

# Environment Meeting

## UN/CEFACT Forum October 2020

## Organizational remarks

- We are a small group - please feel free to speak up at any time
- Also feel free to use the chat
- Please mute your microphone while you don't speak
- Feel free to turn on your camera, especially while you speak
- We do not record this meeting
- Depending on the amount of discussion and remarks, we will either just add them to the slides, or create separate meeting notes

## Agenda

- Organizational Remarks & Round of Introduction
- UN/CEFACT Waste Management Project
  - Report of current status
  - Discussion of next steps
- UN/CEFACT Transboundary Movements of Waste (TMW) Standard
  - Report of current status
  - Discussion of next steps
- AOB, Project Ideas, Open Discussion

Any additions or changes to the agenda?

## Agenda

- Organizational Remarks & Round of Introduction
- UN/CEFACT Waste Management Project
  - Report of current status
  - Discussion of next steps
- UN/CEFACT Transboundary Movements of Waste (TMW) Standard
  - Report of current status
  - Discussion of next steps
- AOB, Project Ideas, Open Discussion

## Round of Introduction

- You... and
- Norbert Pfaffinger, Environment Agency in AT, UN/CEFACT Domain Coordinator
- Franz Mochty, Ministry of Environment in AT, Head of Electronic Data Management

## Waste Management Project – What is it about?

- Subject: **Handling of waste** – including treatment, storage and transport
- Challenge: **Risk of adverse effects to human health** and the **environment**
- Project purpose:
  - **Improve electronic interoperability**
  - Quick and reliable availability of detailed structured information to waste handling related parties
- Overall goals:
  - **Increase waste management efficiency**
  - **Improve waste management quality**
  - **Improve waste management supervision and control**

## Waste Management Project – Waste characterization

- Of particular interest in this project: **Waste characterization**
- **Waste characterization** is a thorough analysis of a batch or stream of waste
- Typical contents of waste characterization reports/results include:
  - **Hazardousness classification** – which, if any, hazard properties - toxic, explosive, ... - apply?
  - **Pollutant concentrations** – which amounts of (hazardous) substances, such as Cadmium, does the waste contain?
  - **Leaching behavior** – which amounts of (hazardous) substances dissolve from the waste through contact with water or other liquids
  - **Other properties** – such as pH value, electric conductivity, acid neutralization capacity

## Waste Management Project – why EDI for waste characterization

- Waste characterization results contain a **large number of data elements**
- Waste characterization results are the **basis for decisions** on what to do with the waste
- Waste characterization results **currently lack interoperability content-wise**:
  - Lack comparability if not determined following a **standardized set of procedures**
  - Procedures include **sampling, sample preparation and measurement**
- Waste characterization results **currently lack interoperability format-wise**:
  - Typically **not available as structured data**, but as printed/printable/scanned documents only
  - **Huge automation potential with structured data** - for instance comparing results with limit values



## Waste Management Project – why EDI for waste characterization

- Waste characterization results contain a **large number of data elements**
- Waste characterization results are the **basis for decisions** on what to do with the waste
- Waste characterization results **currently lack interoperability content-wise**
  - Lack comparability if not determined in a similar way
  - Procedures include **sampling, sampling frequency, sampling location**
- Waste characterization results **currently lack interoperability format-wise**
  - Typically **not available as structured data** but as printed/printable/scanned documents only
  - **Huge automation potential with structured data** - for instance comparing results with limit values

Another example for the automation potential: **AI** may suggest well-suited treatments for a particular batch or stream of waste, based on how similar batches or streams of waste have been treated before

## Waste Management Project – waste characterization

- The **process of waste characterization often involves multiple parties**, such as:
  - waste holder, who initializes the process
  - parties taking samples (and authorized / certified for doing so)
  - parties testing samples (and authorized / certified for doing so, e.g. certified laboratories)
- These processes involve the exchange of information between these parties
- Conclusion:
  - With regard to digitalization it is **not only the results of waste characterization which are of interest**
  - It is **also the information exchanged beforehand**, during the process of waste characterization
  - Example: Initial waste information provided by the waste holder



## Waste Management Project – Scope Remark

- The scope of the project goes well beyond waste characterization (see previous slide)
- However: waste characterization definitely is the most challenging part of the project

## Waste Management Project – Challenge Example

- One important example for the challenges with waste characterization and its results:  
**Measurement Uncertainty**
- For the correct interpretation of results, it is important to know on how precise they can be expected to be
- Precision in practice has often been indicated by the way in which a number is written:
  - Example: 30.00 would indicate a more precise result than 30.0
  - Challenge: Number datatypes don't work that way – 30.00 and 30.0 interpreted as the exact same number

## Waste Management Project – Measurement Uncertainty

- Since 1993, ISO “GUM” – Guide to the Expression of Uncertainty in Measurement
  - Example: 10.94 mg/l  $\pm$  0.03 mg/l (10.94 mg/l: “*estimate*”; 0.03 mg/l: “*expanded measurement uncertainty*”)
- German Waste Testing Method Collection (LAGA Methodensammlung) 2016

Sample ID	Parameter	Specification	Numeric Value	Expanded Uncertainty	Coverage Factor (k)	Unit	Measurement Method
P675	MKW	C 10 – C 22	350	50	2	mg/kg TM	DIN EN 14039

- corresponds to 350 mg/kg  $\pm$  50 mg/kg

## Waste Management Project – Measurement Uncertainty

- CEN Implementation of Measurement Uncertainty in European Standards
  - *Every new or revised European Standard including a measurement method or a test method providing quantitative results must address measurement uncertainty. A process for uncertainty evaluation or, if not possible, values of precision (i.e. repeatability and reproducibility) should normally be included.*

## CEN Uncertainty Leaflet, 2003

# Important information to our customers concerning the quality of measurements

### 1 *Do you use results of chemical analyses as a basis for your decisions and judgements?*



Those of us working in accredited laboratories or dealing with issues concerning the quality of measurements, would like to inform you about some important changes concerning the way the results of measurements are presented. These changes make it easier for you as an end-user to make correct decisions.

### 2 *Nobody is perfect!*



Results of analyses cannot be perfect! We hope this does not come as a big surprise to you. We use the term **measurement uncertainty** to describe this lack of perfection.

### 3 *The analytical process*

In each step of the analytical work, from sampling to the final measurement, deviations from the true value occur and measurement conditions vary. We take measures and perform controls regularly to assure that these deviations and variations together are small enough to make sure the end result fulfils your requirements. When we don't have full information about all of the steps, e.g. when sampling and initial sample preparation are performed by you as a customer, you can assist us by providing detailed information about how that work was performed. Our experts are ready to advise on all matters regarding sampling. Please contact the laboratory beforehand.



### 4 *Results should be fit-for-the-purpose*



The accuracy of the results must of course not be too low nor too high since this would increase the costs. It should be fit for the intended purpose. If you are unsure on what level of accuracy you need, do not hesitate to contact the laboratory.



## CEN Uncertainty Leaflet, 2003

### 5 Uncertainty and limiting values

Many analyses are made to assure that limiting values are not exceeded. Without information about the measurement uncertainty it may appear to be very easy to make decisions, but these decisions may be incorrect, with, e.g. economical consequences when rejecting instead of accepting a product, judicial consequences when returning a verdict of guilty instead of not guilty, or medical consequences when carrying out an unnecessary treatment. There are numerous examples!



A result with and without  
measurement uncertainty

With a realistic measurement uncertainty the information included in the result becomes much more useful.

### 7 What could it look like?

When reporting the test result we will give the normal information about what we have measured. When the results are followed by uncertainty statements, they are presented as intervals within which the true values are expected to lie with a certain level of confidence (usually 95%). In the example below the lead content is  $1.65 \pm 0.15 \text{ mmol} \cdot \text{kg}^{-1}$ , that is between 1.50 and 1.80. The measurement uncertainty is also often reported relatively, in %.

Total lead content (Pb)	$1.65 \text{ mmol} \cdot \text{kg}^{-1}$
Measurement uncertainty	$0.15 \text{ mmol} \cdot \text{kg}^{-1}$ (9.1%)

The stated uncertainty is an expanded measurement uncertainty ( $U$ ). It was obtained by multiplying the combined standard uncertainty  $u_c$  with a coverage factor  $k$  equal to 2. This corresponds approximately to a 95 % confidence interval.

### 6 It will be easier to compare results



Most laboratories have until now chosen not to state measurement uncertainty in the test report. Instead, such information has only been given when the customer has asked for it.

Information about the measurement uncertainty will be given on request.

In the future, information about the measurement uncertainty will appear more frequently in the test report. It is also possible that you will bump into new and unfamiliar quality terms. This is due to the fact that there are new international guides and standards describing a common and partly new terminology. One of the objectives is to make it easier for you as a customer to compare test results.

### 8 All's well that ends well...

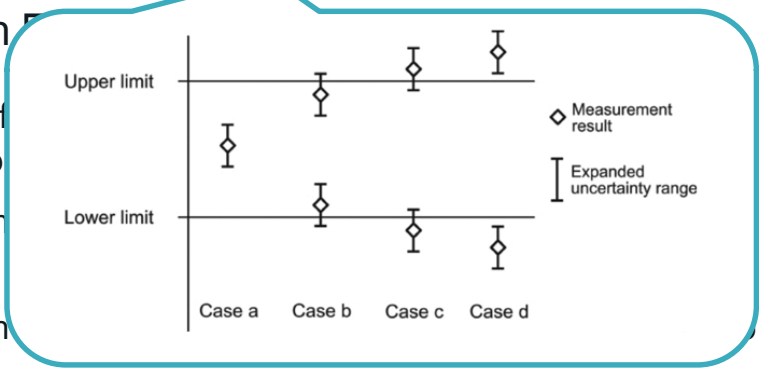


The requirements for a consistent way of reporting test results are increasing. Therefore, those of us involved in measurements are eager to assure ourselves that we understand your needs. You will notice this in your contacts with us before, during and after the test assignment. We hope that you will be satisfied with the final result.

## Waste Management Project – Measurement Uncertainty

- Challenges relatively independent of EDI/digitalization:
  - Can we assume/achieve consensus on a unique way of expressing new testing results, including expressing uncertainty following GUM?
  - Can we assume/achieve consensus on a unique way of further processing such results, such as in the comparison of results with limit values?
- Challenges with EDI/digitalization:
  - Do other ways of expressing testing results need to be supported as well, such as for representing “old” results, which come without uncertainty information?
  - How to deal with “old” results, wherein precision is expressed with the way numbers are written (significant figures)?
  - How to deal with results with missing/incomplete uncertainty information in further processing?

## Waste Management Project – Measurement Uncertainty

- Challenges relatively independent of EDI/digitalization:
  - Can we assume/achieve consensus on a unique way of expressing new testing results, including expressing uncertainty following GUM?
  - Can we assume/achieve consensus on a unique way of further processing such results, such as in the comparison of results with limit values?
- Challenges with 
  - Do other ways of expressing results, which could be as well, such as for representing “old”
  - How to deal with the way numbers are written (significant figures)?
  - How to deal with information in further processing?

## Waste Management Project – Measurement Uncertainty

- Challenges relatively in

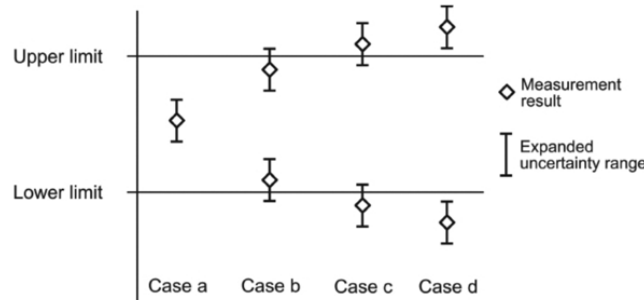
Includes further processing such as calculating a mean from the results of multiple samples

Rule example: 80% rule - limit value regarded as not exceeded if values exceeded for at most 1 out of 5 laboratory samples

- Can we assume/achieve consensus on a unique way of expressing new testing results, including expressing uncertainty following GUM?
- Can we assume/achieve consensus on a unique way of further processing such results, such as in the comparison of results with limit values?

- Challenges with

- Do other ways of representing results, which could be as well, such as for representing “old”
- How to deal with the way numbers are written (significant figures)?
- How to deal with information in further processing?



## Waste Management Project – Measurement Uncertainty

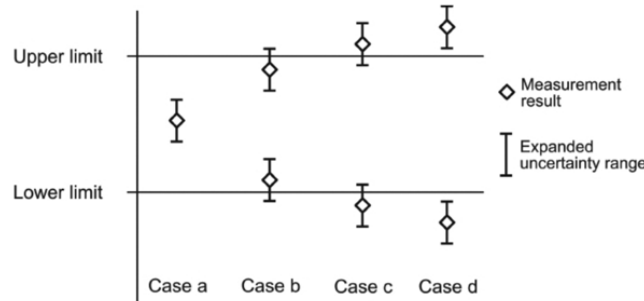
- Challenges relatively in

- Can we assume/achieve consensus on a unique way of expressing new testing results, including expressing uncertainty following GUM?
- Can we assume/achieve consensus on a unique way of further processing such results, such as in the comparison of results with limit values?

Quite likely: No, we cannot assume a unique way.  
Under different regulations different ways of processing may have to be followed.  
However: We can name/describe „default methods“, in order to support moving towards standardized methods and comparability/interoperability.

- Challenges with

- Do other ways of representing results, which could be useful as well, such as for representing “old” data?
- How to deal with uncertainty in the way numbers are written (significant figures)?
- How to deal with uncertainty in further processing?



## Waste Management Project – Measurement Uncertainty

- UN/CEFACT CCL:
  - Covers numerous types of measurement results
  - Despite GUM existing since 1993, “measurement uncertainty” is not yet found in CCL
  - Only related (but also rarely used) term “tolerance”
  - We therefore plan to introduce measurement uncertainty to the CCL with our submission

Project Inception
Requirements gathering
Draft development
Public Draft Review
Project Exit
Publication

## Waste Management Project – Status

- In phases “Requirements Gathering” and “Draft Development”
- Most advanced deliverable right now: BRS (Business Requirements Specification)
  - Example: Collection of more than 140 waste management business terms, including e.g. *leaching*
  - Example: Collection of around 20 specific data requirements
  - Classification into 5 types of business partners
  - So far identified 10 types of business entities
  - So far identified 10 types of business transactions

Project Inception
Requirements gathering
Draft development
Public Draft Review
Project Exit
Publication

## Waste Management Project – Next Steps

- We continue to gather requirements and develop the drafts (BRS, RSM)
- Input by waste management experts welcome at any stage
  - also before the Public Draft Review phase
  - we are happy to share intermediate results
  - see also UN/CEFACT project workspace at <https://uncefact.unece.org/> (requires registration)
- We will submit a request of an extension of milestones to UN/CEFACT
  - We expect draft development to take until May 2021



## Waste Management Project – Conclusion

- Road to interoperability more long-winded than with some other projects
  - As there is a long way to go in terms of domain-level harmonization independent of digitalization
  - The benefits of limiting effects on the environment and the human health, and of increasing efficiency, are however definitely worth going down that road

# Waste Management Project – Open Discussion

# Transboundary Movements of Waste (TMW) Standard

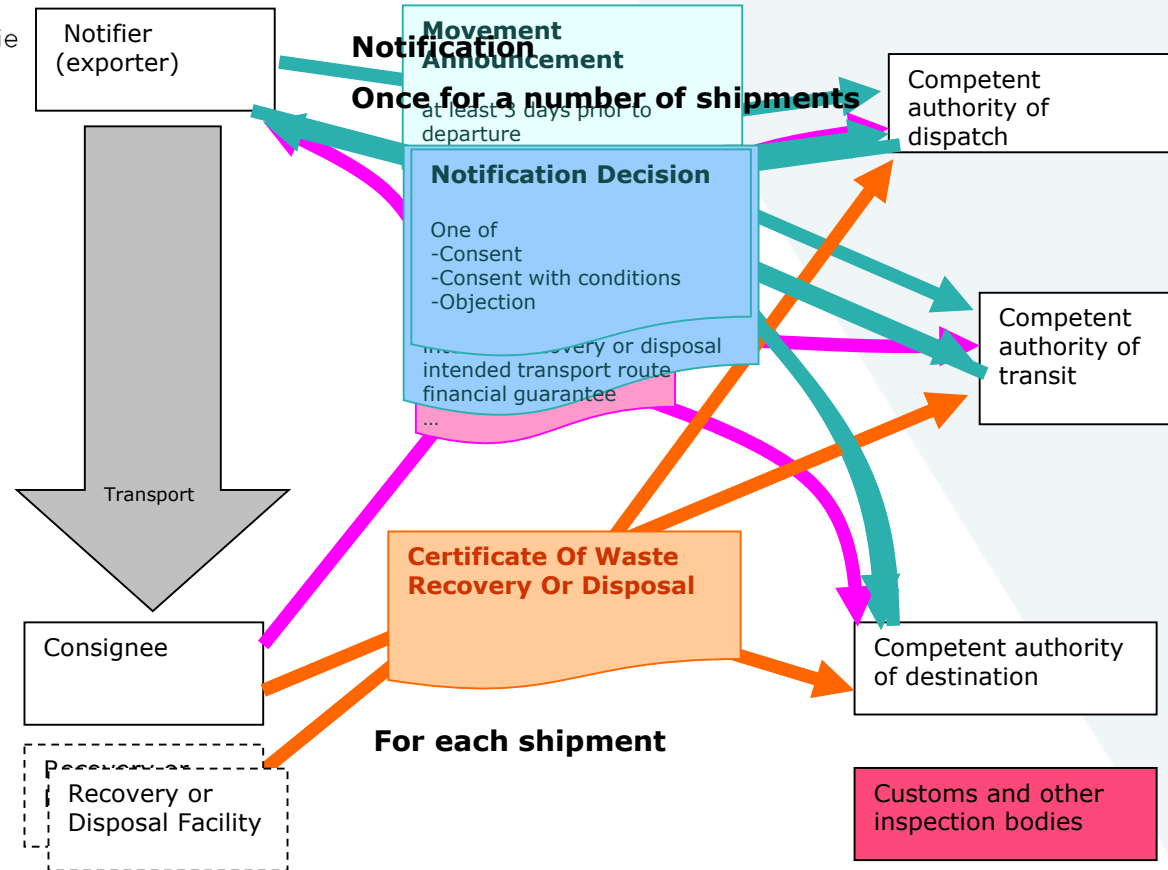
## What it is about?

- Basel Convention
  - limit and control of transboundary movements of hazardous and other wastes
  - in order to protect human health and the environment
- TMW Standard
  - means for an interoperable electronic implementation of the control procedures
  - control procedures can be conducted more efficiently
  - information available much faster, more reliably, and suited for automated processing
  - this has a large potential for improving the effectiveness of environmental control

## TMW Standard – Legal Background

- Basel Convention, [www.basel.int](http://www.basel.int)
  - on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal
- OECD Decision C(2001)107/FINAL
  - on the Control of Transboundary Movements of Waste destined for Recovery Operations
- EU Regulation 1013/2006
  - on shipments of waste

# TMW Standard – Domain Background



## TMW Standard – Recent developments - Overview

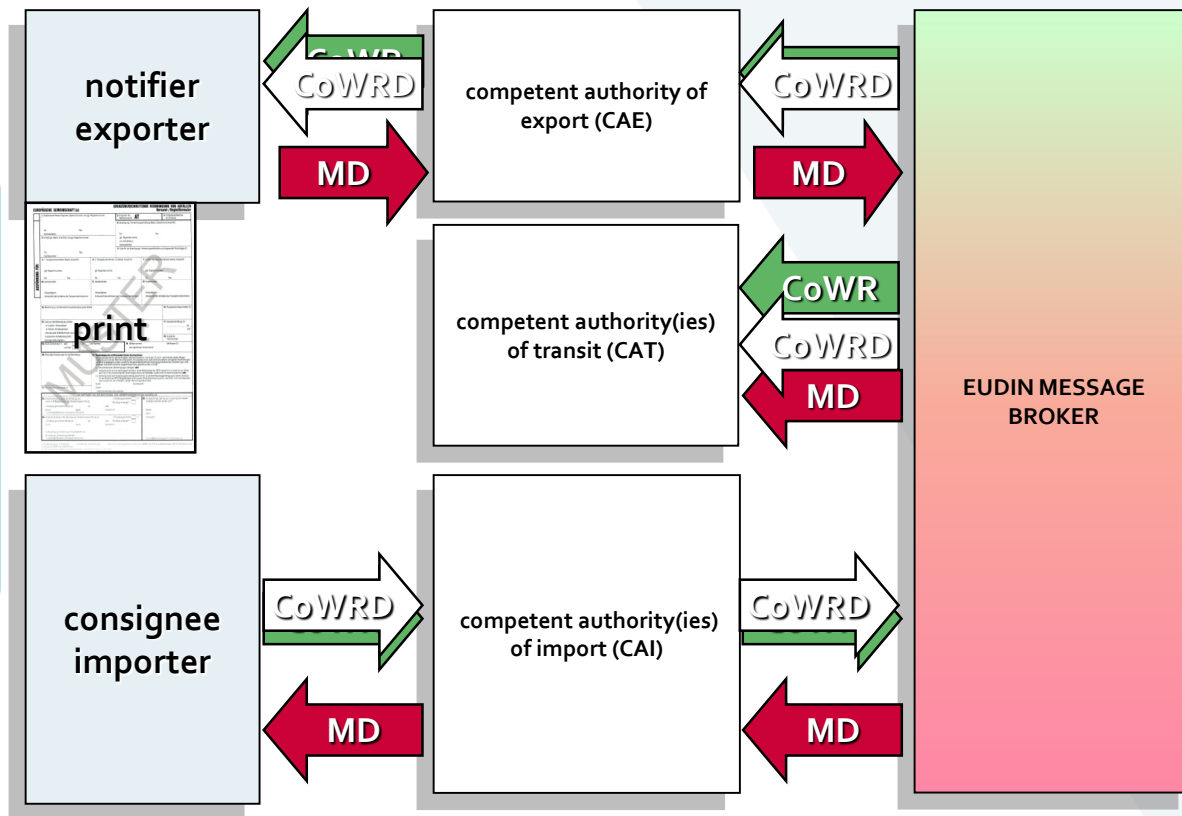
- Use in EUDIN – data interchange between CH and AT
- EC DG ENV – development of an EU-wide solution
- Interrelationship with EC DG MOVE eFTI – “Electronic Freight Transport Information”
- Basel Electronic Approaches

# EUDIN principle: Message Broker

One of the main advantages of this principle:

Trusted communication without a need for a new central registration

As a new central registration would be difficult to achieve on a global level



## TMW Standard – EUDIN recent development

- Full productive use for all shipments between AT and CH since July 2020
- Before used in pilot phase since 2017 for ~50% of the shipments



## TMW Standard – EC DG ENV EU Solution

- “Correspondents’ Guidelines No 11” published in July 2019
- XML Data Format for the exchange of waste shipment information in the EU
- Based on UN/CEFACT TMW, slightly extended following new requirements

## TMW Standard – EC DG ENV EU Solution

- Summer 2020: EC prepares extension of TRACES.NT solution for waste shipments
- Principle:
  - Web application for anyone not using a software with a (direct or indirect) EDI connection to the EU solution
  - Message broker web service interface for parties working with software with an EDI connection, such as Swiss “VeVA-Online” or Austrian “EDM”
- Phase 1: Exchange of unstructured notification related information between CAs only
- Extended in further phases to structured data and individual transport information
- Introductory virtual workshop by EC DG ENV on 21 October 2020
- Testing expected to start in November 2020

## TMW Standard – EC DG ENV EU Solution

- Summer 2020: EC prepares extension of TRACES.NT solution for waste shipments
- Principle:
  - Web application for anyone not using a software with a (direct or indirect) EDI connection to the EU solution
  - Message broker web service interface for parties working with software with an EDI connection, such as Swiss “VeVA-Online” or Austrian “EDM”
- Phase 1: Exchange of unstructured data following Correspondents' Guidelines No 11 between CAs only
- Extended in further phases to structured data and individual transport information
- Introductory virtual workshop by EC DG ENV on 21 October 2020
- Testing expected to start in November 2020

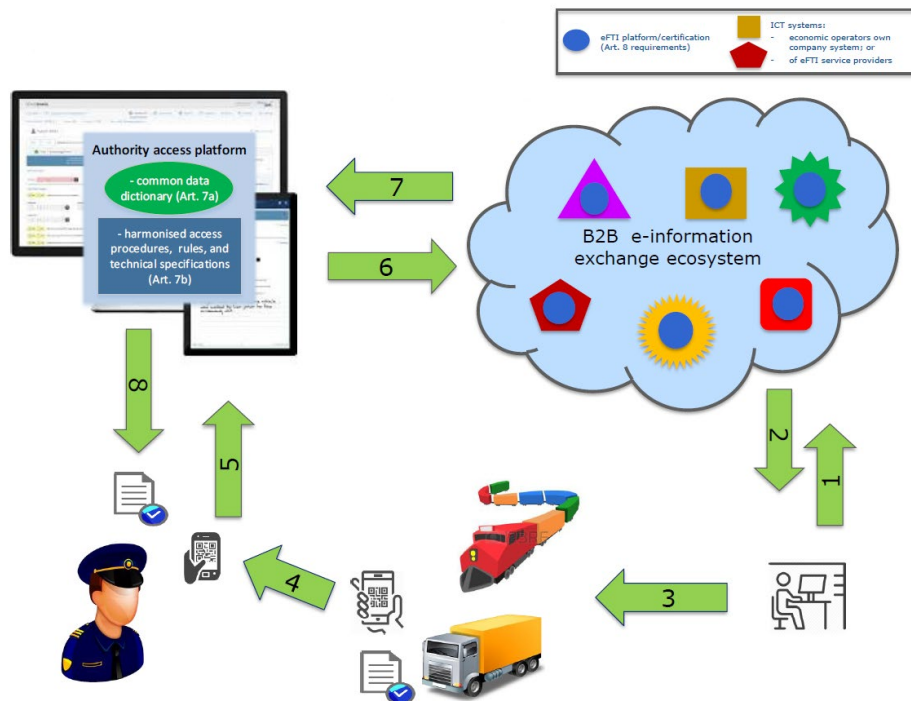
## TMW Standard – Basel Electronic Approaches

- Twelfth meeting of the Open-ended Working Group of the Basel Convention, Sep 2020:  
Report on Electronic Approaches Presented – available for download at [basel.int](https://www.basel.int)

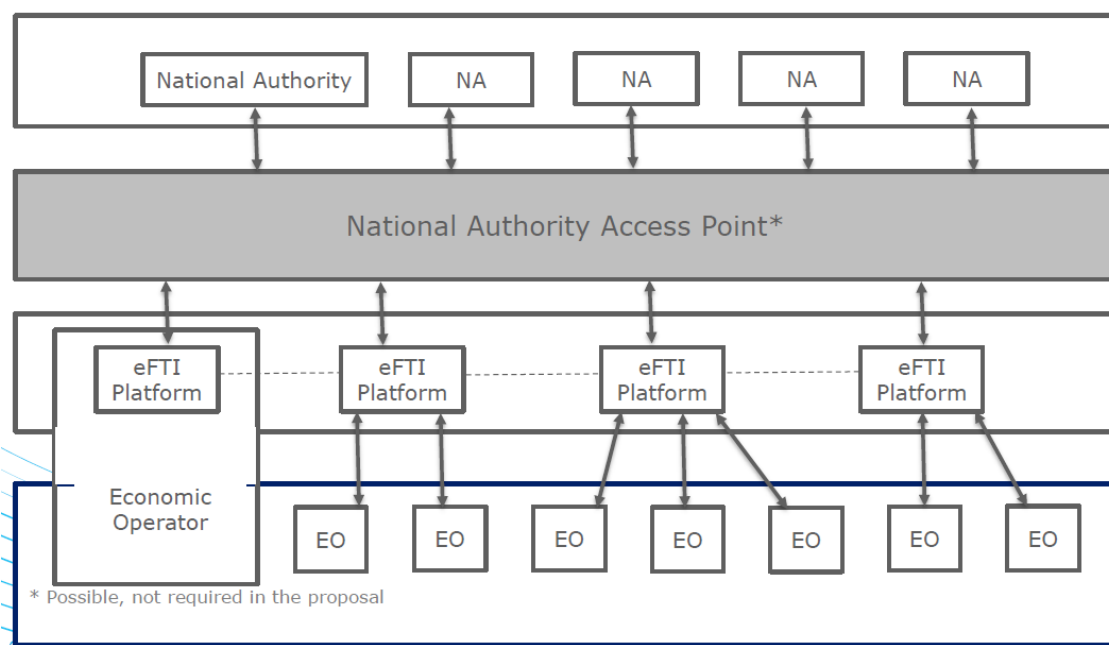
## TMW Standard - eFTI

- EU “Electronic Freight Transport Information Regulation” 2020/1056
- Topic: Authorities controlling transports
- Principle:
  - **Right** for economic operators to present transport related information **electronically** to authorities
  - **Obligation** for authorities to accept transport related information electronically
- Explicitly affects:
  - Presentation of waste shipment notification and movement document at controls during the transport
  - Waste shipment (B2A) information exchange before and after transport not covered by eFTI

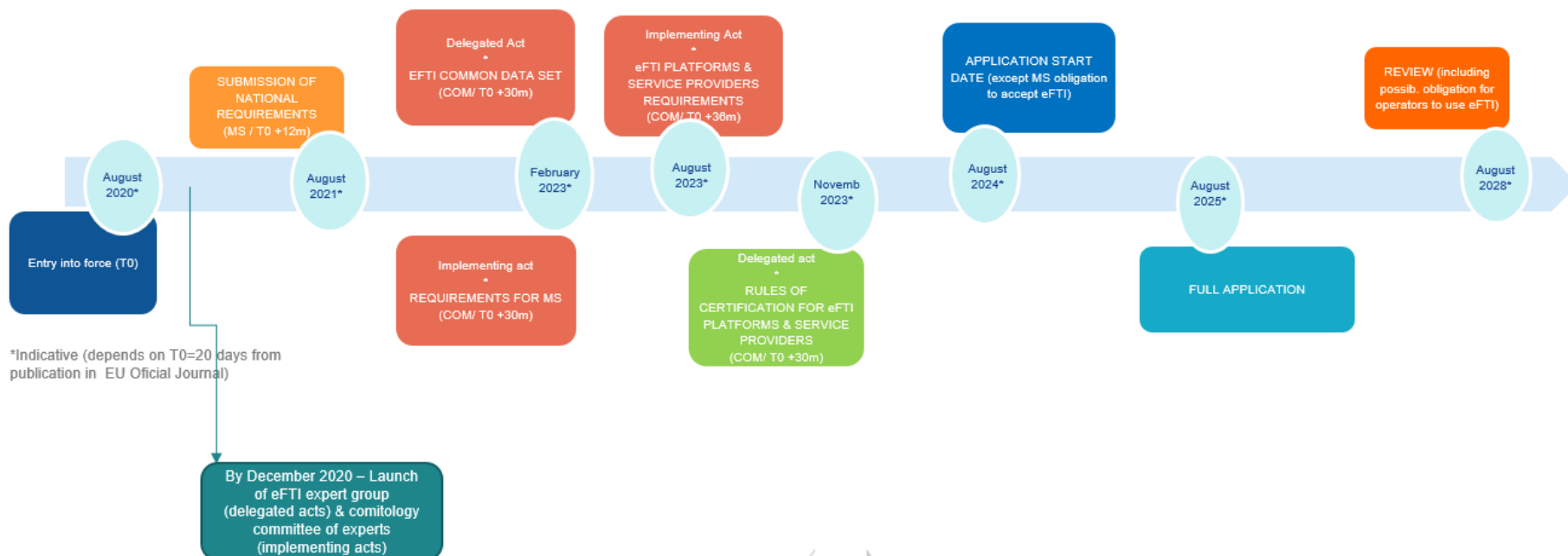
## TMW Standard – eFTI Information Flow



## TMW Standard – eFTI Architecture



## TMW Standard – eFTI Timeline





## TMW Standard - eFTI

- DTLF Subgroup 1 prepares technical drafts and recommendations
- Basis for later development of eFTI Delegated Acts
- “Functional Aspects” Workshops – second workshop was held 7 October 2020
- The interoperation of Waste Shipment electronic solutions – including TRACES.NT – and eFTI will be drafted in a special Waste Shipment Workshop
- Waste Shipment foreseen to be held in Oct / Nov 2020 – invitation not yet sent
- UN/CEFACT and DG ENV represented in DTLF working groups

## Roundup & Discussion

**Thank you for joining!**