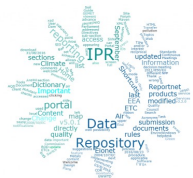# 10th IPR Technical Meeting-online
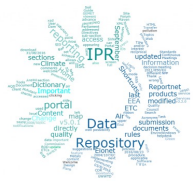
Jaume Targa– ETC/HE (4sfera)

New pollutants & reporting PM correction factor
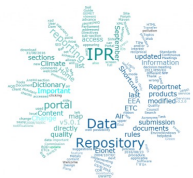
1   Reporting new pollutants

- Like other pollutants, we simply add a new code in the vocabulary

- However, we have "a challenge" with Ultra Fine Particles

- Possible way to report…

Given their small size and mass, UFPs are commonly measured either as number concentration or as size distribution per unit of volume (particles/cm^3).

- no standard methodology stablished

- the upper and lower size detection limits of the instruments vary greatly,

- definition of UFPs is sometimes used loosely referring to quasi-ultrafine particles to also include particles larger than 100 nm but substantially smaller than 1 μm

Given that UFPs are often in the smaller size range, UFPs represent 70-90% of the total particle number concentration (see e.g., Charron and Harrison, 2003) and the total number concentration can be assumed to be a good representation of that of UFPs.

Thus, **the most common approach to measure UFPs is to measure the total particle number concentration**.

Still, it is important to **specify the lower detection limit** of the measuring instrument used.

Concept: *Ultra Fine Particles (UFPs) - recommended unit: particles.cm-3* in the *pollutant* vocabulary

← Back to vocabulary

Concept URI	http://dd.eionet.europa.eu/vocabulary/aq/pollutant/6003
Preferred label	Ultra Fine Particles (UFPs) - recommended unit: particles.cm-3
Definition	Concentration of particles with less than 100 nanometers (10^-9 m) in diameter, measured as number of particles per volume
Notation	UFPs
Status	Valid
Status Modified	24.03.2022
Accepted Date	24.03.2022
Not Accepted Date	
Scope note	Added by Jaume Targa
Mandatory unit	particles.cm-3 (particles.cm-3) in uom/concentration

- Still, it is important to specify the lower detection limit of the measuring instrument used – in D!.
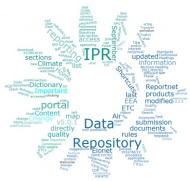
```
<aqd:dataQuality>
<aqd:DataQuality>
<aqd:detectionLimit
uom="http://dd.eionet.europa.eu/vocabulary/uom/concentration/nm">10.0</aqd:detectionLimit>
<aqd:documentation>In preparation</aqd:documentation>
<aqd:qaReport>http://uk-air.defra.gov.uk/inPreparation</aqd:qaReport>
</aqd:DataQuality>
</aqd:dataQuality>
```

- Maybe, we also need to add this in E1a… (to be discussed)
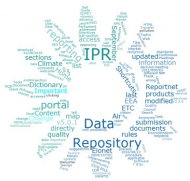
1   Reporting corrected automatic PM factor

- ## Why is this important?

    - Please note that we will leave correction of OZONE aside, for now…

- ## Your opinion?

- ## Possible way to report…

2   Why is this important?

- To be honest, we don't know how you are managing PM data coming from automatic equipment (none gravimetric)

- If you do, report this information in a report, IT IS VERY HARD TO FIND (as presented back in TIPR9)

TEOM-FDMS PM automatic equipment reported as reference ☹

```
<gml:featureMember>
  ▼<aqd:AQD_SamplingPointProcess gml:id="SPP-TEOM-FDMS_TEOM1400AB-FDMS_2421">
    ▼<ompr:inspireId>
      ▼<base:Identifier>
          <base:localId>SPP-TEOM-FDMS_TEOM1400AB-FDMS_2421</base:localId>
          <base:namespace>PT.APA.AQ</base:namespace>
      </base:Identifier>
    </ompr:inspireId>
    <ompr:type>Ambient air quality measurement instrument configuration</ompr:type>
         ...bleParty nilReason="reported in Header" xsi:nil="true"/>
         ...ntType xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/measurementtype/automatic"/>
         ...ntMethod>
         ...ementMethod>
         ...ementMethod xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/measurementmethod/TEOM-FDMS"/>
         ...ementMethod>
         ...ntMethod>
         ...ntEquipment>
         ...entEquipment>
         ...ent xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/measurementequipment/TEOM1400AB-FDMS"/>
         ...mentEquipment>
         ...entEquipment>
         ...ceDemonstration>
         ...nceDemonstration>
         ...lenceDemonstrated xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/equivalencedemonstrated/ref"/>
          <aqd:demonstrationReport>https://qualar.apambiente.pt/</aqd:demonstrationReport>
        </aqd:EquivalenceDemonstration>
      </aqd:equivalenceDemonstration>
    ▼<aqd:dataQuality>
      ▼<aqd:DataQuality>
          <aqd:detectionLimit uom="http://dd.eionet.europa.eu/vocabulary/uom/concentration/ug.m-3">0</aqd:detectionLimit>
          <aqd:documentation/>
          <aqd:qaReport>https://qualar.apambiente.pt/</aqd:qaReport>
      </aqd:DataQuality>
    </aqd:dataQuality>
    ▼<aqd:duration>
      ▼<aqd:TimeReferences>
          <aqd:unit xlink:href="http://dd.eionet.europa.eu/vocabulary/uom/time/hour"/>
          <aqd:numUnits>1</aqd:numUnits>
      </aqd:TimeReferences>
    </aqd:duration>
    ▼<aqd:cadence>
```

2   Why is this important?

```
▼<gml:featureMember>
  ▼<aqd:AQD_SamplingPointProcess gml:id="SPP-BETA_enviroMP2.5M_2286">
    ▼<ompr:inspireId>
      ▼<base:Identifier>
        <base:localId>SPP-BETA_enviroMP2.5M_2286</base:localId>
        <base:namespace>PT.APA.AQ</base:namespace>
      </base:Identifier>
    </ompr:inspireId>
    <ompr:type>Ambient air quality measurement instrument configuration</ompr:type>
    <ompr:responsibleParty nilReason="reported in Header" xsi:nil="true"/>
    <aqd:measurementType xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/measurementtype/automatic"/>
                                   d>
                                 hod>
             thod xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/measurementmethod/BETA"/>
             hod>
             od>
             ment>
             ipment>
             nk:href="http://dd.eionet.europa.eu/vocabulary/aq/measurementequipment/enviroMP2.5M"/>
             ipment>
             pment>
                                 stration>
    ▼<aqd:EquivalenceDemonstration>
        <aqd:equivalenceDemonstrated xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/equivalencedemonstrated/ref"/>
        <aqd:demonstrationReport>https://qualar.apambiente.pt/</aqd:demonstrationReport>
      </aqd:EquivalenceDemonstration>
    </aqd:equivalenceDemonstration>
    ▼<aqd:dataQuality>
      ▼<aqd:DataQuality>
          <aqd:detectionLimit uom="http://dd.eionet.europa.eu/vocabulary/uom/concentration/ug.m-3">0</aqd:detectionLimit>
          <aqd:documentation/>
          <aqd:qaReport>https://qualar.apambiente.pt/</aqd:qaReport>
        </aqd:DataQuality>
      </aqd:dataQuality>
    ▼<aqd:duration>
      ▼<aqd:TimeReferences>
          <aqd:unit xlink:href="http://dd.eionet.europa.eu/vocabulary/uom/time/hour"/>
          <aqd:numUnits>1</aqd:numUnits>
        </aqd:TimeReferences>
      </aqd:duration>
```
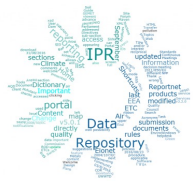
BETA PM automatic equipment reported as reference ☹

2   Why is this important?

- So, it is very hard for us to find out how your are managing your automatic data

- Do you provide it RAW, adjusted, Corrected??
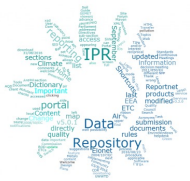
- Annual adjustment? One adjustment??

4   Possible way to report

- In the past… we had many discussion on where elements related to equipment should be reported

- Detection limit, uncertainty…
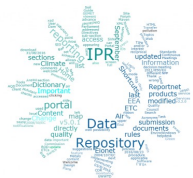
4 Possible way to report

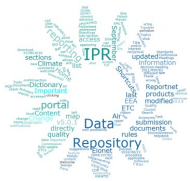- If we need to provide a declaration on the adjustment factor we use in PM. Where do we put it?

- Option A: in D, with meta-data
- Option B: in E1a/E2a with the raw data

4   Possible way to report – option A, with meta-data

- **Maybe easier to do.** One of exercise, like gathering information on inlet height

- Need to check if XML schema would allow a new element

- What happens if the adjustment factor changes over time

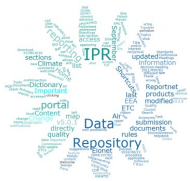- How to distinguish between E1a/E2a management, if different

- WE DON'T LIKE IT!

4   Possible way to report – option B, with data

- Harder. Need to keep inventory of adjustment factor used

- Can be accommodated in XML schema as other PROCESS PARAMETERS

- Adjustment value can vary on yearly basis

- Allow E1a/E2a management, separately

  - Up-To-Date could be provided without adjustment or preliminary

  - Primary data reported as FINAL adjustment

4 Possible way to report – option B, with data

```xml
<gml:featureMember>
  <om:OM_Observation gml:id="OBP-SPO-OC-LU0109A_00005_100_100">
    <om:phenomenonTime>
      <gml:TimePeriod gml:id="OBP_T-SPO-OC-LU0109A_00005_100_100">
        <gml:beginPosition>2020-01-01T00:00:00+00:00</gml:beginPosition>
        <gml:endPosition>2020-12-31T24:00:00+00:00</gml:endPosition>
      </gml:TimePeriod>
    </om:phenomenonTime>
    <om:resultTime>
      <gml:TimeInstant gml:id="OBP_D-SPO-OC-LU0109A_00005_100_100">
        <gml:timePosition>2021-09-22T11:50:18+00:00</gml:timePosition>
      </gml:TimeInstant>
    </om:resultTime>
    <om:procedure xlink:href="LU.AdmEnv_AirBruit.AQ/SPP-LU_Horiba_APDA371_PM10"/>
    <om:parameter>
      <om:NamedValue>
        <om:name xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/processparameter/AssessmentType"/>
        <om:value xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/assessmenttype/fixed"/>
      </om:NamedValue>
    </om:parameter>
    <om:parameter>
      <om:NamedValue>
        <om:name xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/processparameter/SamplingPoint"/>
        <om:value xlink:href="LU.AdmEnv_AirBruit.AQ/SPO-LU0109A_00005_100"/>
      </om:NamedValue>
    </om:parameter>
    <om:observedProperty xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/pollutant/5"/>
    <om:featureOfInterest xlink:href="LU.AdmEnv_AirBruit.AQ/SPO-F-LU0109A_00005_100_100"/>
    <om:result>
      <swe:DataArray>
        <swe:elementCount>
          <swe:Count>
            <swe:value>8784</swe:value>
          </swe:Count>
        </swe:elementCount>
        <swe:elementType name="FixedPrimaryObservations">
          <swe:DataRecord>
            <swe:field name="StartTime">
              <swe:Time definition="http://www.opengis.net/def/property/OGC/0/SamplingTime">
                <swe:uom xlink:href="http://www.opengis.net/def/uom/ISO-8601/0/Gregorian"/>
              </swe:Time>
            </swe:field>
            <swe:field name="EndTime">
              <swe:Time definition="http://www.opengis.net/def/property/OGC/0/SamplingTime">
                <swe:uom xlink:href="http://www.opengis.net/def/uom/ISO-8601/0/Gregorian"/>
              </swe:Time>
            </swe:field>
            <swe:field name="Value">
              <swe:Quantity definition="http://dd.eionet.europa.eu/vocabulary/aq/primaryObservation/hour">
                <swe:uom xlink:href="http://dd.eionet.europa.eu/vocabulary/uom/concentration/ug.m-3"/>
              </swe:Quantity>
            </swe:field>
            <swe:field name="Verification">
              <swe:Category definition="http://dd.eionet.europa.eu/vocabulary/aq/observationverification"/>
            </swe:field>
            <swe:field name="Validity">
              <swe:Category definition="http://dd.eionet.europa.eu/vocabulary/aq/observationvalidity"/>
            </swe:field>
          </swe:DataRecord>
        </swe:elementType>
        <swe:encoding>
          <swe:TextEncoding decimalSeparator="." tokenSeparator="," blockSeparator="@@"/>
        </swe:encoding>
        <swe:values> 2020-01-01T00:00:00+00:00,2020-01-01T01:00:00+00:00,63,1,1@@2020-01-01T01:00:00+00:00,2020-01-01T02:00:00+00:00,18,1,1@@2020-01-01T02:00:00+00:00,2020-01-01T03:00:00+00:00,18,1,1@@2020-01-01T03:00:00+00:00,2020-01-01T04:00:00+00:00,20,1,1@@2020-01-01T04:00:00+00:00,2020-01-01T05:00:00+00:00,17,1,1@@2020-01-01T05:00:00+00:00,2020-01-01T06:00:00+00:00,21,1,1@@2020-01-01T06:00:00+00:00,2020-01-01T07:00:00+00:00,17,1,1@@2020-01-01T07:00:00+00:00,2020-01-01T08:00:00+00:00,16,1,1@@2020-01-01T08:00:00+00:00,2020-01-01T09:00:00+00:00,20,1,1@@2020-01-01T09:00:00+00:00,2020-01-01T10:00:00+00:00,17,1,1@@2020-01-01T10:00:00+00:00,2020-01-01T11:00:00+00:00,13,1,1@@2020-01-01T11:00:00+00:00,2020-01-01T12:00:00+00:00,16,1,1@@2020-01-01T12:00:00+00:00,2020-01-01T13:00:00+00:00,17,1,1@@2020-01-01T13:00:00+00:00,2020-01-01T14:00:00+00:00,15,1,1@@2020-01-01T14:00:00+00:00,2020-01-01T15:00:00+00:00,18,1,1@@2020-01-01T15:00:00+00:00,2020-01-01T16:00:00+00:00,26,1,1@@2020-01-01T16:00:00+00:00,2020-01-01T17:00:00+00:00,20,1,1@@2020-01-01T17:00:00+00:00,2020-01-01T18:00:00+00:00,23,1,1@@2020-01-01T18:00:00+00:00,2020-01-01T19:00:00+00:00,37,1,1@@2020-01-01T19:00:00+00:00,2020-01-01T20:00:00+00:00,40,1,1@@2020-01-01T20:00:00+00:00,2020-01-01T21:00:00+00:00,38,1,1@@2020-01-01T21:00:00+00:00,2020-01-01T22:00:00+00:00,35,1,1@@2020-01-01T22:00:00+00:00,2020-01-01T23:00:00+00:00,39,1,1@@2020-01-01T23:00:00+00:00,2020-01-02T00:00:00+00:00,39,1,1@@2020-01-02T00:00:00+00:00,2020-01-02T01:00:00+00:00,28,1,1@@2020-01-02T01:00:00+00:00,2020-01-02T02:00:00+00:00,31,1,1@@2020-01-02T02:00:00+00:00,2020-01-02T03:00:00+00:00,26,1,1@@2020-01-02T03:00:00+00:00,2020-01-02T04:00:00+00:00,28,1,1@@2020-01-02T04:00:00+00:00,2020-01-02T05:00:00+00:00,19,1,1@@2020-01-02T05:00:00+00:00,2020-01-02T06:00:00+00:00,10,1,1@@2020-01-02T06:00:00+00:00,2020-01-02T07:00:00+00:00,10,1,1@@2020-01-02T07:00:00+00:00,2020-01-02T08:00:00+00:00,12,1,1@@2020-01-02T08:00:00+00:00,2020-01-02T09:00:00+00:00,10,1,1@@2020-01-02T09:00:00+00:00,2020-01-02T10:00:00+00:00,11,1,1@@2020-01-02T10:00:00+00:00,2020-01-02T11:00:00+00:00,16,1,1@@2020-01-02T11:00:00+00:00,2020-01-02T12:00:00+00:00,12,1,1@@2020-01-02T12:00:00+00:00,2020-01-02T13:00:00+00:00,9,1,1@@2020-01-02T13:00:00+00:00,2020-01-02T14:00:00+00:00,15,1,1@@2020-01-02T14:00:00+00:00,2020-01-02T15:00:00+00:00,14,1,1@@2020-01-02T15:00:00+00:00,2020-01-02T16:00:00+00:00,17,1,1@@2020-01-02T16:00:00+00:00,2020-01-02T17:00:00+00:00,13,1,1@@2020-01-02T17:00:00+00:00,2020-01-02T18:00:00+00:00,12,1,1@@2020-01-02T18:00:00+00:00,2020-01-02T19:00:00+00:00,14,1,1@@2020-01-02T19:00:00+00:00,2020-01-02T20:00:00+00:00,15,1,1@@2020-01-02T20:00:00+00:00,2020-
```
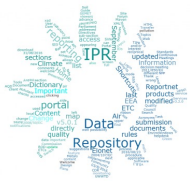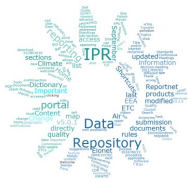
Jaume Targa – ETC/HE

```
▼<gml:featureMember>
  ▼<om:OM_Observation gml:id="OBP-SPO-OC-LU0109A_00005_100_100">
    ▼<om:phenomenonTime>
      ▼<gml:TimePeriod gml:id="OBP_T-SPO-OC-LU0109A_00005_100_100">
          <gml:beginPosition>2020-01-01T00:00:00+00:00</gml:beginPosition>
          <gml:endPosition>2020-12-31T24:00:00+00:00</gml:endPosition>
        </gml:TimePeriod>
      </om:phenomenonTime>
    ▼<om:resultTime>
      ▼<gml:TimeInstant gml:id="OBP_D-SPO-OC-LU0109A_00005_100_100">
          <gml:timePosition>2021-09-22T11:50:18+00:00</gml:timePosition>
        </gml:TimeInstant>
      </om:resultTime>
      <om:procedure xlink:href="LU.AdmEnv_AirBruit.AQ/SPP-LU_Horiba_APDA371_PM10"/>
    ▼<om:parameter>
      ▼<om:NamedValue>
          <om:name xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/processparameter/AssessmentType"/>
          <om:value xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/assessmenttype/fixed"/>
        </om:NamedValue>
      </om:parameter>
    ▼<om:parameter>
      ▼<om:NamedValue>
          <om:name xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/processparameter/SamplingPoint"/>
          <om:value xlink:href="LU.AdmEnv_AirBruit.AQ/SPO-LU0109A_00005_100"/>
        </om:NamedValue>
      </om:parameter>
      <om:observedProperty xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/pollutant/5"/>
      <om:featureOfInterest xlink:href="LU.AdmEnv_AirBruit.AQ/SPO_F-LU0109A_00005_100_100"/>
```

THIS IS NOT GUIDANCE!!
It is an idea to be discussed

```
▼<gml:featureMember>
  ▼<om:OM_Observation gml:id="OBP-SPO-OC-LU0109A_00005_100_100">
    ▼<om:phenomenonTime>
      ▼<gml:TimePeriod gml:id="OBP_T-SPO-OC-LU0109A_00005_100_100">
          <gml:beginPosition>2020-01-01T00:00:00+00:00</gml:beginPosition>
          <gml:endPosition>2020-12-31T24:00:00+00:00</gml:endPosition>
        </gml:TimePeriod>
      </om:phenomenonTime>
    ▼<om:resultTime>
      ▼<gml:TimeInstant gml:id="OBP_D-SPO-OC-LU0109A_00005_100_100">
          <gml:timePosition>2021-09-22T11:50:18+00:00</gml:timePosition>
        </gml:TimeInstant>
      </om:resultTime>
      <om:procedure xlink:href="LU.AdmEnv_AirBruit.AQ/SPP-LU_Horiba_APDA371_PM10"/>
    ▼<om:parameter>
      ▼<om:NamedValue>
          <om:name xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/processparameter/AssessmentType"/>
          <om:value xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/assessmenttype/fixed"/>
        </om:NamedValue>
      </om:parameter>
    ▼<om:parameter>
      ▼<om:NamedValue>
          <om:name xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/processparameter/SamplingPoint"/>
          <om:value xlink:href="LU.AdmEnv_AirBruit.AQ/SPO-LU0109A_00005_100"/>
        </om:NamedValue>
      </om:parameter>
```

```
<om:parameter>
<om:NamedValue>
<om:name xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/processparameter/PMadjustmentFactor"/>
<om:value>1.3</om:value>
</om:NamedValue>
</om:parameter>
```

```
<om:observedProperty xlink:href="http://dd.eionet.europa.eu/vocabulary/aq/pollutant/5"/>
<om:featureOfInterest xlink:href="LU.AdmEnv_AirBruit.AQ/SPO_F-LU0109A_00005_100_100"/>
```

THIS IS NOT GUIDANCE!!

It is an idea to be discussed

```
<swe:field name="Value">
  <swe:Quantity definition="http://dd.eionet.europa.eu/vocabulary/aq/primaryObservation/day">
    <swe:uom xlink:href="http://dd.eionet.europa.eu/vocabulary/uom/concentration/ug.m-3"/>
```

+ Specify whether adjusted or reference + adjusted factor

```
  </swe:Quantity>
</swe:field>
```

Automatic PM adjustment

Any comments?

Thank you for your attention!