



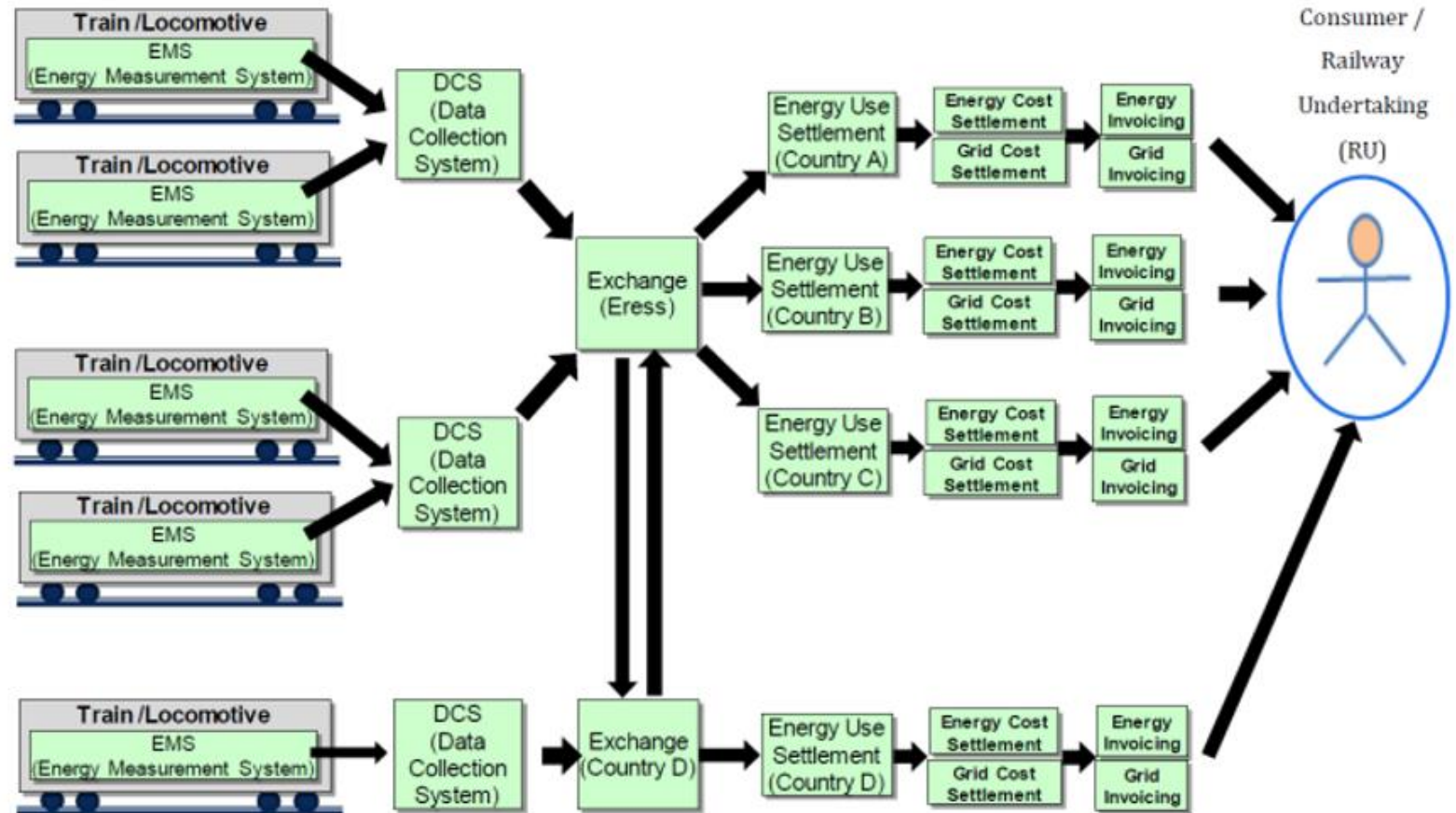
# Exchange of energy data in Europe

Bart Van der Spiegel, Infrabel

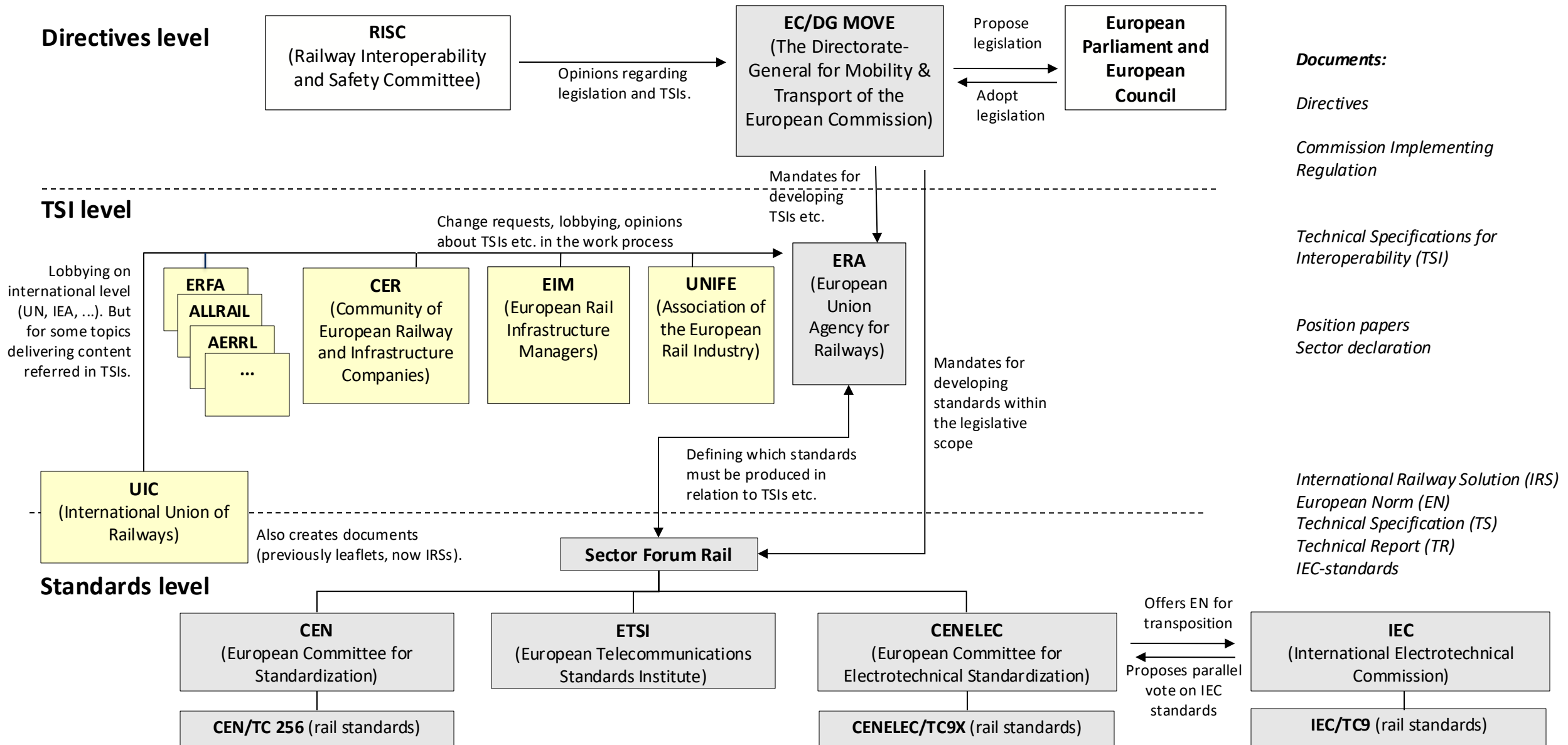


## Status of standardisation in Europe

1. EN 50463
2. IRS 90930
3. Hybrid trains



# Who is who?

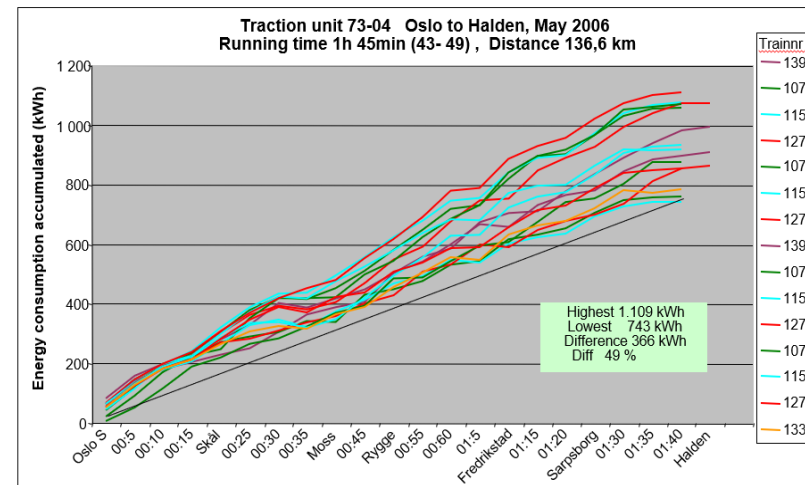


- Germany and Norway had meters on-board of trains
- Germany considered it mandatory to be able to invoice electricity. Norway considered that there was a huge opportunity to save energy.
- A symposium on Railway Energy Billing in October 2005 was a catalyst.
- In November 2005 the UIC project started. European Commission also started thinking.

## Railway Energy Settlement System

We need to solve:

- Cross border train traffic
- Dynamic (energy) price areas
- Train consumption, time schedule and position connected to the market price – each hour
- Deadline for reporting energy consumption
- Exchanging energy consumption between infrastructure owners



Famous comparison of train-runs on Oslo-Halden, May 2006



Presentation of Jan Vetle Moen, NSB, September 2007

# I. EN 50463: history

- Started on request of European Commission and ERA in 2007
- TSI LOC&PAS of 2011 included some requirements of draft EN 50463 in an annex
- First edition of EN 50463 series published in 2012
- TSI LOC&PAS and TSI ENE of 2014 referred to EN 50463:2012
- An interface between two TSIs shall be uniquely defined.
- Second edition of EN 50463 series published in 2017
- Adjusted versions of TSIs from 2018 refer to this updated EN 50463 series



# I. EN 50463 and IEC 62888

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- Following Frankfurt agreement, CENELEC offered EN 50463 to IEC
- The first edition of IEC 62888 was published in 2018
- The draft-version of second edition of IEC 62888 has got a review this spring
- On longer term only one EN IEC 62888 should remain.
- But there are still too many differences. A major difference is that the EN 50463:2017 refers to the EN 50155:2017 that doesn't have an updated IEC equivalent. The edition 2017 is not yet offered to IEC. This upgrade of EN 50155 caused that most EMS manufacturers has made completely new EMS to be compliant with the EN 50463:2017.
- The IEC group has corrected some bugs and unclarities found during first implementations of EN 50463 and also made many improvements (e.g. adding communication protocols HTTPS and SFTP having a secure layer).

# I. EN 50463: start of new Working Group 37

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- June 2023: request to start new Working Group to revise EN 50463
- July – October 2023: preparation of scope (New Work Item Proposal)
- November 2023: approval to start the revision
- Aim of this revision of EN 50463 is to publish a new version in parallel with IEC 62888.
- 38 members from 12 National Committees (incl. 2 observers from ERA)
- Task leaders for the 5 parts:
  - EN 50463-1: Etienne Sourdille and Hamou Benhabib
  - EN 50463-2: Björn Allebrand
  - EN 50463-3: Gunn-Helene Krogstad
  - EN 50463-4: Francesco Sperotto
  - EN 50463-5: Andrea Gatti

# I. EN 50463: main topics

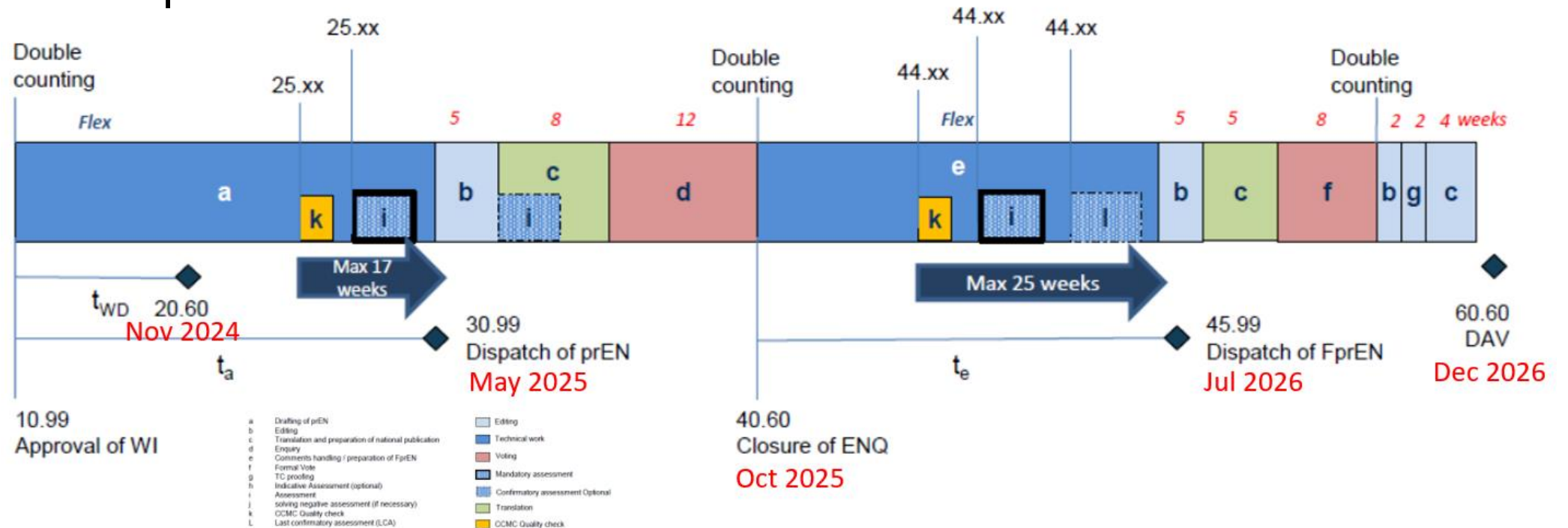
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- Commissioning and maintenance of a consumption point (EMS installed on-board)
- Hybrid trains: adding flags for other on-board source in use, charging/discharging batteries and possible extra measurement points in the ReadingBlock
- Reactive energy together with harmonics, reactive calculation methods, influence of ripple, verifying that components of different manufacturers really work together
- Passing neutral zones and phase separating areas
- Better stability of the clock
- Signature in CEBDBlock, location of error in reply messages (XPATH), secure layer protocols (SFTP and HTTPS), relation to standard on lower communication layers
- Multiple other improvements found by IEC group



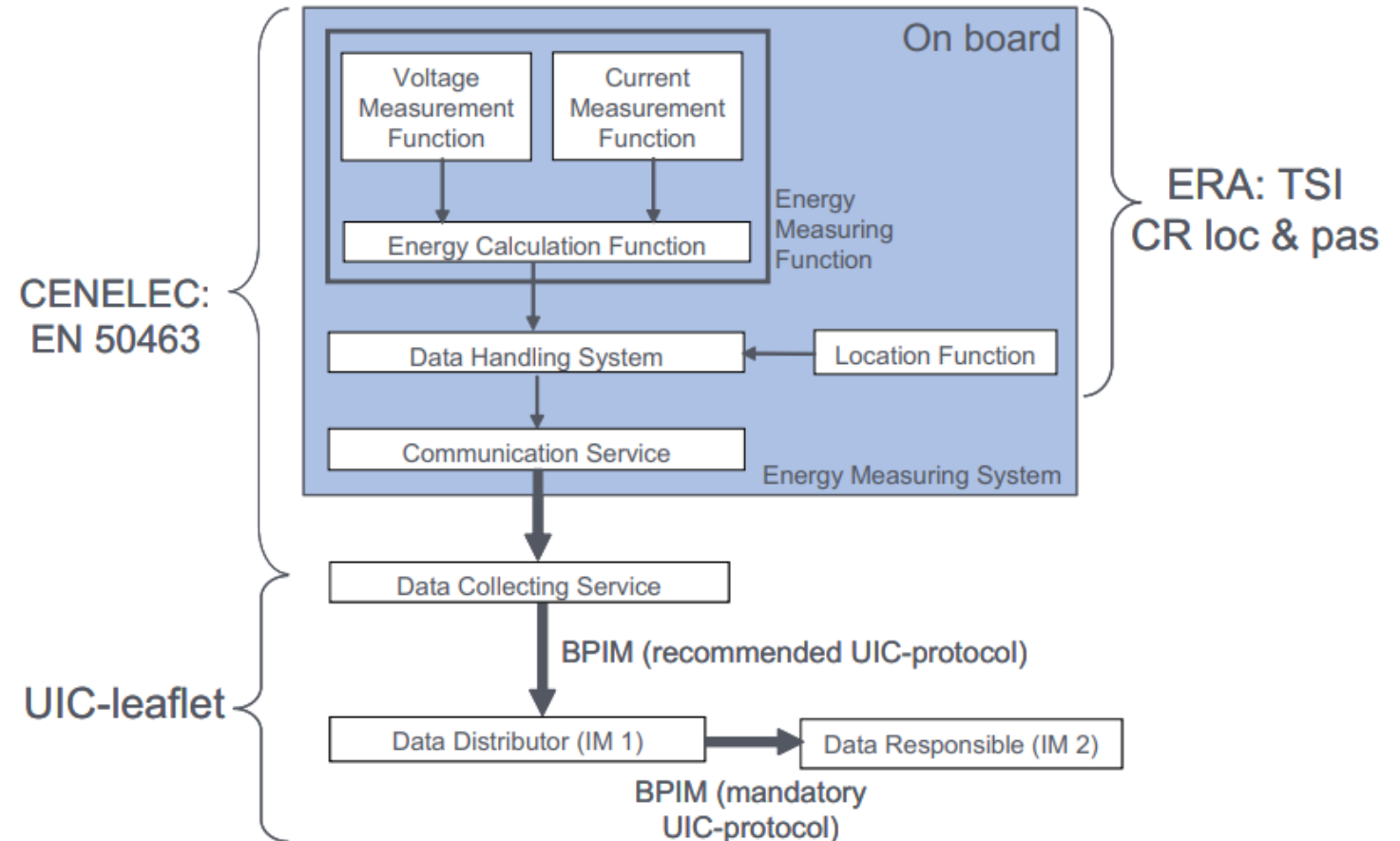
# I. EN 50463: planning

- November 2024: working draft ready
- August - October 2025: enquiry and voting
- September - October 2026: editorial commenting and voting on final draft
- December 2026: publication



## 2. IRS 90930: history

- October 2005: a conference at UIC in Paris resulted in the start of a WG
- September 2009: UIC published the first leaflet 930
  - EMS with location data
  - EMS sends data to one DCS
  - A data distributor splits the data based on location data (Exchange-function)
  - Polygons and border points
  - A standardised protocol



## 2. IRS 90930: from first publication to maintenance

- October 2015: first meeting of new WG
- October 2020: publication of IRS 90930
  - improved role model (adjusted to terms used in commission implementing regulation, TSI and EN 50463)
  - describing tasks and responsibilities
  - adjusting the EN 50463:2017-protocol for the use between actors on ground
  - freely available on UIC shop
- 2021-2023: 1<sup>st</sup> maintenance phase
- 2024-2026: 2<sup>nd</sup> maintenance phase



### Railway Undertakings:

1. RU will install EMS on all traction units where this is technically and economically feasible. This should result in 60% equipped in 2025 and 90% in 2030.
2. All EMS on new traction units shall be fully compliant with LOC&PAS TSI:2018. Non-compliances on retrofitted EMS shall be stated.
3. All new and renewed EMS shall send data to DCS at least every 4 hours and before intentional powering down.
4. RU shall be able to deliver to the IM train compositions by 2023. This shall be done preferably at departure of train-run.

### Infrastructure Managers:

1. IM shall provide DCS in accordance with ENE TSI:2018 latest in January 2022.
2. IM shall process data fast in DCS and exchange-function of Settlement and forward data without further delay in accordance with clause 5.4 of IRS 90930:2020.
3. International data exchanges will be in accordance with IRS 90930:2020.
4. IM enables a pragmatic approach to increase the possibilities of the RUs in the electricity purchasing strategy.
5. All relevant information is publically available.

## 2. IRS 90930: updates

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- Addendum 1 and 2: changes and clarifications agreed since publication of IRS 90930
- Appendix A
  - agreed file on how to communicate masterdata (describing EMS and traction unit on which it is installed)
  - starting with exchanging data with CSV via e-mail
  - migrating towards an automatic transfer with XMLs posted on SFTP sever
- Appendix E
  - application guide on how exchange function should function
  - extra guidance for the different subfunctions (validation, splitting at border points, allocating to different countries)
  - multiple examples
- Appendix D “polygons and border crossing points” has been updated since first publication
- Appendix G “error codes” updated

### 3. Hybrid trains

- Topic of the workshop on Eress Forum 2023
- Working group started to analyse all aspects
- September 2023 – Eress webinar presents first results of this working group
- November 2023 – Eress webinar presents the prTS 50729\* (interface to battery trains)
- June 2024 – Eress publishes a brochure with the results of the working group

\* The comments on the prTS 50729 have been handled. The final draft of this interface standard towards battery trains will be open for voting soon.



October 2021 Tübingen  
 VOLTAP – Furrer+Frey  
 15/25 kV 50 Hz – 2 x 1,2 MVA  
 © Stadtwerke Tübingen



Bi-mode electricity + diesel



Batteries on roof of EMU