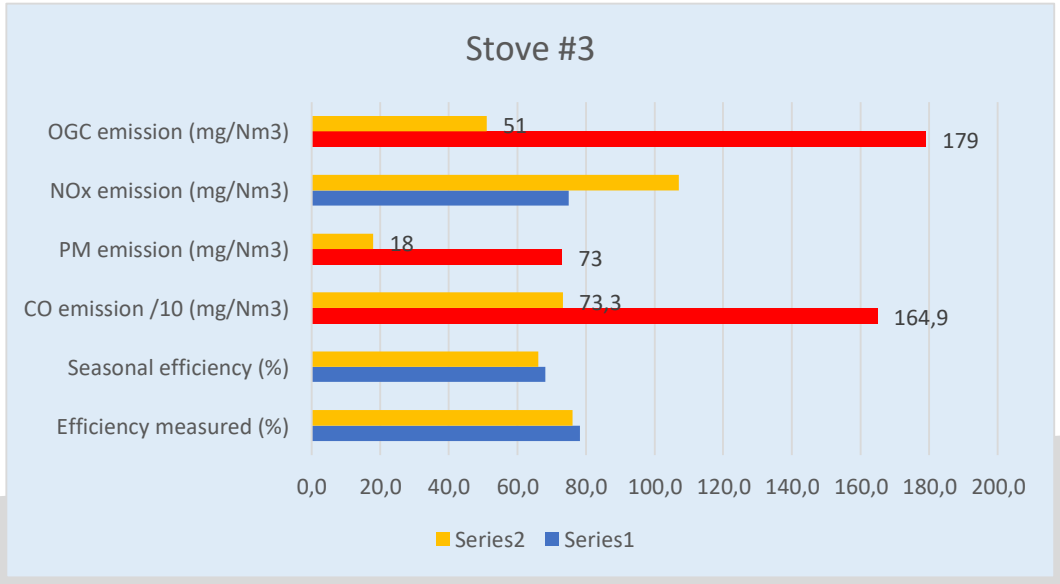
# OUTCOME OF THE FIRST ROUND

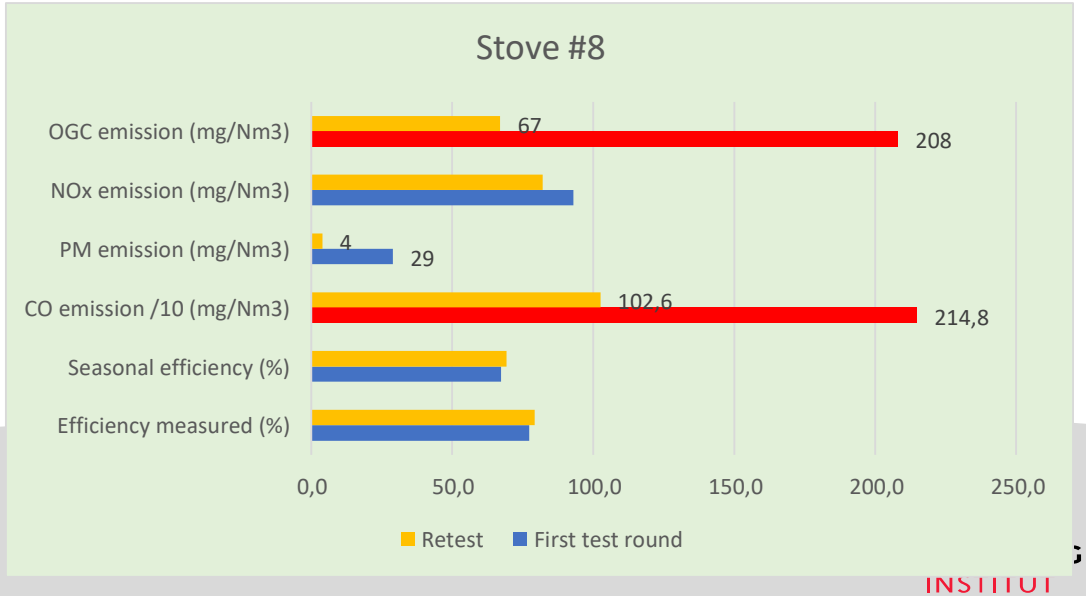
- 11 out of 15 stoves failed on one or more parameters
- 4 stoves were never in danger because the manufacturer had declated relative to the thresholds
- 5 stoves had solved their non compliance by resetting the declared values to those measured
- 6 stoves opted for retesting with presence of a staff member from the manufacturer

# RESULTS FROM THE SECOND ROUND

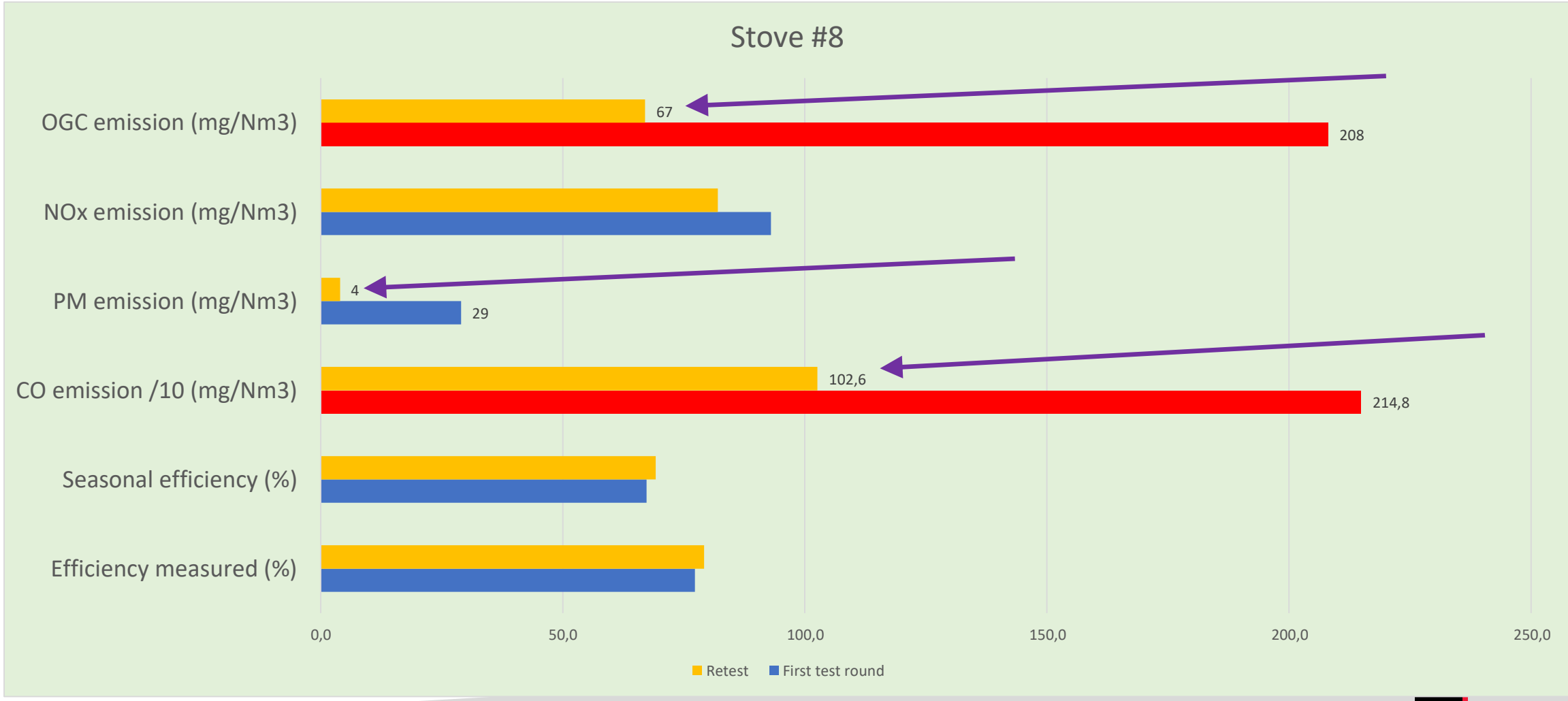






# CLOSE UP LOOK AT ONE STOVE

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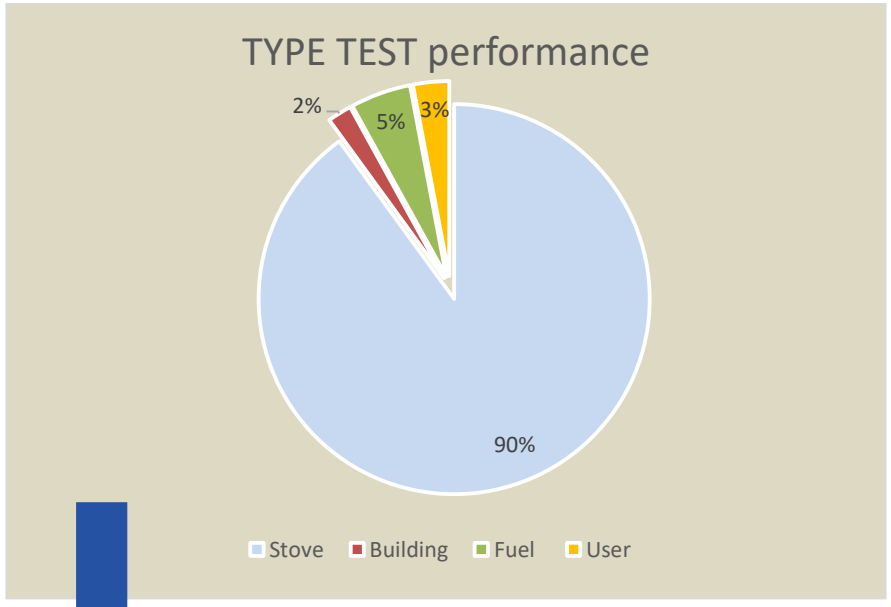
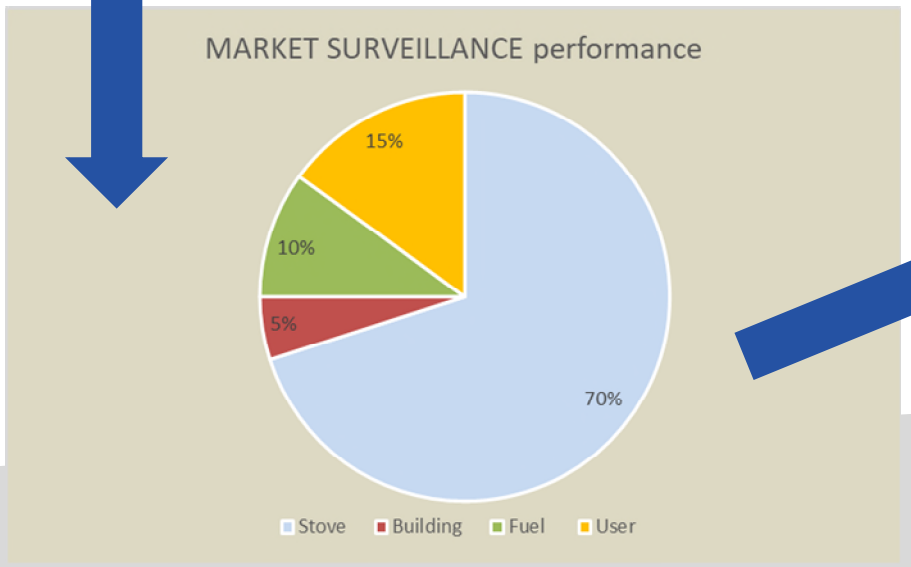
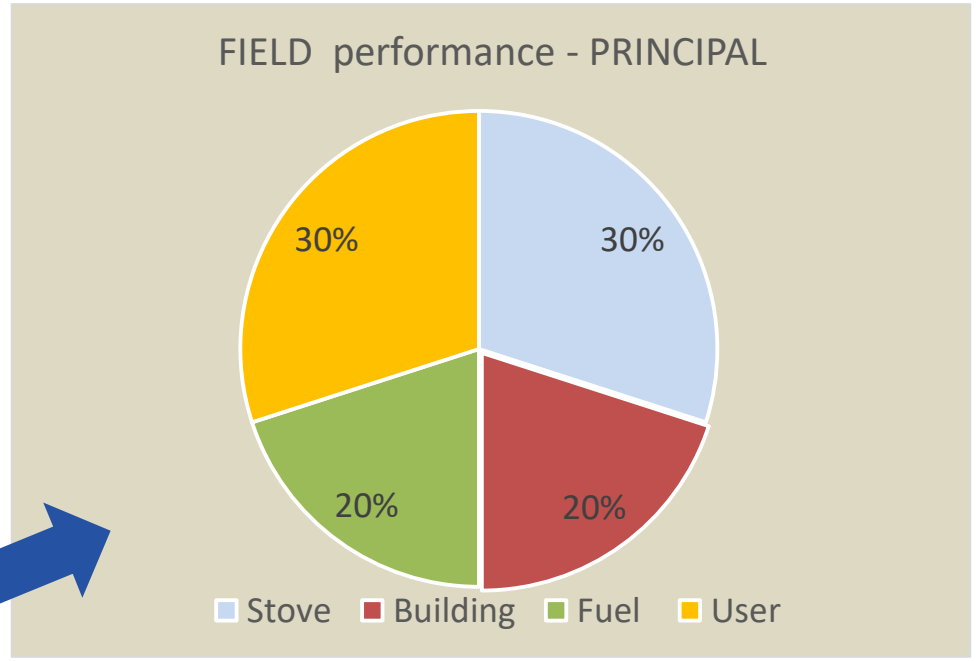
# FACTORS INFLUENCING STOVE PERFORMACE

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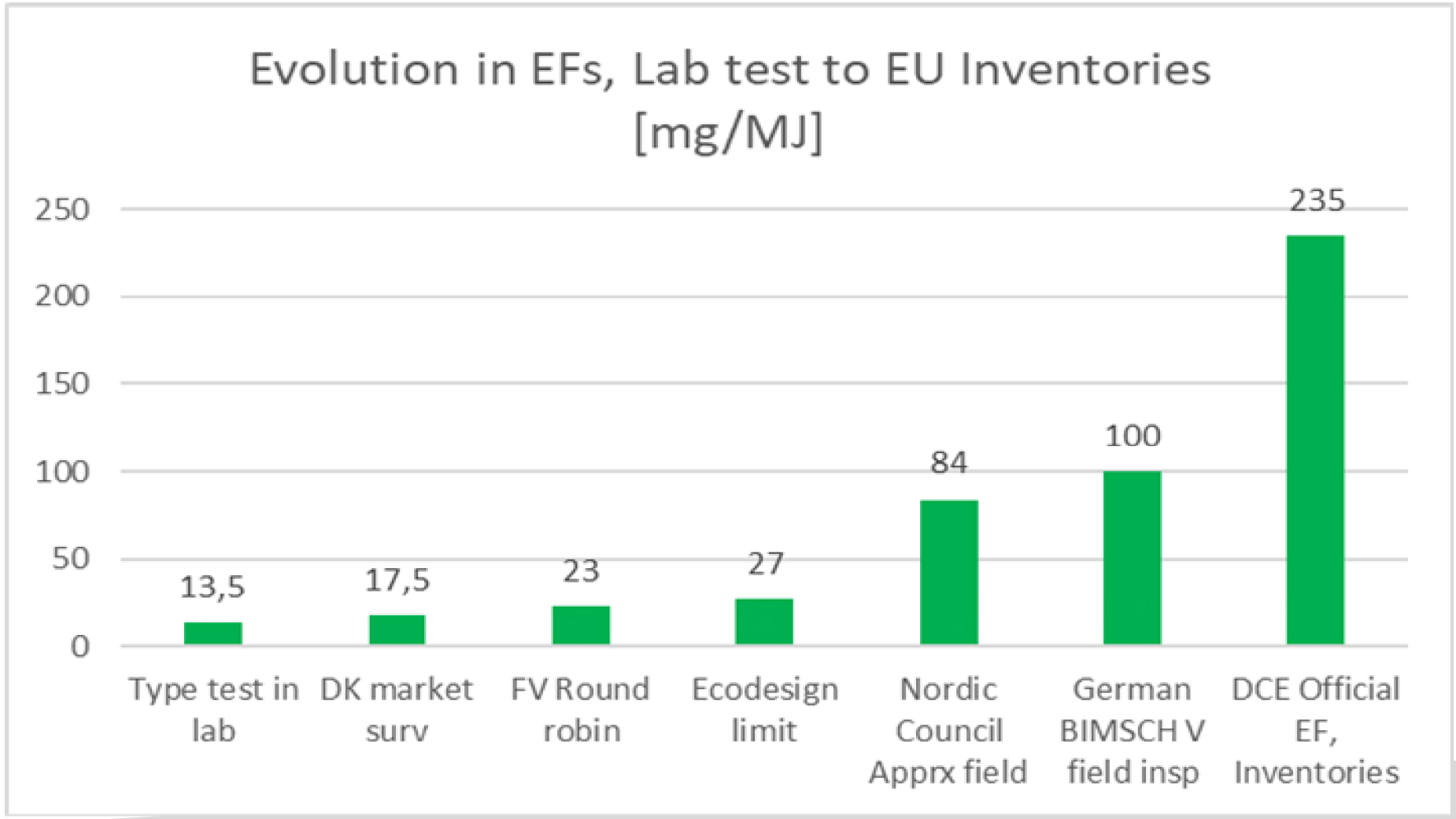
# EVOLUTION IN EFs LAB TO FIELD

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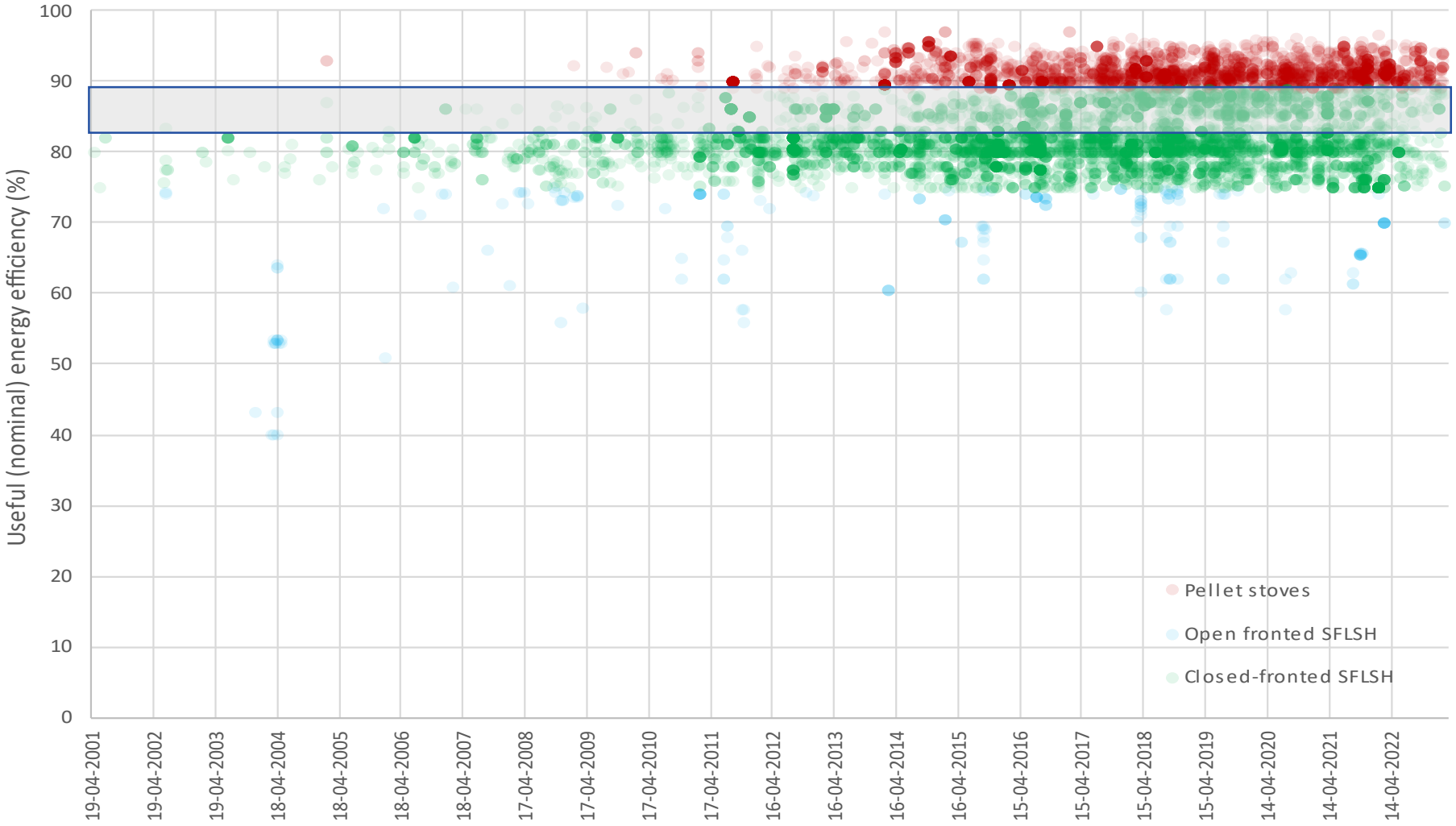
# FINDINGS

- POOR REPRODUCIBILITY OF BATCH OPERATED STOVES PERFORMACE
- THE CURRENT EN16510 TESTING APPROACH OFFERS A HIGH DEGREE OF FLEXIBILITY
- THERE ARE STONG INDICATIONS THAT THE HUGE VARIABILITY IN PERFORMANCE CONSUMES ALL OF THE ECODESIGN VERIFICATION TOLERANCES
- INTENSIVE MARKET SURVEILLANCE IS A MUST
- IT IS PROBLEMATIC HAVING DUAL REGULATION OF THE WOOD STOVE, CPR AND ECODESIGN WITH DIFFERENT CONFORMITY ASSESSMENT LEVELS
- THERE IS  AN URGENT NEED OF MAKING BATCH OPERATED WOOD COMBUSTION MORE ROBUST AGAINST MISUSE OR POOR OPERATION PRACTICES

# EPREL DATA ON USEFUL EFFICIENCY




There are 13710 post in EPREL in total

They descend from approximately 3400 unique tests

Pellets stoves has 89% efficiency as a minimum

There are not many wood stoves having more than 82-83% efficiency

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